RESEARCH REPORT

Navigant Research Leaderboard: IoT Platform Vendors

Assessment of Strategy and Execution for 15 IoT Platform Providers

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Section 1
EXECUTIVE SUMMARY

1.1 Market Introduction

Utilities and similarly large enterprises seeking to adopt Internet of Things (IoT) technologies rely on an ecosystem of vendors to help them harness the complex nature of these projects. Assistance is needed to manage an increasing number of connected devices and processes, handle the large data volumes they kick off, and then unlock valuable business insights through analytics tools.

As demand for IoT technology increases, many vendors have cobbled together IoT platforms as a foundational solution that promises to bring order, control, and economic advantages out of the chaos. The challenge for corporate managers is to sort through hundreds of vendors claiming IoT platform expertise and then decide the best fit for their particular needs, be that for an energy grid operator or a manufacturer of steel. The choices can be confusing and outcomes uncertain.

In spite of doubts around IoT platforms such as added costs, complexity, and uncertain outcomes, market demand for these solutions is on the rise as enterprises seek the latest digital tools to optimize their processes and better engage with customers. Some might have the resources to act on their own. Often, however, even large organizations lack the internal skills and tools necessary to integrate an IoT platform, particularly for data analytics and the continual need to stay ahead of potential cybersecurity attacks. Thus, there is a need for vendors that can fill the void with robust platforms in a still emerging market.

This *Navigant Research Leaderboard* evaluates 15 vendors offering IoT platforms relevant to utilities and other industries taking on digital transformation projects.

1.2 Vendor Selection

IoT platform vendors included in this analysis were selected based on their participation in the overall IoT market. The criteria by which solutions providers are compared in this *Navigant Research Leaderboard* include the following:

- Vision
- Go-to-Market Strategy
- Partners
- Technology
- Geographic Reach
- Sales, Marketing, and Distribution
- Solution Performance

- Product Portfolio

- Pricing

- Staying Power

Detailed descriptions of each criterion are provided in the "Criteria Definitions" section of this *Leaderboard*.

1.3 The Navigant Research Leaderboard Grid

The 15 vendors in this *Leaderboard* analysis are recognized as among the top competitors in the crowded IoT platform market. Four companies have achieved Leader status in this *Leaderboard*: Microsoft, Amazon Web Services (AWS), IBM, and PTC. Each offers a solution set and certain corporate strengths that outpace the rest of the group

Company profiles, found in Section 4, include an overview of each company's solutions and strategies for meeting demand for solutions in the IoT platform market, as well as an explanation of their relative ranking scores.

Chart 1.1   *The Navigant Research Leaderboard Grid*
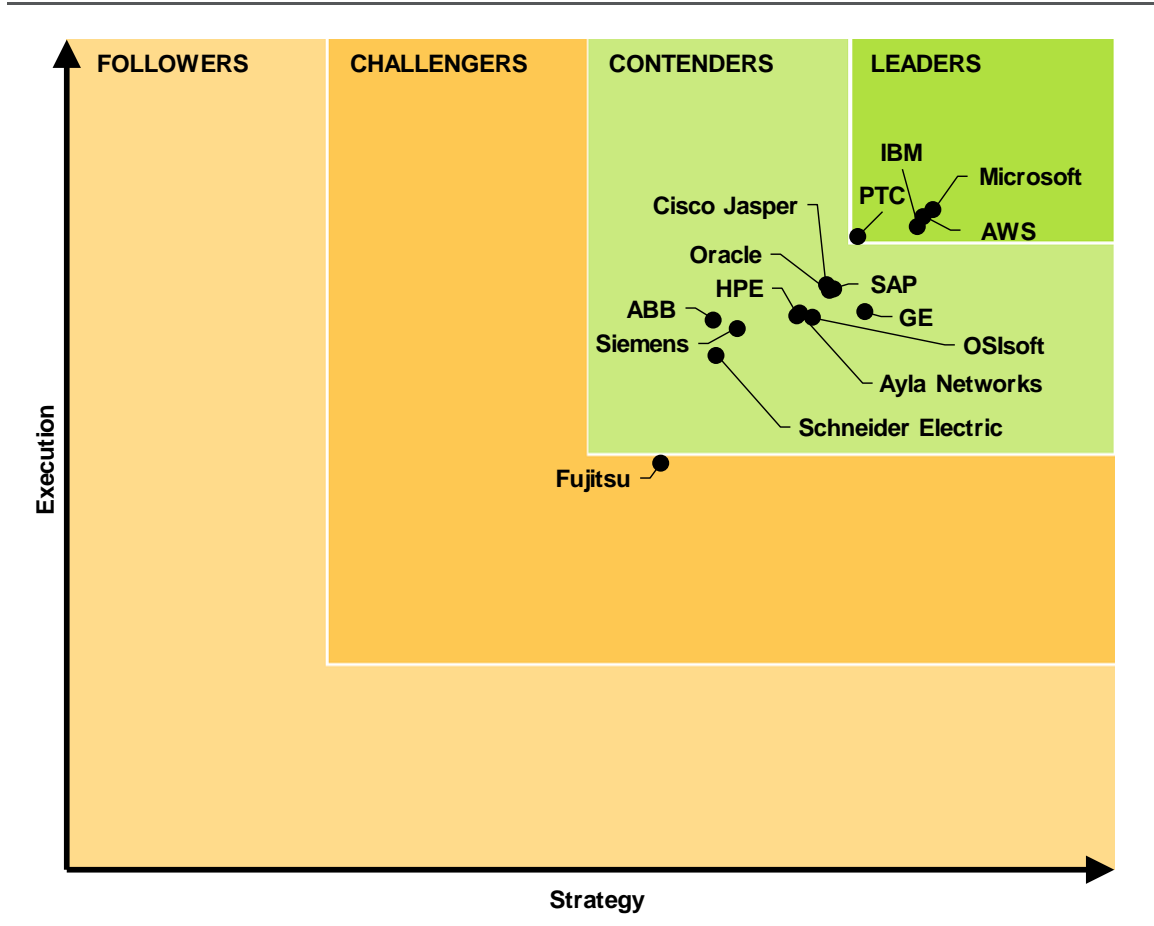
(Source: Navigant Research)

Section 2
MARKET OVERVIEW

2.1   Overview

Companies across multiple industries, including utilities, have Internet of Things (IoT) projects in place or pilots underway. Globally, about 3% of all corporations have completed this kind of project, according to a 2017 survey by SAP that queried some 3,000 corporate executives about their digital transformations, which encompass IoT technologies. In the same survey, 84% of the executives said digital transformation is critical in the next 5 years. Thus, the future for IoT is quite promising.

However, these companies face a problem. To take on significant IoT projects, companies need a digital platform to harness all the connected devices and the growing volumes of data. A reliable IoT platform can provide the necessary foundation for a successful launch and longer-term advantages. Despite vendor claims to the contrary, the problem at this relatively early market stage is no single IoT platform can cover the wide range of complex needs: connecting diverse devices, managing large datasets, and then extracting business value through analytics. Moreover, corporate executives must sift through dozens, if not hundreds, of vendors claiming to offer such a solution.

Despite the lack of comprehensive IoT platforms, over the next 3-5 years, the platforms should mature and the proven choices should become much clearer. Navigant Research expects IoT vendors and customers to resolve the many challenges of this emerging technology. For this *Leaderboard*, Navigant Research defines an IoT platform as:

> *Software and cloud solutions that provide device or connectivity management, data analytics, and support for developing applications that control, manage, and integrate things in an environment.*

2.2   Key Market Drivers and Barriers

The IoT platform market is part of the fundamental digital transformation taking place across all industrial sectors. In the energy space, IoT platforms are a key element of the emerging Energy Cloud (see Navigant Research's *Navigating the Energy Transformation* white paper). Beyond energy, IoT platforms are becoming vital to sectors such as transportation, manufacturing, agriculture, mining, and healthcare. In either case, the predominant market driver is greater efficiency and the specific drivers are similar:

- **More efficient use of energy:** Equipment that senses how it is operating in terms of energy use and makes intelligent adjustments (e.g., slowing down or turning off when rates are high) is inherently more energy efficient, leading to lower energy costs for the business. Connecting multiple sets of equipment across an organization and orchestrating their usage can drive even greater energy efficiencies as well.

- **Predictive, preventive maintenance:** Industrial machinery can last longer with sensors that continually monitor conditions and report when maintenance is necessary ahead of scheduled service or delay unneeded work, thus lowering costs. For instance, a grocery store with an IoT platform installed could receive alerts and accurate diagnostics hours or days in advance of when a specific chiller is about to fail, hence triggering precise maintenance work and preventing costly downtime and spoiled products. Advanced machinery can also act and react autonomously for maintenance purposes, thus eliminating or greatly reducing human involvement.

- **Competitive differentiation:** As leading companies deploy IoT solutions and gain efficiency, they can offer products and services at lower costs, thus separating themselves from competitors.

- **Transforming businesses, changing customer experiences:** Companies that deploy IoT solutions can transform their business, offering customers enhanced services, and more efficient, reliable operations. For example, a firm like elevator manufacturer Schindler has shifted its traditional business to a service model that integrates the internet to provide real-time equipment status, operational metrics, and personalized services for improved passenger experiences.

- **Falling component costs:** Over time, IoT components—sensors, chipsets, and networking gear—will tend to fall as volumes increase. As this occurs, more companies will be able to justify investing in IoT equipment to take advantage of the benefits associated with a deployment.

- **Falling data management costs:** Affordable data management solutions like Hadoop—an open-source software library that allows for processing large datasets— help move companies toward IoT deployments, since this is one area where operational costs can be reduced.

While market drivers are many and compelling, IoT platforms face significant hurdles:

- **Security threats:** Connecting hundreds, thousands, or millions of two-way communicating devices and sensors to corporate systems—not to mention the vast amounts of data involved—leaves devices and systems vulnerable to cyber attacks. Reported attacks against critical grid infrastructure heighten awareness and anxiety among potential adopters of the technology.

- **Added costs:** Even though device and sensor costs are expected to decline as volumes rise, the cost of both new IoT hardware and software can slow adoption by companies unable to afford the additional expense.

- **Uncertain ROIs and outcomes:** Since IoT technologies and platforms are relatively new and often untested by potential customers, the value of an investment is unclear, and managers have little or no experience that expected beneficial outcomes will truly come to pass. They have a distrust of reported ROIs.

- **Unfamiliar, untrained staff:** Many bright and technically trained people work across all industries, but few are prepared for the scale or complexity of IoT technologies and how to handle the avalanche of data. In time this issue will wane, but in the near term, it will remain an obstacle.

- **Complexity:** IoT platforms are complex. The potential volume of devices and data to manage can seem overwhelming. With most companies still in the planning or trial phase, it will take time and focus on steps toward simplification to overcome this.

- **Cloud-averse:** Much of the power behind the IoT comes from cloud-based services, where processing and storage can be affordably accessed and made useful at scale. Some industries, notably utilities, are slow to adopt new technologies like the cloud, and this reluctance will hinder IoT platform growth, at least for the near term.

2.3   Market Outlook

Navigant Research expects IoT platform demand to grow steadily through 2027 as utilities and companies across the industrial spectrum increasingly install connected devices and sensors, and then leverage those capital investments with software and services. Demand is expected to come from all sectors, including utilities, manufacturing, transportation, and commercial enterprises. North America, Asia Pacific, and Europe are expected to be the leading regions for IoT platform revenue growth.

The global market for industrial IoT software and service bundles is forecast to grow at a 29.4% compound annual growth rate from nearly $1.2 billion in 2017 to $15.3 billion in 2027. The market is expected to total a cumulative $77.4 billion between 2017 and 2027.

