

# Magic Quadrant for Managed IoT Connectivity Services, Worldwide

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By Pablo Arriandiaga, Leif-Olof Wallin, [and 2 more](#)

Managed IoT connectivity services help to reduce complexity when sourcing IoT connectivity across geographies with multiple IoT providers. I&O leaders building IoT-enabled businesses can use this document to assess vendors for multiregional IoT connectivity and value-added services requirements.

## Strategic Planning Assumptions

By 2025, hyperscalers' IoT mobile core network infrastructure will manage 20% of 5G IoT connectivity from near 0% in 2020.

By 2025, passenger vehicles with no or limited autonomy (SAE Levels 0-2) will generate 4.7EB of data that will be stored in the cloud, up from 1.1EB in 2020.

## Market Definition/Description

The managed Internet of Things (IoT) connectivity service market enables connectivity, data collection, and analysis and additional decision services that are necessary for connected solutions:

- Connections appear to be using various technologies: Connections can be cellular (2G, 3G, LTE and 5G), satellite, LPWA networks (3GPP and non-3GPP), and managed field-area networks (FANs). Public hot spots are not part of the scope.
- Managed IoT connectivity services also enable businesses to collect, analyze and interact with data streams, thus providing businesses the ability to monitor, manage and control (manually and through automation) assets associated with business processes.
- Additionally, managed IoT connectivity services may encompass integrated and managed IT infrastructure and systems, operational technology (OT) infrastructure and systems, software, network services (connectivity), and IT services.
- Managed IoT connectivity services are a solution element within the broader solution sets of digital businesses and OT systems in enterprise environments.

## Market Description

This managed IoT connectivity services Magic Quadrant focuses primarily on connectivity and a continuum of related value-added services, such as consulting, IoT connectivity device engineering, IoT connectivity application development and integration, related middleware aggregation, application hosting, and related system management.

Gartner's coverage of managed IoT connectivity services focuses on providers that bundle connectivity, technology and technology services that facilitate key business processes and related business outcomes. See Note 1 for an overview of the differences between managed IoT connectivity services and IoT. See Note 2 for information on the different types of providers that serve this market.

Managed IoT connectivity services are segregated into the following solution elements that are considered in the product evaluation criteria:

- Sourcing and logistics management
- Connectivity management portal
- Service management and support
- SIM and subscription management
- Device management
- Application management
- Security management
- Multisourcing service integration

## Sourcing and Logistics Management

This capability includes the systems and services for enterprises to purchase and provision network services (connectivity), network hardware, application functionality, and related IoT edge devices that are embedded in the connectivity management portal. These systems may present different levels of integration and automation – from the contract phase to a finally provisioned asset. This capability covers reverse logistics, including engineering, kitting, depot repair and advanced replacement of IoT edge devices and SIM cards. The services and resale of IoT endpoints and devices are included in the scope of managed IoT connectivity services. Devices with a general user interface, such as smartphones and tablets, are not included, unless those devices enable solution functionality when acting as a “gateway” and/or a solution control interface (such as a human-machine interface [HMI] within industrial environments).

## Connectivity Management Portal

This capability includes the systems for administration and operational management for device acquisition, provisioning and activation, ordering and provisioning capabilities, inventory

management, change, incident and problem management, and network performance capabilities. The portal enables data presentment, business intelligence reporting and analytics based on monitoring related systems and any underlying event processing.

Basic reporting provides visibility into alarms by asset group, auditing reports, alarm frequency reports, and device event, inventory, incidents, changes and status reports. Dashboards and data visualization may offer an ability to analyze trends on performance, SLAs, compliance, operational metrics, and billing for cost optimization purposes. More advanced reporting and analytics would offer actionable intelligence relating to asset utilization, contextualized