Chart 2.1   Industrial IoT Software and Service Bundles Revenue by Region, World Markets: 2017-2027
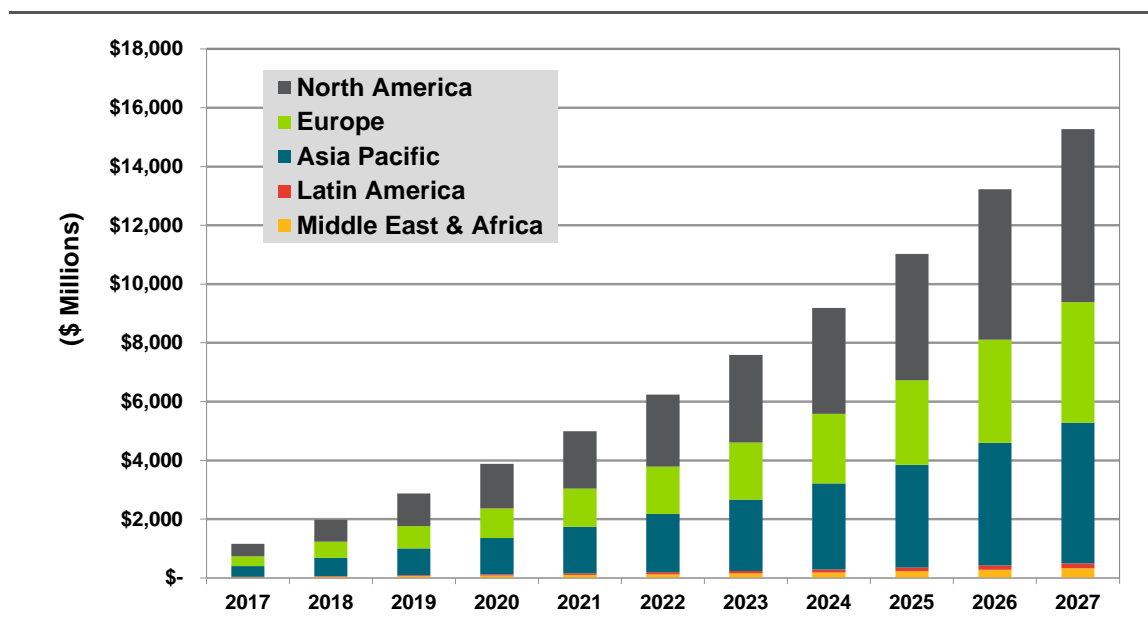
(Source: Navigant Research)

Section 3
THE NAVIGANT RESEARCH LEADERBOARD

3.1   The Navigant Research Leaderboard Categories

Navigant Research scored the vendors in this *Navigant Research Leaderboard* according to four categories: Leaders, Contenders, Challengers, and Followers. These categories are defined below.

3.1.1   Leaders

Leaders are vendors that scored 75 or above in both Strategy and Execution. These companies have clearly differentiated themselves from the competition through exceptional technology development, strong partner relationships, and a sustainable business model. Leaders are currently in the strongest position for long-term success in the IoT platform market.

3.1.2   Contenders

Contenders are vendors that scored between 50 and 75 in both Strategy and Execution. While these companies have a solid foundation for growth and long-term success, they have not attained a superior position in the market. They are well-positioned to become Leaders, but need to gain more traction through increased sales of their platform, as well as differentiate themselves with innovative or unique features or modules that set standards for best practices for broader adoption of IoT technologies going forward.

3.1.3   Challengers

Challengers are vendors that scored higher than 25 in Strategy and Execution but are not yet Contenders for market leadership. While vendors in this category are fundamentally sound, they face significant challenges stemming from a lack of strategic vision or investments, or risks to successful potential Execution. Challengers may also be early in their arc of new technology launches, therefore resulting in Execution scores that are based on smaller numbers of projects.

3.1.4   Followers

Followers are vendors that have failed to distinguish themselves and scored below 25 in Strategy and Execution. These companies are not currently expected to challenge the Leaders unless they can substantially alter their strategic vision and expand their resources. Their long-term viability is in doubt unless systemic changes are made within the organization. In this *Leaderboard*, no vendors ranked as Followers.

3.2   The Navigant Research Leaderboard Grid

The 15 companies included in this *Navigant Research Leaderboard* have established themselves as among the leading vendors in the emerging yet crowded IoT platform market. Given the large number of vendors competing here, Navigant Research chose to

rank companies that have made inroads across several industries, and not just energy. Some of these players are well established brands with global footprints, while others are lesser known but still relevant as the market evolves. Company profiles, brief overviews of each one's solutions, and explanations of the scoring for each can be found in Section 4.

Chart 3.1   The Navigant Research Leaderboard Grid
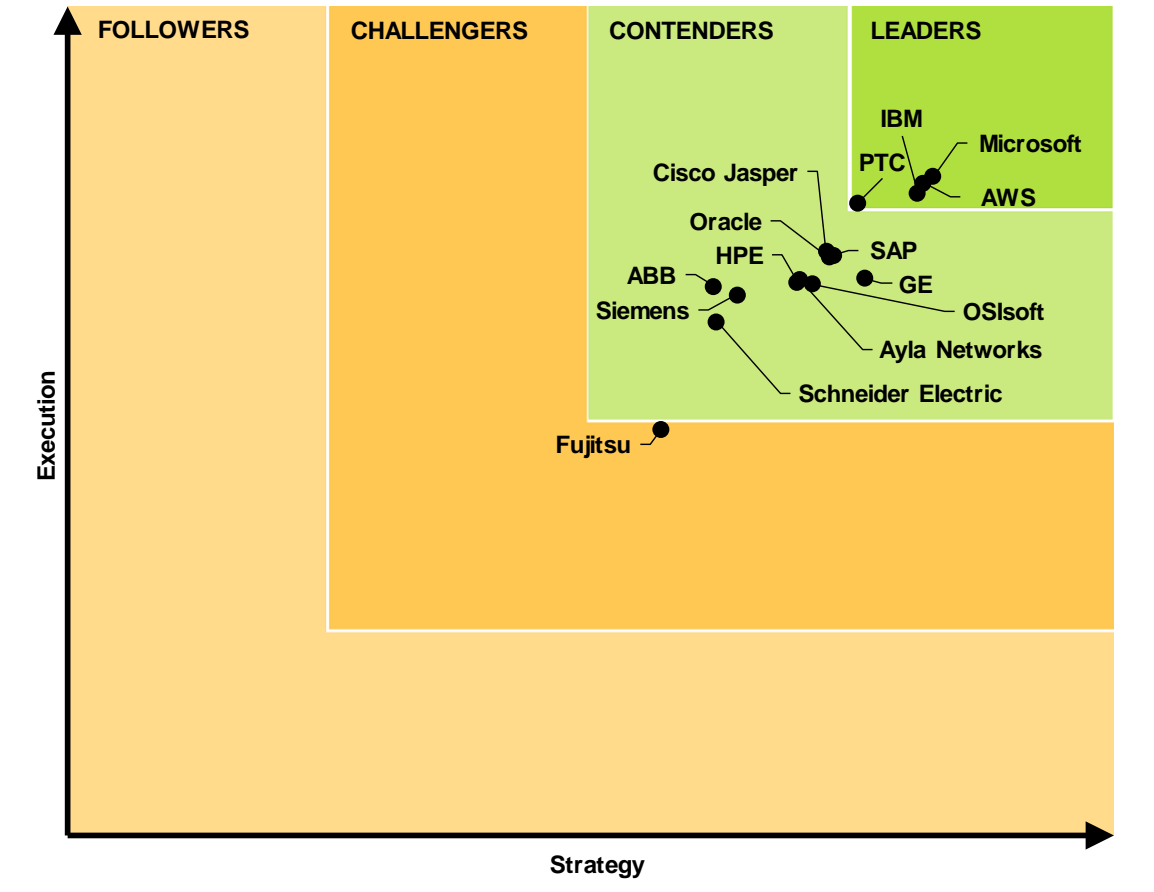
(Source: Navigant Research)

Table 3.1   ***The Navigant Research Leaderboard Overall Scores***

Rank	Company	Score
1	Microsoft	81.1
2	Amazon Web Services (AWS)	80.3
3	IBM	79.4
4	PTC	75.9
5	General Electric (GE)	71.9
6	SAP	71.6
7	Cisco Jasper	71.5
8	Oracle	71.3
9	OSIsoft	68.9
10	Ayla Networks	68.5
11	HPE	68.3
12	Siemens	64.6
13	ABB	64.0
14	Schneider Electric	62.0
15	Fujitsu	53.0

(Source: Navigant Research)

Section 4
COMPANY RANKINGS

4.1   Leaders

To qualify as a Leader, a company must score 75 or higher in both Strategy and Execution. This *Navigant Research Leaderboard* features four Leaders: Microsoft, Amazon Web Services (AWS), IBM, and PTC.

4.1.1   Microsoft

Overall Score: 81.1

Strategy: 82.8

Execution: 79.5

Microsoft was founded in 1975 and is headquartered in Redmond, Washington. Microsoft operates in over 190 countries and has 114,000 employees. In 2016, the company generated $85.3 billion in revenue. Revenue from its commercial Azure cloud solution and its IoT platform showed significant growth over the past year.

Microsoft's Azure IoT Suite is noted for its enterprise cloud computing capabilities, and earns high marks for its focus on its real-time data analytics functionality, and its broad suite that starts with its IoT Hub offering aimed at connecting and monitoring large numbers of devices. The company's platform also features the ability to extend to edge devices, and can incorporate machine learning and artificial intelligence capabilities for customers seeking to leverage those technologies.

Several other aspects of Microsoft's platform buttress its rank as a Leader, including its flexible hybrid cloud, open ecosystem design and extensive industry focus, which includes these verticals: professional services, discrete manufacturing, retail, education, government, healthcare, and banking. The platform and the Azure cloud also feature strong security capabilities; notably, the US government recently approved Azure for hosting classified-level applications. Microsoft also benefits from key partners that are part of its Azure Certified for IoT program such as Dell, HPE, Intel, Fujitsu, Texas Instruments, and Freescale. The software giant continues to enhance its platform; for example, via its purchase of Solair in 2016 to take advantage of the Italian firm's IoT services in several key verticals such as manufacturing, retail, and transportation. Like other companies in this *Leaderboard*, Microsoft's platform is still evolving. For now, it has one of the more complete solutions.

www.microsoft.com

Chart 4.1   Microsoft Strategy and Execution Scores
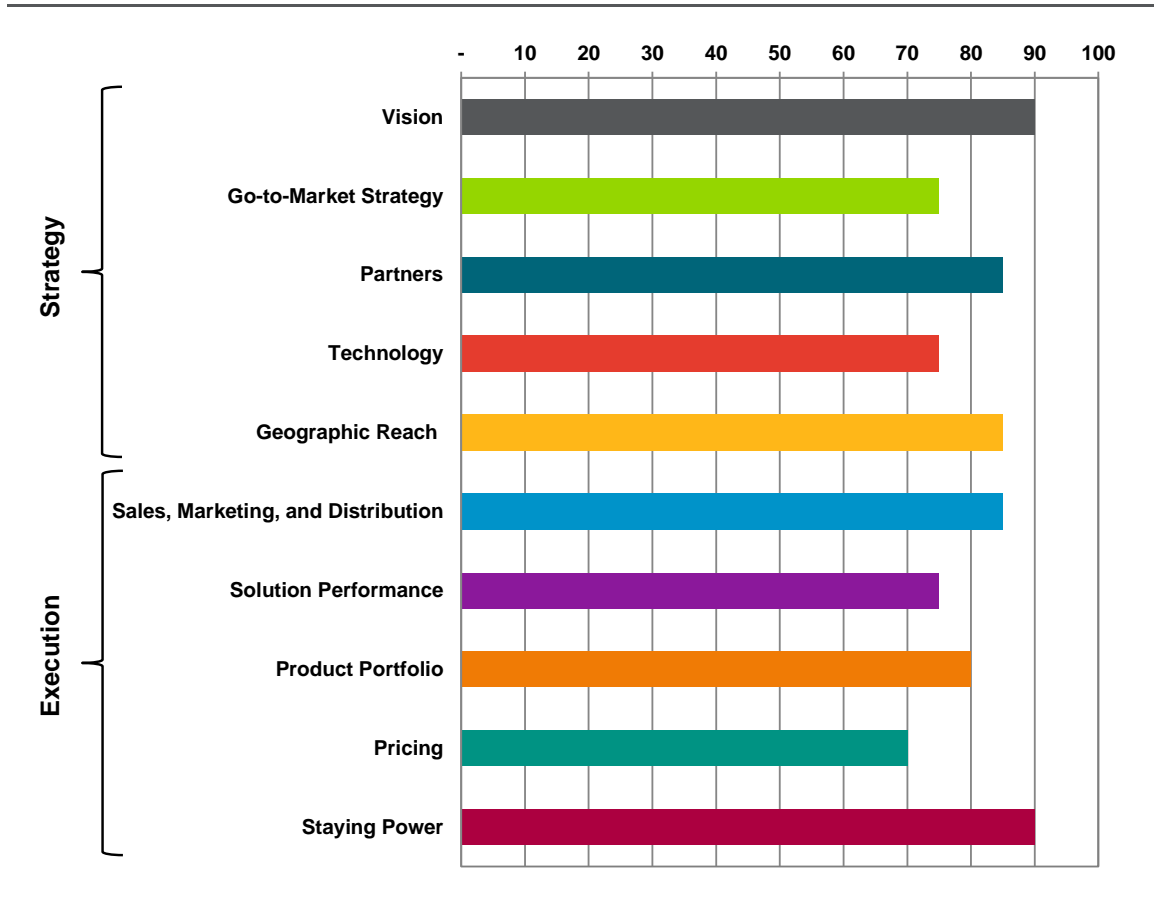
(Source: Navigant Research)

4.1.2   Amazon Web Services

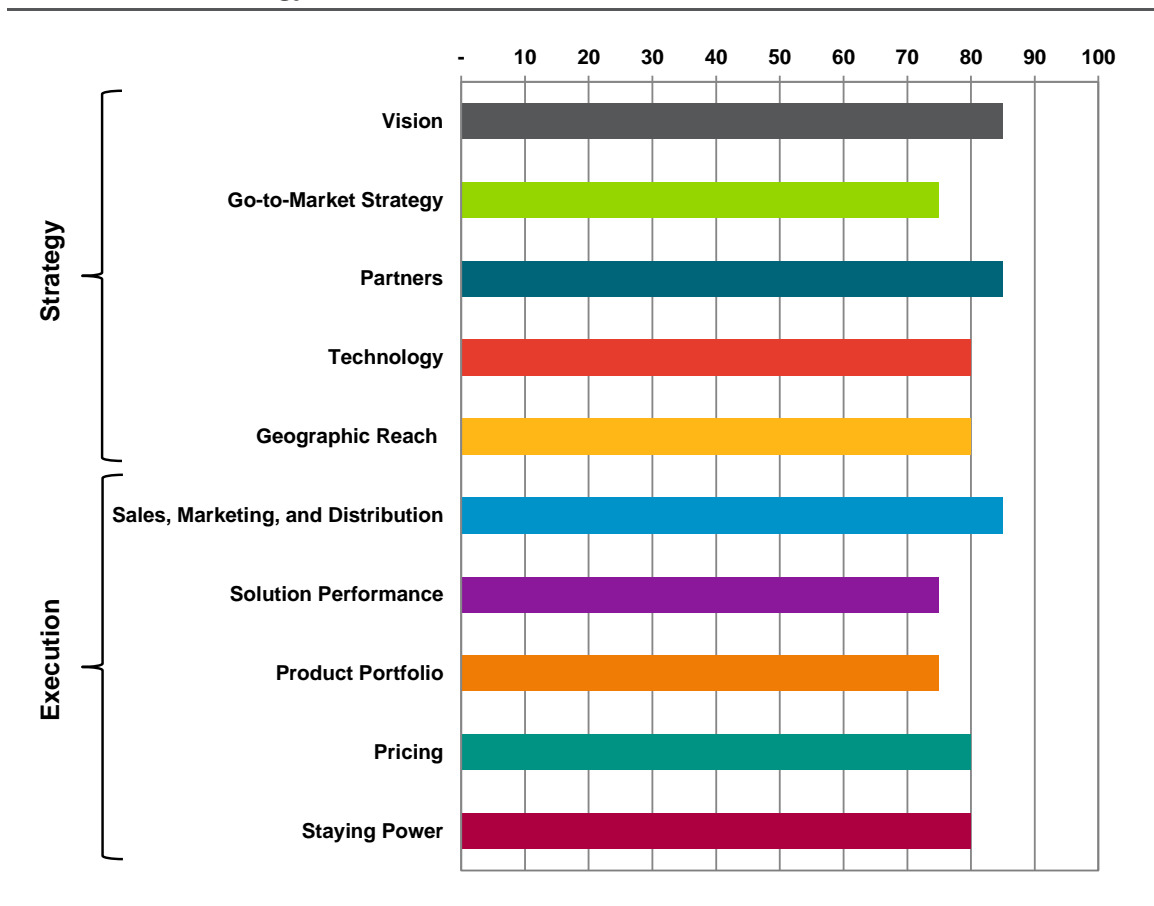*Overall Score: 80.3*

Strategy: 81.8

Execution: 78.8

Amazon is a leading online retail and services business that was founded in 1994. The Seattle, Washington-based publicly traded firm employs more than 540,000 people globally. The company posted nearly $136 billion in annual revenue. The company's Amazon Web Services subsidiary, widely known as AWS, was founded in 2006, and provides cloud-based IT infrastructure services to businesses. Its products and solutions include cloud computing, compute, networking, storage and content delivery, databases, analytics, application services, deployment and management, mobile services, applications. The company's IoT platform was launched in 4Q 2015.

The AWS IoT Platform is a cloud-based solution that features device connectivity and data assimilation services that can scale for large IoT projects. The platform ranks near the top of this *Leaderboard* for several key reasons, including its device security and management features and its ability to analyze important device data for actionable insights. The company's pricing model is noteworthy as well, allowing customers to purchase what they need as they scale an IoT deployment. AWS' position is further cemented by its strong global market presence, vision, and partners, which include Intel, Nokia, and PTC. AWS' arsenal lacks on-premise capabilities, which can be a hurdle in some industry sectors such as utilities, though that is shifting as cloud services become more accepted.

www.amazon.com

Chart 4.2 AWS Strategy and Execution Scores

(Source: Navigant Research)

4.1.3   IBM

Overall Score: 79.4

Strategy: 81.3

Execution: 77.5

IBM, headquartered in Armonk, New York, is a global provider of IT hardware and software products and services. The company employs about 380,000 globally. In 2016, the company generated $79.9 billion in revenue.

IBM's Watson IoT platform is a Leader in this analysis in part because of its strong vision for Watson, its overall strategy, and technical expertise. The platform is noted for its cognitive learning capabilities, ease of use, and analytics in the cloud or at the edge of connected networks. Watson can also handle large and varied datasets and return useful insights for customers. One of the key features is allowing users to access skills via IBM's cloud through application program interfaces (APIs) that enable servers to understand human conversations.

The platform also enables the rapid deployment of applications, and has the tools for implementing innovative processes such as blockchain for supply management and payments. Though IBM's platform is among the Leaders and has won clients in various sectors such as healthcare, media, and retail, it has had some struggles making inroads in the manufacturing and energy sectors. Nonetheless, the company has shown some recent momentum. Revenue from its overall cloud service business was up 20% in 3Q 2017 compared to a year earlier, which likely includes sales for its IoT platform.

www.ibm.com

Chart 4.3   IBM Strategy and Execution Scores
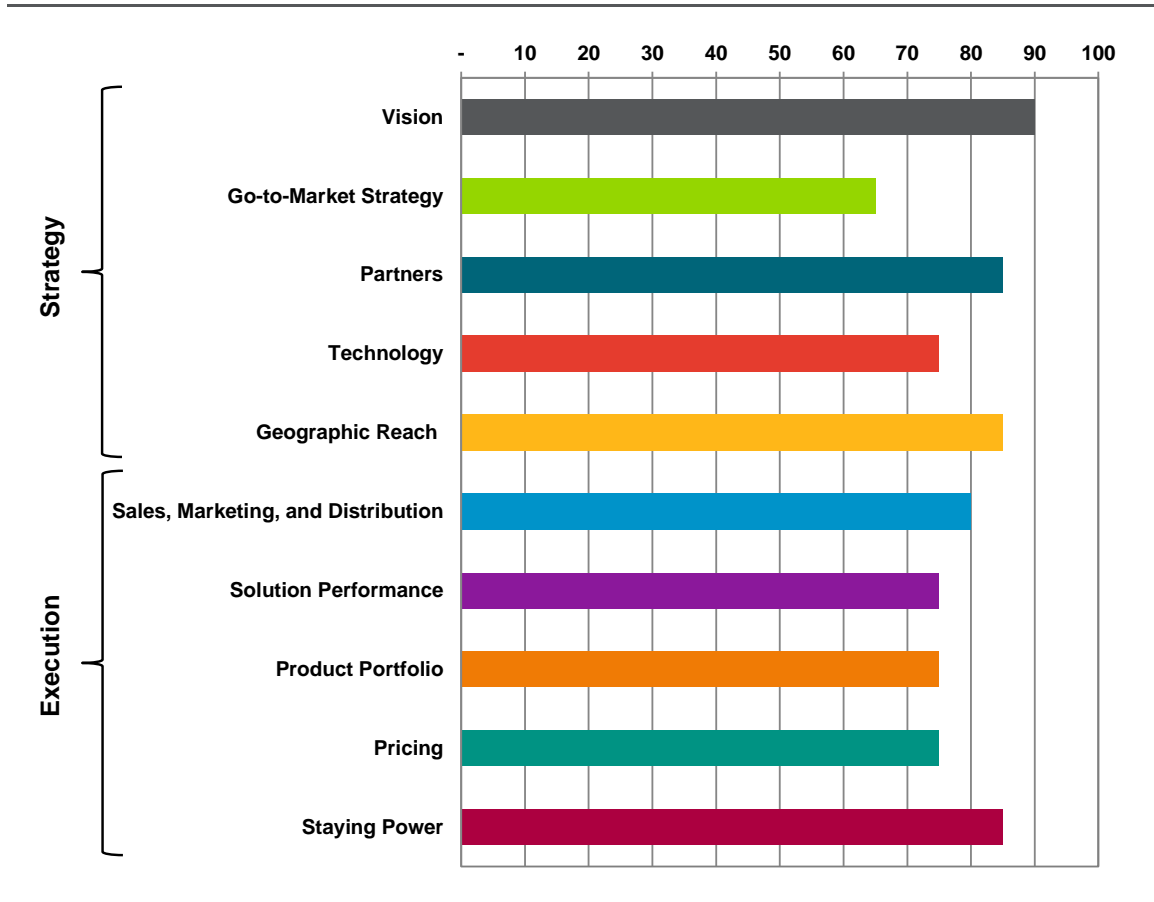
4.1.4   PTC

Overall Score: 75.9

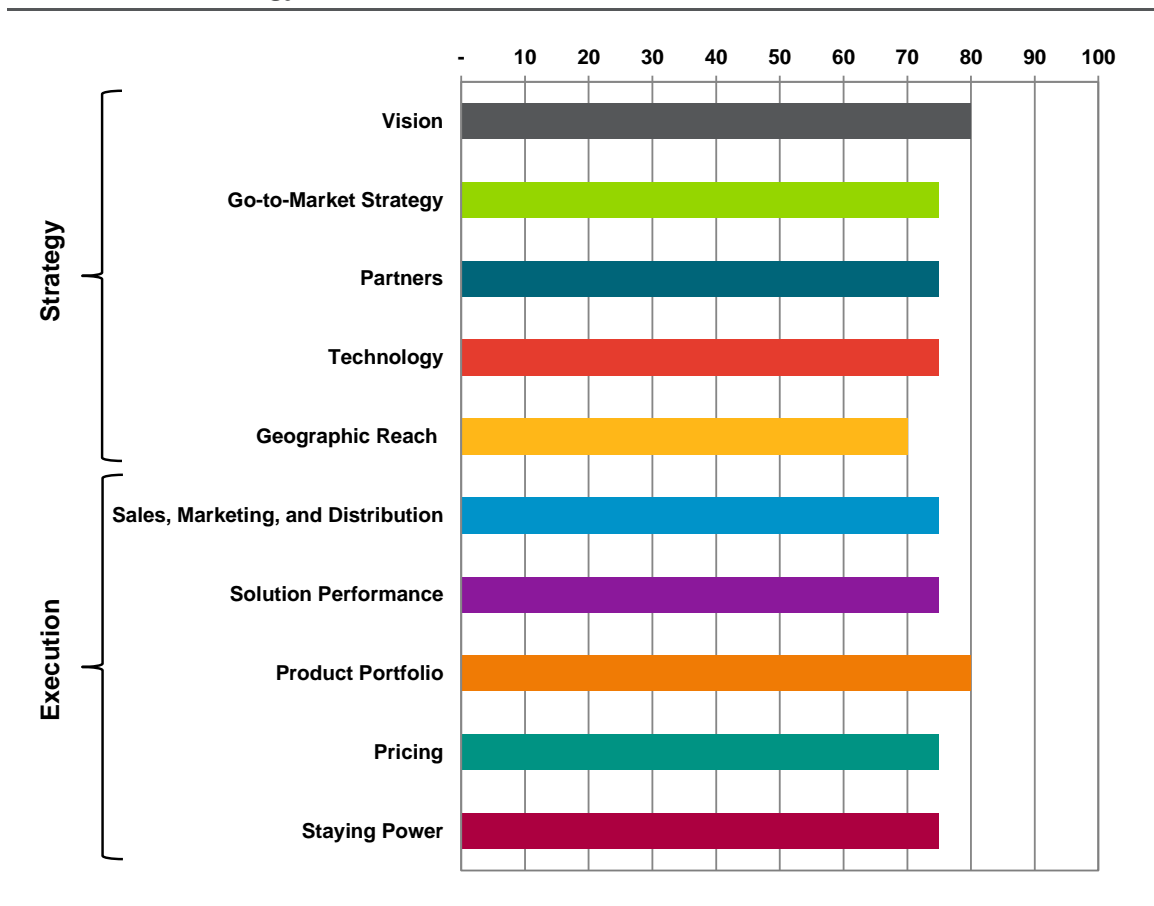*Strategy: 75.5*

Execution: 76.3

PTC is a software and services company founded in 1985. Based in Needham, Massachusetts, PTC employs approximately 6,000 people. The company generated nearly $1.2 billion in revenue for its fiscal year ending September 30, 2017.

The company's ThingWorx IoT platform features a set of robust components that start with Foundation as the hub. Foundation enables essential applications including connectivity, data management, and basic analytics. The remaining components are: Utilities for device management and systems integration; Analytics for advanced analytics; Studio for augmented reality; and Industrial Connectivity for process automation.

PTC's platform and overall approach to the IoT market earn it a rank of Leader in this analysis, though the company lacks the size or brand power of others in this category. The company's vision, technology, and solution performance are what stand out, and the lack of a commitment to a single cloud platform enables customers to make their own choices. PTC has made significant investments which help it rank in the top group, particularly its purchase of Kepware Technologies in 2016. In addition, it can leverage partners like HPE, Intel, or Accenture to enhance its standing. To remain a Leader, though, the company will need to continue to improve its platform with innovative capabilities, otherwise nearby Contenders could overtake it in a short timeframe.

www.ptc.com

Chart 4.4   PTC Strategy and Execution Scores

(Source: Navigant Research)

4.2   Contenders

To rank in the Contenders category, a company must score above 50 but below 75 in both Strategy and Execution. This Contenders group is crowded, indicating just how competitive the IoT platform market has become. Within this *Leaderboard*, 10 companies are

considered Contenders: GE, SAP, Cisco Jasper, Oracle, OSIsoft, Ayla Networks, HPE, Siemens, ABB, and Schneider Electric.

4.2.1 GE

Overall Score: 71.9

Strategy: 76.3

Execution: 67.3

Founded in 1892, General Electric (GE) is headquartered in Boston, Massachusetts and has approximately 295,000 employees. The company posted $123.7 billion in 2016 revenue, of which 43% was generated in the US. The industrial giant competes in numerous segments, and has the following divisions: Power, Renewable Energy, Baker Hughes (oil & gas), Aviation, Healthcare, Transportation, Energy Connections, Lighting, Digital, and Current.

GE's Predix IoT platform emphasizes real-time device and data monitoring the enables customers to see what is happening with connected assets and take appropriate action as warranted. Predix is built on Pivotal's Cloud Foundry technology, which functions as an open-source platform as a service (PaaS), and features important descriptive, predictive, and prescriptive analytics capabilities. The platform's architecture is designed to allow rapid development of applications at scale, reducing time and costs for customers.

Though the firm has been a strong advocate of enterprise digital transformation and IoT technologies for some time, GE ranks as only a Contender in this analysis mainly due to a lack of Execution relative to competitors. Earlier in 2017, it paused to fix issues with its software and retreated from targeting all industries; instead, it plans to focus on energy, aviation, and oil & gas. To become a Leader, GE will need to continue to improve its product and gain wider traction with solutions that deliver results that match or outperform fast-moving competitors.

www.ge.com

Chart 4.5   GE Strategy and Execution Scores
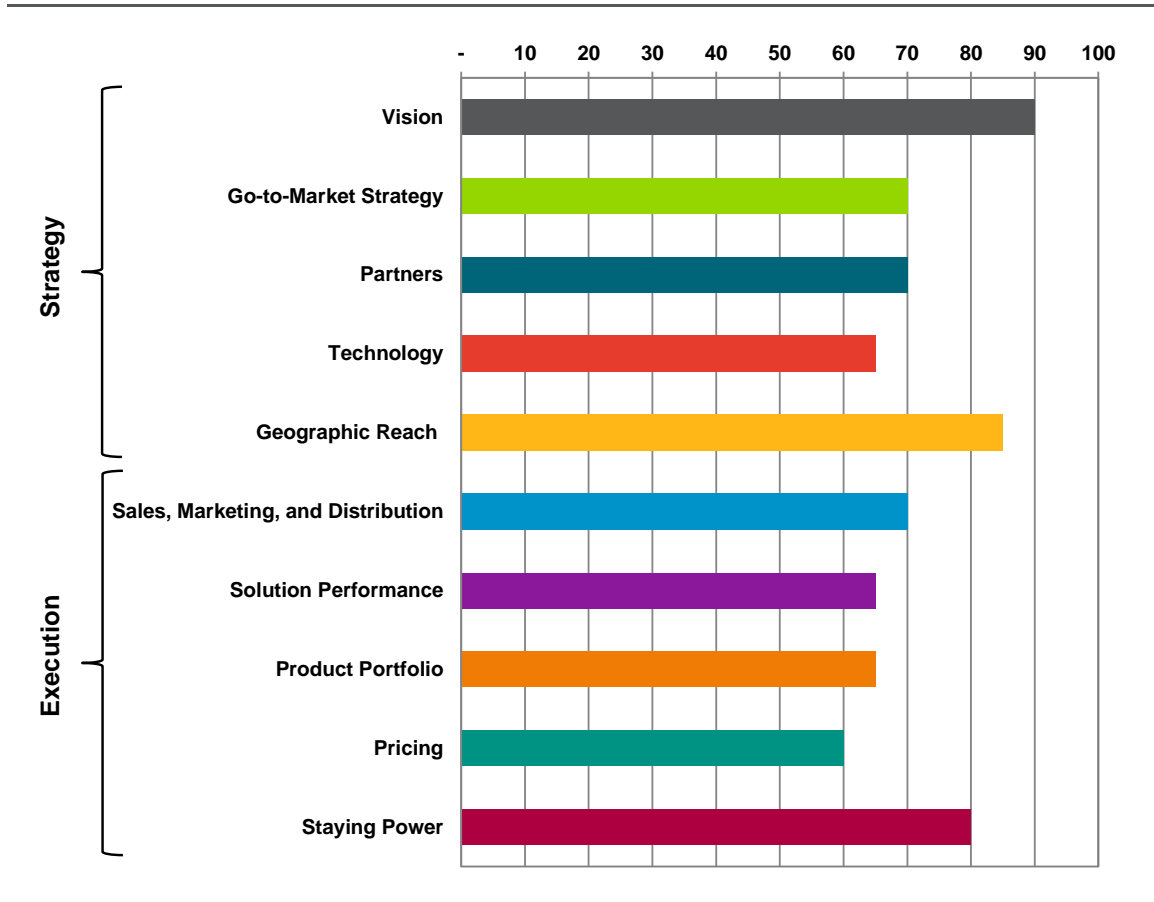
(Source: Navigant Research)

4.2.2   SAP

Overall Score: 71.6
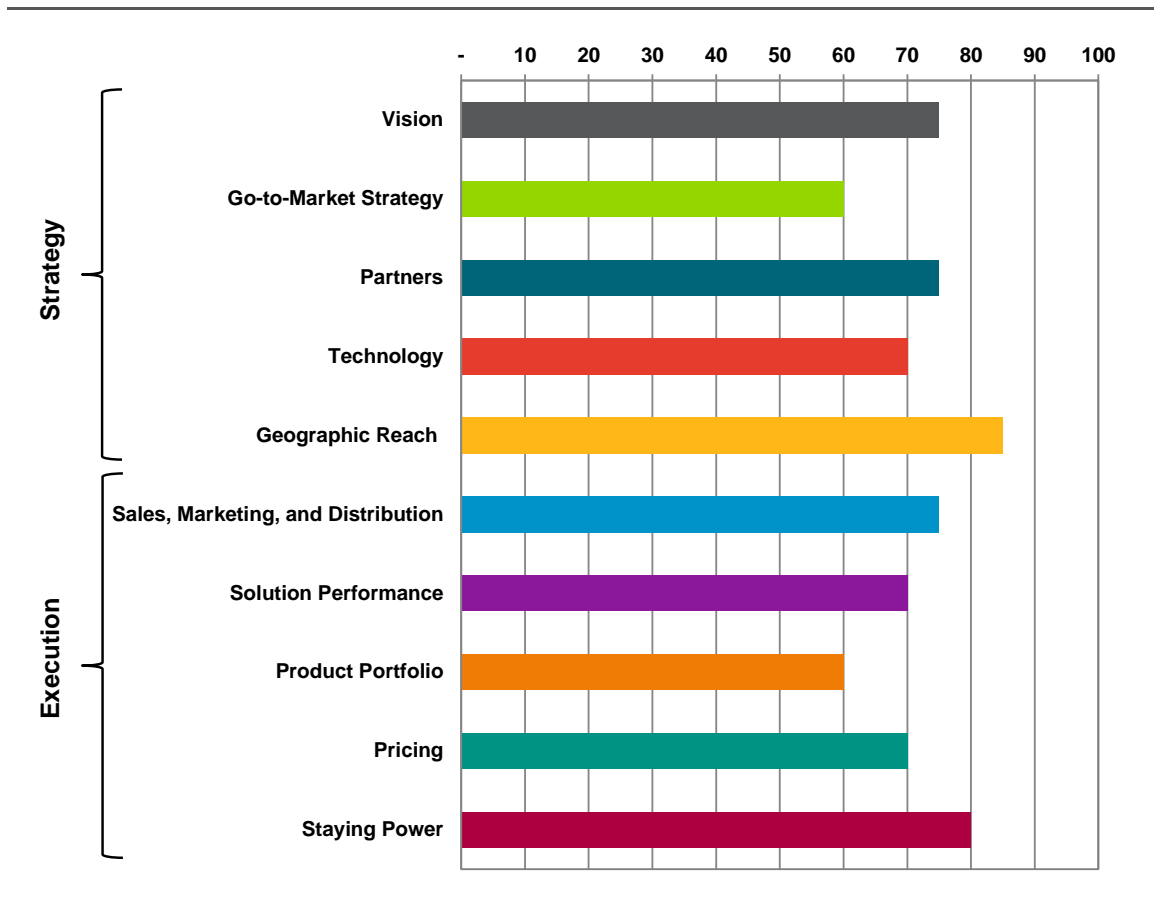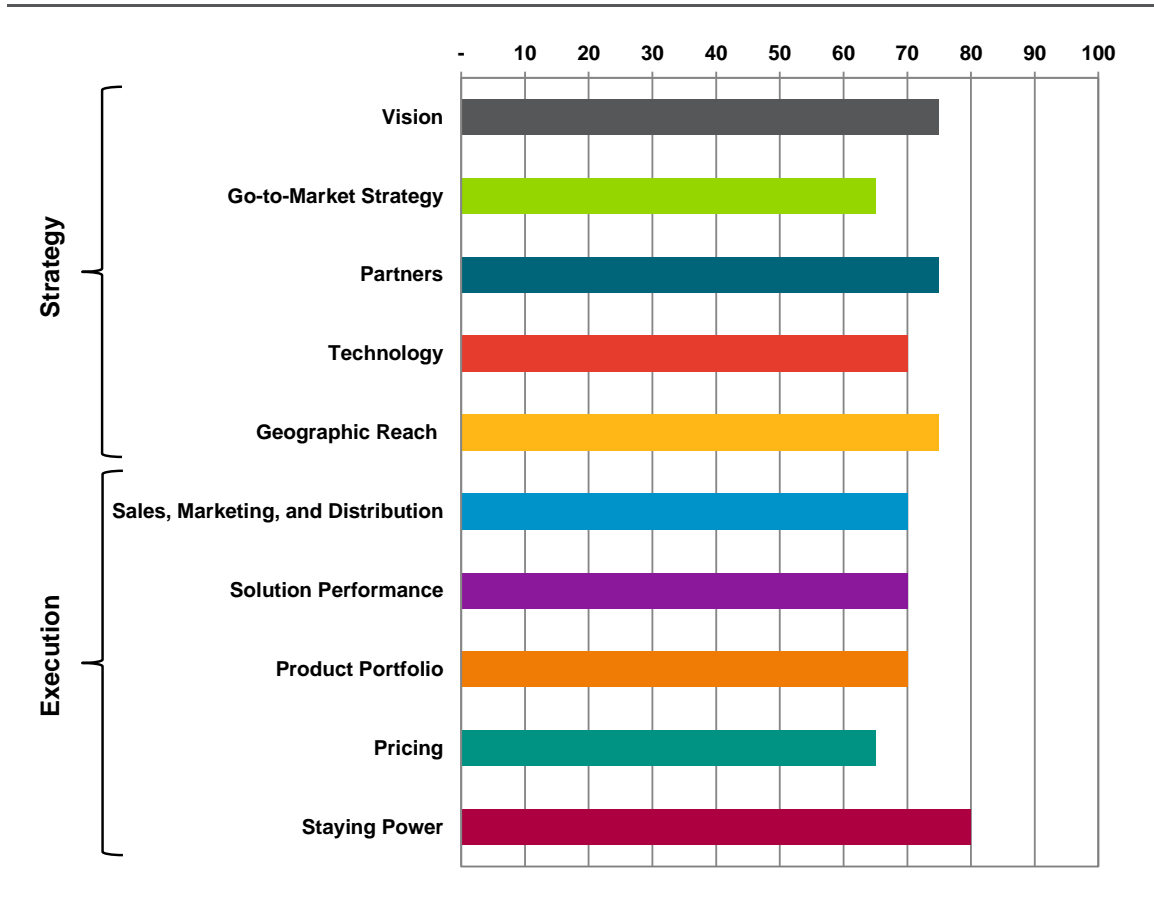
Strategy: 73.3

Execution: 70.0

Headquartered in Walldorf, Germany, SAP is a global provider of enterprise application software. The company, founded in 1972, offers software for a wide range of industries, including finance, human resources, manufacturing, marketing, sales, and supply chain. The company is best known for its ERP-integrated software, and is known in this space for its billing and financial applications. SAP reported revenue of nearly $21 billion for 2016; it employs more than 84,000 people globally.

SAP's Leonardo IoT platform is made up of various SAP technologies, and acts as an umbrella under which customers choose to integrate their processes. For example, the solution features building blocks of software that encompass big data, machine learning, data analytics, and blockchain. These capabilities are delivered mainly via the cloud, but

the platform also integrates with SAP's Hana database. The overall aim is for Leonardo to be an intelligent and open suite of applications that helps business customers solve issues and realize their intended outcomes. SAP ranks near the top of the Contenders in this analysis for its product integration, strong partnerships (with firms like IBM, HP, Intel, OSIsoft, and Itron), and vision for the IoT. The company has a strong global presence among enterprises, and could move into the Leader category if it can sharpen its go-to-market strategy and gain a bit more traction among customers compared to the current leading competitors.

www.sap.com

Chart 4.6   SAP Strategy and Execution Scores

(Source: Navigant Research)

4.2.3   Cisco Jasper

Overall Score: 71.5

Strategy: 72.5

Execution: 70.5

Cisco is a global provider of networking infrastructure, systems, and services headquartered in San Jose, California. The company employs more than 72,000 people globally. It reported revenue of $49.2 billion in fiscal year 2016. In March 2016, the company finalized its acquisition of Jasper, a cloud-based software firm, for $1.4 billion, a move aimed at strengthening Cisco's IoT platform.

The company's IoT Kinetic platform features three main capabilities: connecting devices across enterprise networks, managing distributed data quickly, and securely controlling the movement of data. The platform consolidates several functions under one roof, Connection Management, Fog Computing, and Data Delivery. Cisco's Kinetic strategy focuses on manufacturing, retail, oil & gas, transportation, and smart cities. The company relies on partners that integrate cloud services and analytics with Kinetic; these partners include Microsoft, Amazon, IBM, and SAP. The company ranks as a Contender in this analysis for its vision for IoT technology, key partners, and staying power. To become a Leader, Cisco will need a more complete set of software and services that complement its strong device and data connection capabilities.

www.jasper.com

Chart 4.7   *Cisco Jasper Strategy and Execution Scores*

4.2.4   Oracle

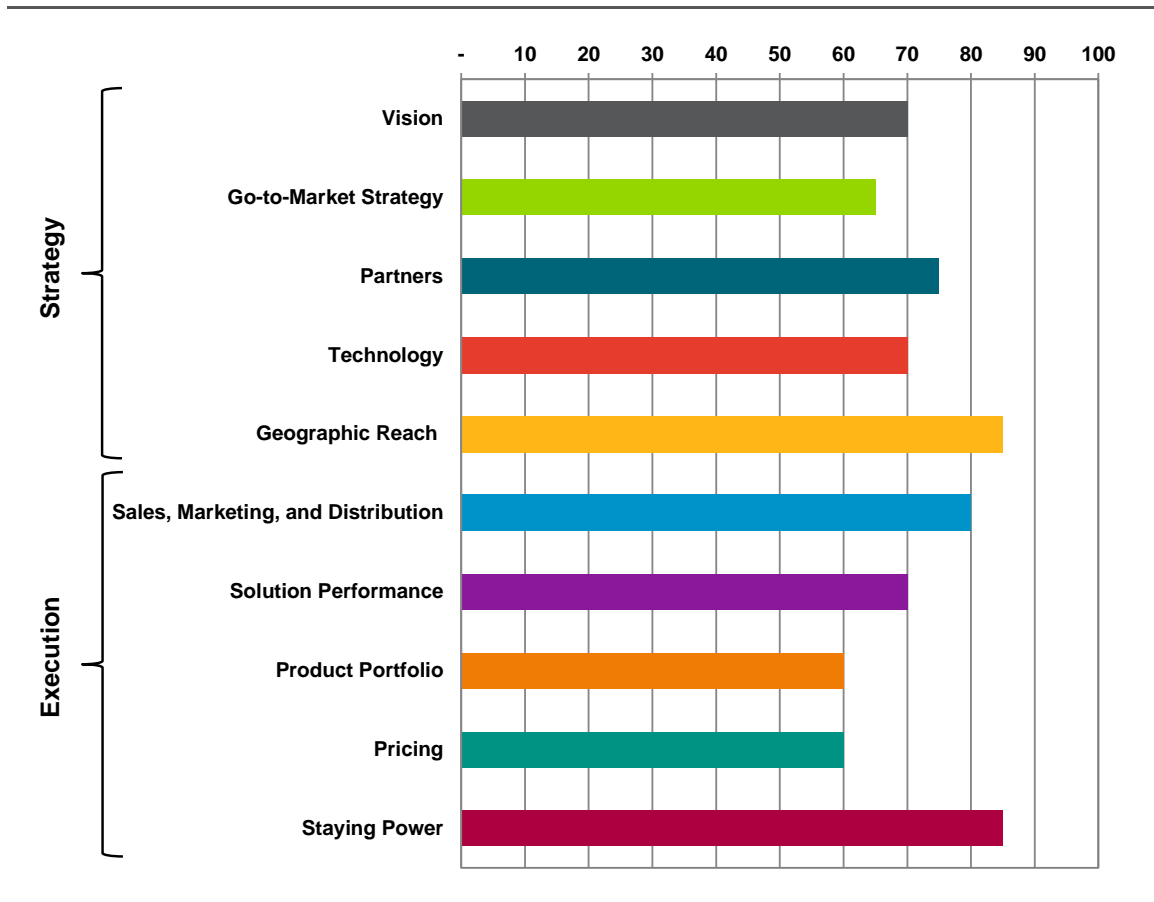*Overall Score: 71.3*

Strategy: 72.8

Execution: 69.8

Oracle, headquartered in Redwood City, California, is an enterprise software and IT company with revenue of $37 billion for fiscal year 2016. It employs more than 138,000 people globally. Oracle's Utilities business segment, which was founded in 1979, offers comprehensive software for utilities that spans the entire utility value chain, including customer service and engagement, metering, operations, asset management, and data analytics.

Oracle's IoT platform relies on its cloud solution that features digital twin, digital thread, artificial intelligence, machine learning, and automation capabilities. Key enterprise applications include asset, fleet, and production monitoring. Oracle counts on an array of device and systems integration partners for its platform's performance; among these are

Intel, Cisco, Bosch, OSIsoft, and Honeywell. Oracle is a Contender in this study for its technology, strong partners, and its staying power as a global software giant. However, to become a Leader, it will need to continue to add innovative features to its platform and demonstrate stronger performance in the execution of its IoT strategy.

www.oracle.com

Chart 4.8   *Oracle Strategy and Execution Scores*

(Source: Navigant Research)

4.2.5   OSIsoft

Overall Score: 68.9

Strategy: 71.3

Execution: 66.5

Founded in 1980, OSIsoft is a privately held enterprise software infrastructure provider based in San Leandro, California. OSIsoft is a well-known brand for industrial control systems. It serves markets both directly and through OEM relationships. In the energy sector, its control system expertise is used in generation, transmission, distribution, meter

data aggregation, and among independent system operators and regional transmission organizations.

OSIsoft's IoT platform is based on its Pi database, which collects real-time operational data from a variety of sources, then ingests the data, analyzes it, and then links it to enterprise applications. The approach is to be agnostic about data sources, and the aim is to integrate with services from SAP, Microsoft, or GE, among many others. The key to the platform is the ability to pool data and then distribute it where it can be used for business benefits in multiple use cases. OSIsoft is a Contender in this analysis for its robust technology, including embedded grid edge software, strong integration capabilities, and partnerships. To become a Leader, the company will need to keep improving its processes and skills to keep pace with current leading competitors, and broaden its geographic reach and marketing efforts.

www.osisoft.com

Chart 4.9   OSIsoft Strategy and Execution Scores
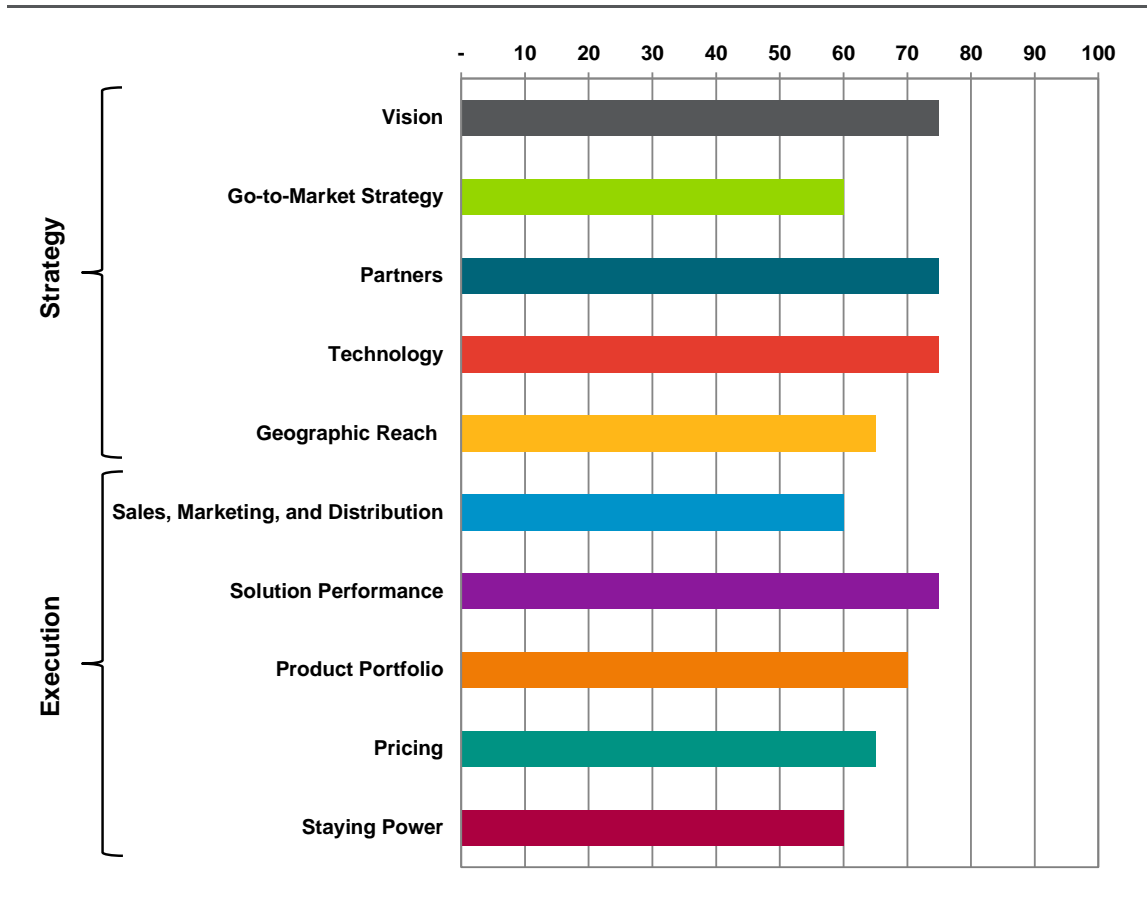
(Source: Navigant Research)

4.2.6   Ayla Networks

Overall Score: 68.5

Strategy: 70.0

Execution: 67.0

Founded in 2010, Ayla Networks is based in Santa Clara, California. The privately held company's main product is its IoT platform, which is designed to help customers accelerate IoT deployments. Ayla has raised more than $64 million from venture capital firms and strategic investors.

Ayla's Agile IoT Platform acts as a software foundation on which device manufacturers can build smart, connected products that are cloud-connected. The platform has three main components: embedded agents, cloud services, and application libraries. It also features tools and services for customers to manage and analyze their IoT deployments. Though still relatively small, the company has partnered with larger market players such as AWS, Qualcomm, and Marvell. Also, it has established a beachhead in China, notably as a partner of telecom China Unicom and of leading internet service provider Tencent. To reach Leader status, Ayla must make further technological advancements in its platform to meet what competitors offer in terms of analytics and machine learning capabilities. It needs to also up its marketing game and seek more partners that can help move it past other strong Contenders in this market.

www.aylanetworks.com

Chart 4.10   Ayla Networks Strategy and Execution Scores
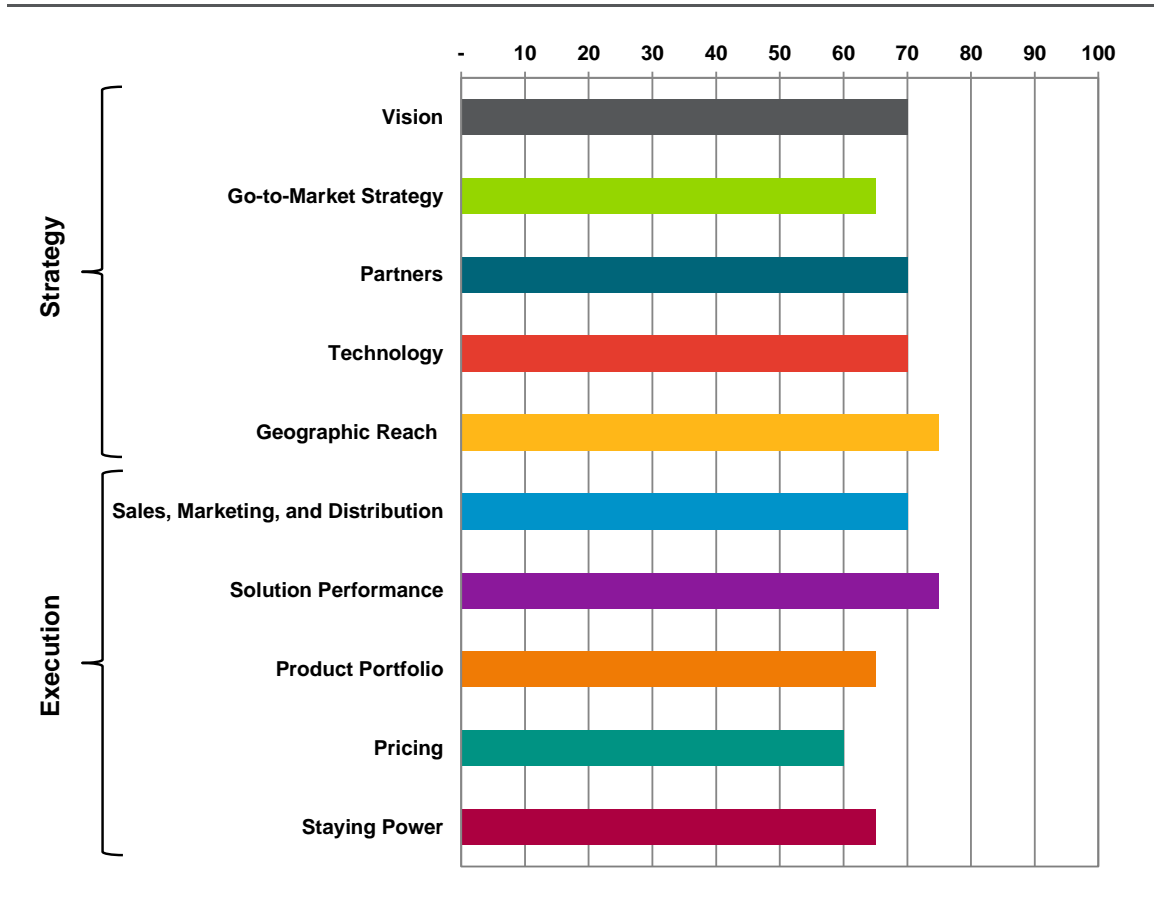
4.2.7   HPE

Overall Score: 68.3

Strategy: 69.8

Execution: 66.8

HPE is a global enterprise IT provider that was founded in 2015 when it was part of the split from the Hewlett-Packard company. Its headquarters are in Palo Alto, California. HPE had annual revenue of $50.1 billion for its 2016 fiscal year. It employs about 50,000 people globally.

HPE's Universal IoT Platform is designed as a scalable, single-vendor solution that manages diverse devices and vertical applications. Key features include data acquisition, verification, application integration, analytics, on-premise services, and cloud services. For industry verticals, HPE offers what it calls value packs, which are HPE-built solutions for customers who—for instance—focus on connected cars, waste management, smart lighting, smart campuses, or location based services. The platform also enables customers

to securely run applications from different verticals, which can be tailored to unique use cases.

HPE is a Contender in this analysis due to its product portfolio, strong partners, and geographic reach. However, it must seek more innovation for its platform to set it apart, drive a stronger marketing message, and demonstrate key wins among enterprise customers to move up in this *Leaderboard*. It seems to have the necessary pieces in place for such an upward move, but now it must execute better.

www.hpe.com

Chart 4.11   HPE Strategy and Execution Scores
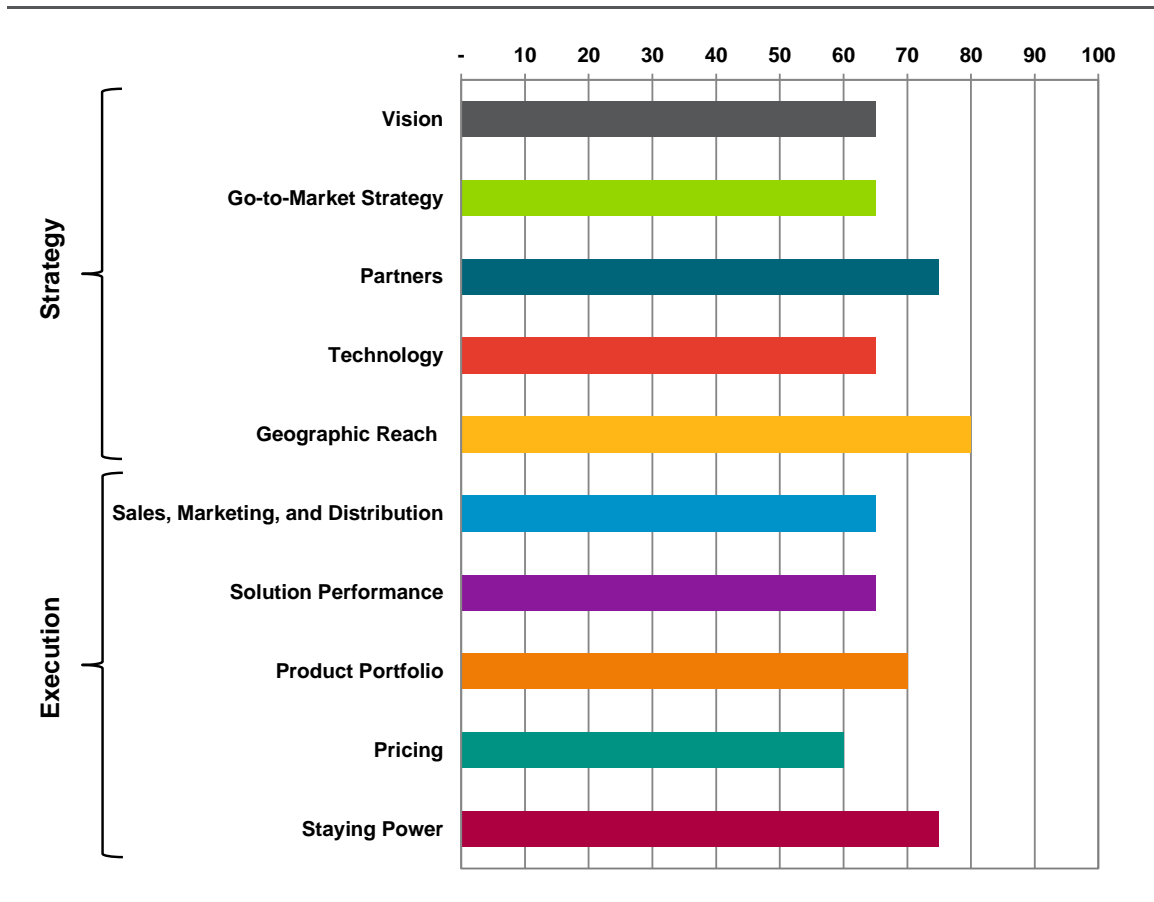
(Source: Navigant Research)

4.2.8   Siemens

Overall Score: 64.6

Strategy: 64.0

Execution: 65.3

Siemens is a global engineering and electronics multinational conglomerate organized around four business sectors: Energy, Healthcare, Industry, and Infrastructure & Cities. Based in Munich, Germany, and founded in 1847, Siemens has 351,000 employees and a presence in 200 countries. The company reported annual revenue of $89.5 billion in 2016.

The company's IoT platform is MindSphere, a cloud-based, vendor-independent operating system aimed at enterprise customers seeking to digitally transform their business processes. MindSphere functions as a PaaS on which application development can take place. It is available as either a public or private cloud, and the company plans to offer an on-premise version in the future. The platform has two main components: MindConnect and MindApps. MindConnect, as the name implies, uses built-in interfaces to link devices, industrial plants, and systems in an IoT deployment. MindApps is a set of industry-specific applications and digital services that provide asset transparency for customers and analytical insights; customers and partners can develop their own applications in this environment as well. For example, in the utility space, customers can use MindApps for meter data management (MDM), substation device monitoring, prepayment systems, and data analytics. Siemens also relies on partners for its platform's success, including firms like Accenture, European IT service provider Atos, and Bluvision, a US-based provider of sensor beacon technology.

Siemens' IoT platform is a solid solution for its many industrial customers who have come to rely on the firm for optimizing its equipment and processes. The company also benefits from the company's wide global reach and staying power. However, compared to platforms offered by Leaders in this study, MindSphere lacks some of the innovation and features customers expect for this type of process integration. In order to become a stronger competitor, Siemens needs to improve its marketing strategy outside its core manufacturing and utility bases, further innovate its technology with a more robust set of capabilities, and forge more partnerships with key IoT market stakeholders.

www.siemens.com

Chart 4.12   Siemens Strategy and Execution Scores
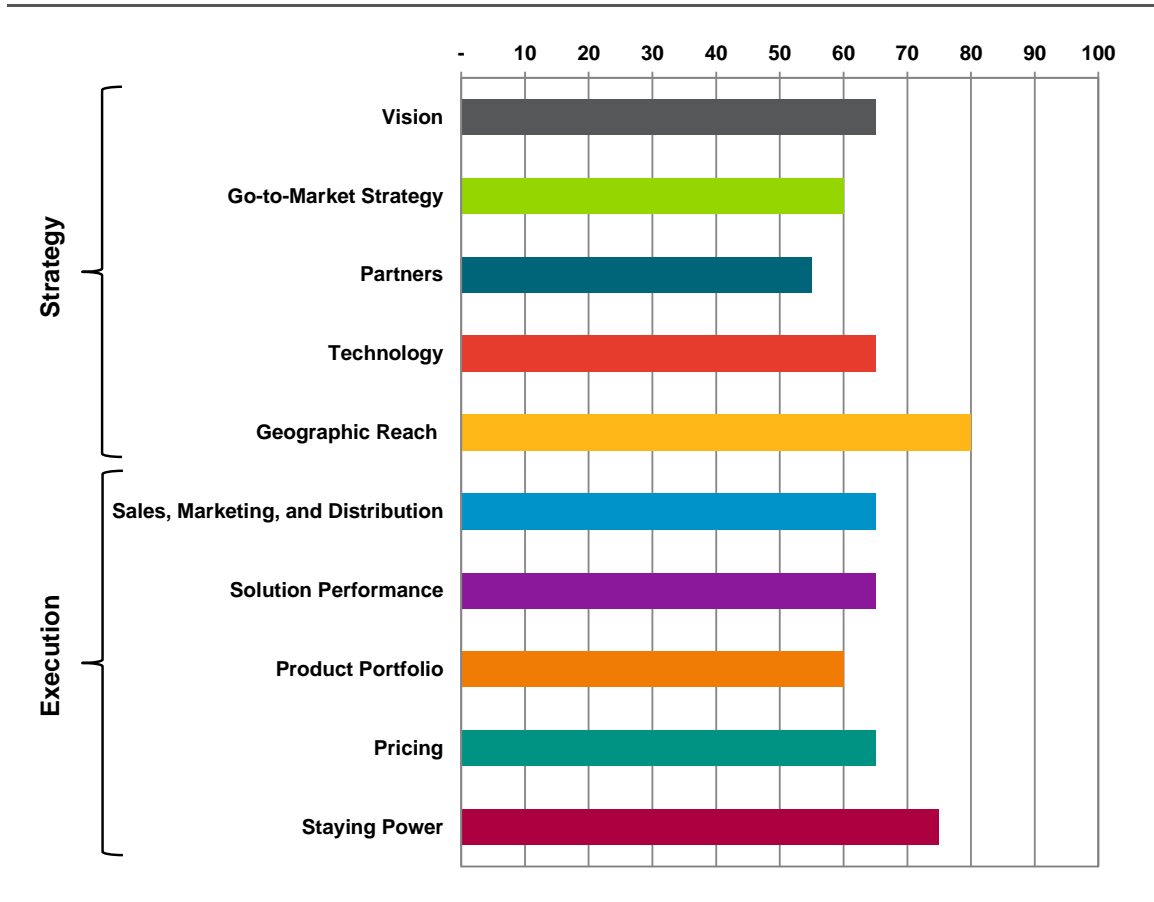
4.2.9   ABB

Overall Score: 64.0

Strategy: 61.8

Execution: 66.3

ABB is a leading global provider of industrial technologies for the energy, transportation, mining, and buildings sectors. Based in Zürich, Switzerland, the company employs more than 130,000 people and operates in about 100 countries. It reported revenue of $33.8 billion in 2016. Its products include transformers, switchgear, circuit breakers, substations, and control and monitoring systems. ABB also provides software solutions ranging from energy management to operations and maintenance solutions.

ABB's IoT platform is called Ability, a set of solutions that unify the company's cross-industry digital skills to connect disparate devices, systems, and services. The company does not see Ability as a standalone platform, but rather as means of accelerating the use of important applications that deliver value to customers seeking to improve operations.

Ability features more than 180 industrial solutions based on a cloud infrastructure. Ability leverages technologies from Microsoft Azure.

Similar to nearby Contenders in this analysis, ABB's approach to IoT buoys its ranking in terms of its geographic reach, solution performance, and partners. In an emerging IoT market, the company counts on its deep understanding of industrial controls and processes and merges that with the skills of its partners. However, to move up in the rankings, ABB should continue to add its own innovations to differentiate its offering. The company demonstrated a willingness to do just that when it completed its acquisition of Keymile Group's communication networks business in September 2017. Management noted the deal was done to support its Ability solution. This type of added capability coupled with a stronger go-to-market strategy should be part of the ABB playbook going forward.

www.abb.com

Chart 4.13   ABB Strategy and Execution Scores
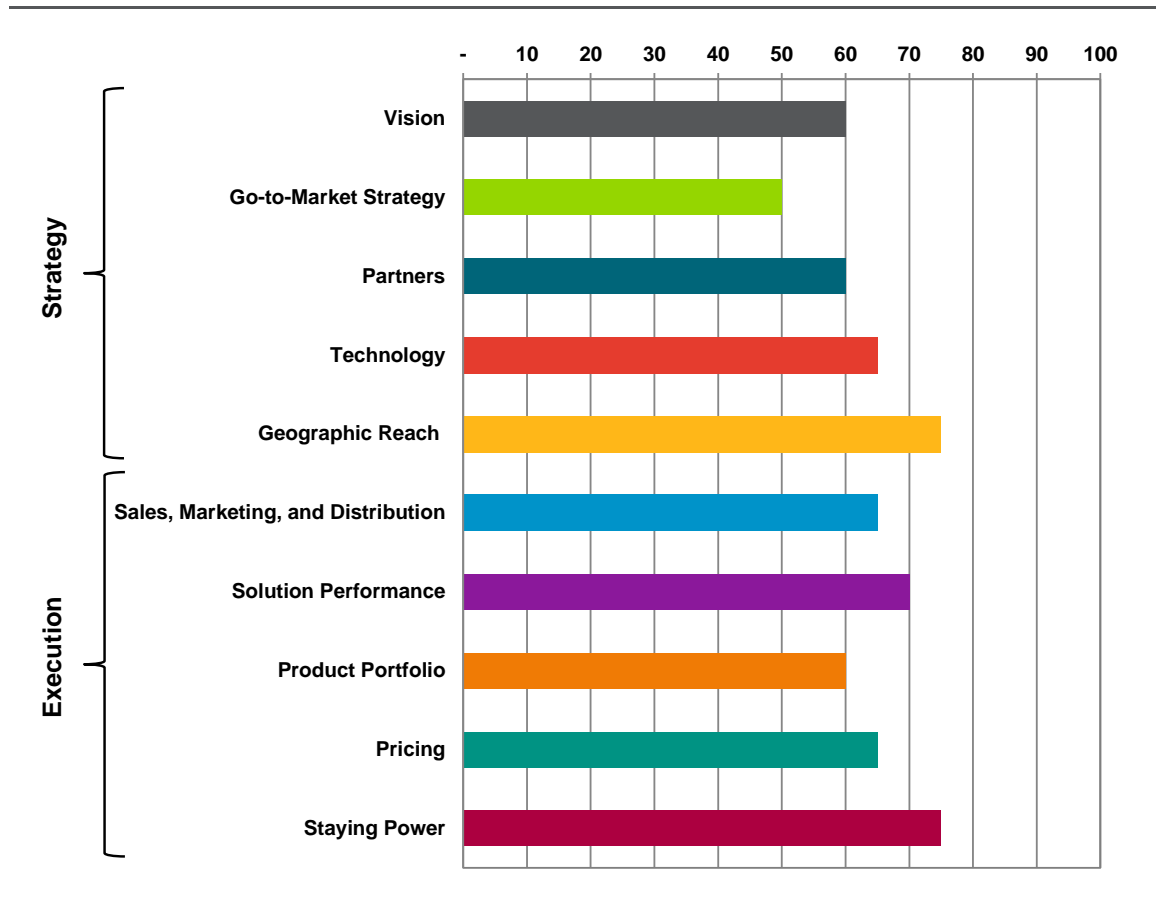
(Source: Navigant Research)

4.2.10   Schneider Electric

Overall Score: 62.0

Strategy: 62.0

Execution: 62.0

With roots dating to 1863, Schneider Electric is a large global provider of energy management and automation technology solutions for four end markets: Buildings, Data Center, Industry, and Infrastructure. The company is based in the Paris suburb of Rueil-Malmaison, France, and employs more than 160,000 people. Schneider posted $27.6 billion in revenue in 2016.

The company unveiled its most recent branding effort, Life is On, in 2015 with the aim of capitalizing on the digital transformation and IoT industry trends. The technology underpinning this branding effort is the company's IoT platform, EcoStruxure. The platform features a set of tools and digital orchestration capabilities that enable customers to connect devices, manage data, conduct analysis, and then build applications and services to optimize business processes. The platform is designed as an open and interoperable system that combines elements of cloud computing, mobility, sensing, analytics, and cybersecurity technologies. In October 2017, the company announced the latest addition to its platform with the launch of EcoStruxure Industrial Software Platform, a suite of modular software designed to address the more specific business needs in the industrial and infrastructure sectors. Part of Schneider's IoT strategy is to not compete with other IoT players in the ecosystem, but to partner with firms like Microsoft, PTC, IBM, Cisco, HPE, and more than 9,000 systems integrators.

Schneider has solid domain expertise critical to its target industrial customers seeking to capitalize on IoT technology, and it benefits from its geographic reach and distribution channels. These factors contribute to its Contender status in this Leaderboard. For now, its partner strategy might make sense. However, there is a danger that partners will take the lion's share of future IoT projects, leaving Schneider settling for less. Also, the company could benefit from a stronger set of technologies, something it appears to be addressing with its September 2017 announcement of a deal to take a controlling interest in Aveva, a British firm specializing in engineering design software and information management solutions. If Schneider can continue this path, it would lay the groundwork for a move up in the rankings.

www.schneider-electric.com

Chart 4.14   ***Schneider Electric Strategy and Execution Scores***
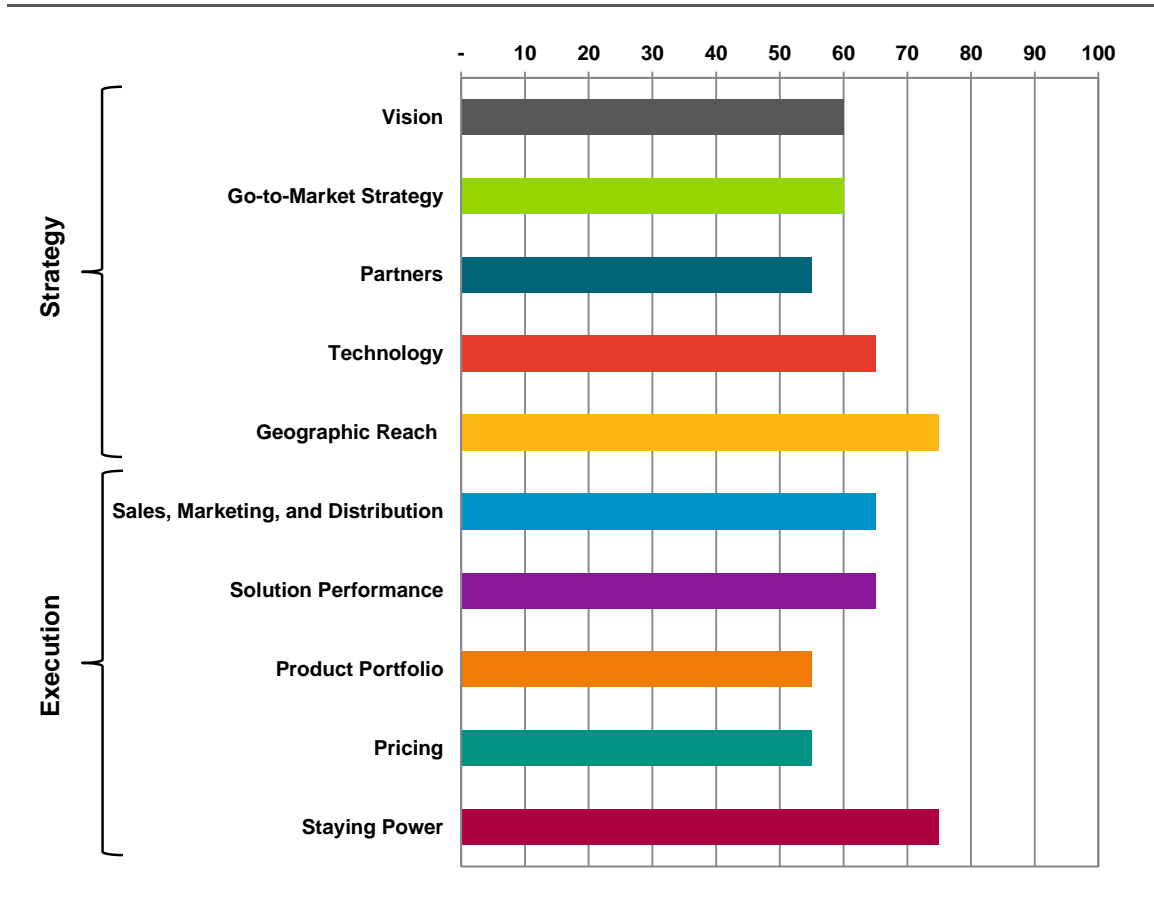
4.3   Challengers

Challengers provide IoT platforms which may be of use to enterprise customers, including electric power utilities, manufacturers, or finance. However, they do not exhibit the broader vision, project volumes, or global focus as the Leaders and Contenders.

4.3.1   Fujitsu

Overall Score: 53.0

Strategy: 56.8

Execution: 49.0

Based in Tokyo, Fujitsu is a leading Japanese information and communication technology company that was founded in 1935. It employs 155,000 people globally and serves customers in approximately 100 countries. The company generated approximately $40.5 billion during its 2016 fiscal year.

Fujitsu's cloud-based IoT platform is called K5. The flexible platform includes networking capabilities, with available infrastructure as a service and PaaS offerings. The platform operates under a framework called MetaArc that collects and analyzes sensor and device data, and then analyzes and optimizes that data to extract operational value via a dynamic process in the cloud or at the edge.

The company is held back in the IoT space for a lack of clear vision compared to some of its competitors, leaving it indistinguishable in a crowded field. In addition, it lags in its marketing efforts, and the product portfolio is relatively basic compared to other vendors in this analysis. If Fujitsu broadens its vision and develops a more innovative solution set, it could move up and become a Contender in this *Leaderboard*.

www.fujitsu.com

Chart 4.15   *Fujitsu Strategy and Execution Scores*
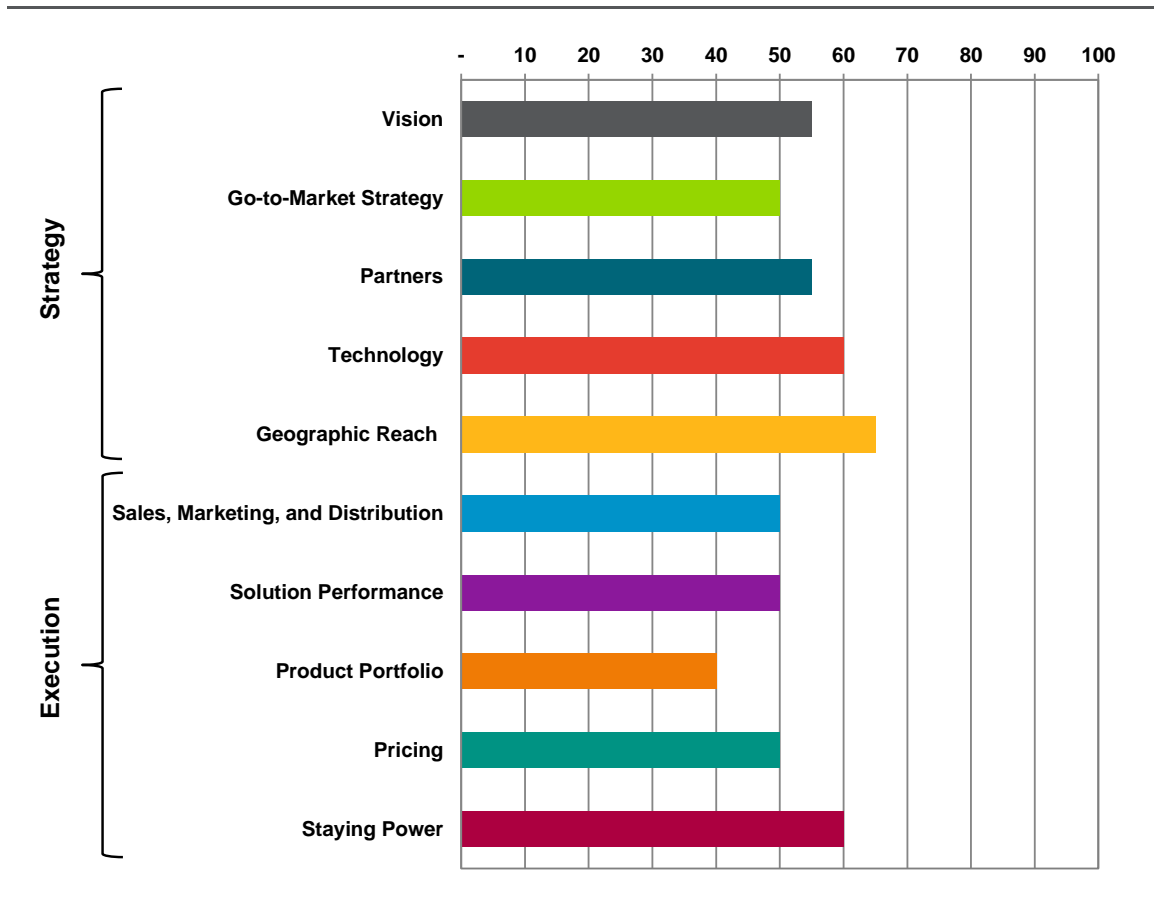
(Source: Navigant Research)

Section 5
ACRONYM AND ABBREVIATION LIST

API.. Application Program Interface

AWS ....Amazon Web Services

GE .... General Electric

IoT ....Internet of Things

IT .... Information Technology

MDM.. Meter Data Management

OEM ....Original Equipment Manufacturer

PaaS...Platform as a Service

ROI ....Return on Investment

US .... United States

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8.1 Scope of Study

Navigant Research has prepared this *Leaderboard* to provide participants in the IoT platform market with an analysis of the current competitive landscape. The *Leaderboard* is intended to help providers in this market understand how companies and brands fit into the overall global market landscape.

The major objective of this *Leaderboard* is to provide a timely overview of the companies involved in the IoT platform market, as well as their Strategy and Execution in developing, marketing, and delivery of IoT technology solutions. Company ratings capture the vendor's standing at the time of publication and are not a retrospective of past accomplishments or an indication of future success. In this market, the ratings are likely to shift as companies consolidate and switch focus and the IoT platform's value proposition evolves.

8.2 Sources and Methodology

Navigant Research's industry analysts utilize a variety of research sources in preparing research reports. The key component of Navigant Research's analysis is primary research gained from phone and in-person interviews with industry leaders including executives, engineers, and marketing professionals. Analysts are diligent in ensuring that they speak with representatives from every part of the value chain, including but not limited to technology companies, utilities and other service providers, industry associations, government agencies, and the investment community.

Additional analysis includes secondary research conducted by Navigant Research's analysts and its staff of research assistants. Where applicable, all secondary research sources are appropriately cited within this report.

These primary and secondary research sources, combined with the analyst's industry expertise, are synthesized into the qualitative and quantitative analysis presented in Navigant Research's reports. Great care is taken in making sure that all analysis is well-supported by facts, but where the facts are unknown and assumptions must be made, analysts document their assumptions and are prepared to explain their methodology, both within the body of a report and in direct conversations with clients.

Navigant Research is a market research group whose goal is to present an objective, unbiased view of market opportunities within its coverage areas. Navigant Research is not beholden to any special interests and is thus able to offer clear, actionable advice to help clients succeed in the industry, unfettered by technology hype, political agendas, or emotional factors that are inherent in cleantech markets.

8.2.1 Vendor Selection

For this *Navigant Research Leaderboard*, vendors were selected for their active participation in the enterprise or industrial IoT platform market, which includes vendors targeting the utility sector, as well as manufacturing, agriculture, mining, healthcare, commercial, education, transportation, and other subsegments where digital transformation is underway. This selection represents leading platform vendors globally, though in such a crowded market, it is possible an important vendor was not included; if so, this is purely unintentional.

8.2.2 Ratings Scale

Companies are rated relative to each other using the following point system. The ratings are a snapshot in time, showing the current state of the company. These scores are likely to be fluid as new competitors enter the market and customer requirements evolve.

- Very Strong   91 – 100
- Strong   76 – 90
- Strong Moderate   56 – 75
- Moderate   36 – 55
- Weak Moderate   21 – 35
- Weak   11 – 20
- Very Weak   1 – 10

8.2.2.1 *Score Calculations*

The scores for Strategy and Execution are weighted averages based on the subcategories. The overall score is calculated based on the root mean square of the Strategy and Execution scores.

8.2.3 Criteria Definitions

8.2.3.1 *Strategy*

- **Vision:** Measures the company's stated goals in designing market solutions against the actual needs of customers based on the entire environment in which they will operate. Clear and compelling visions that are effectively communicated to the industry result in higher scores.

- **Go-to-Market Strategy:** Evaluates the company's strategy for reaching the target market, including the sales and marketing channels to be used, as well as the processes established for informing the target market about brand differentiation and unique product value.

- **Partners:** Measures the company's established partnerships with key organizations that will provide an advantage in financial backing, sales, business, and product development. Affiliations with well-known cloud, analytics, device management, or other established IoT vendors in the supply chain, as well as a track record of financial

strength through fundraising or profitable product sales, positively affect scores in this *Navigant Research Leaderboard*.

- **Technology:** Evaluates whether the company has developed and/or patented technology that provides a significant business advantage over competitors that is likely to have an enduring impact on its success. Higher scores are given if the company's technology is already a proven market success or delivers unique product attributes.

- **Geographic Reach:** An evaluation of companies' ability to reach national and international customers through networks of distributors and resellers. Scores are lower if the company does not have a sales or dealer strategy suitable for retail or fleet sales in multiple regions.

8.2.3.2   *Execution*

- **Sales, Marketing, and Distribution:** Evaluates the company's marketing and sales performance and current distribution channel. Higher scores are given to companies with a large global dealer network with access and support for current product.

- **Solution Performance:** Evaluates the competitive performance of the platform. Higher scores are given to companies that provide a platform that lowers costs, provides flexibility, and drives new business insights and other operational benefits while delivering on customer expectations.

- **Product Portfolio:** Addresses the products' relative competitiveness in and suitability to the market. Points are awarded for platform performance and outcomes (lower costs, actionable data insights, enhanced device and asset management, new applications, future-proof, etc.) and integration with existing systems.

- **Pricing:** Determines the suitability of product pricing based on its feature set, including whether products are available at multiple price points and how pricing compares to that of competitor products.

- **Staying Power:** Evaluates whether the company has the financial resources to withstand weak or variable markets and price-based assaults by competitors. Also measures the company's likelihood to continue to pursue IoT platforms in the event of market softening. Higher scores are given to companies with better financial performance and more capability to survive market downturns.

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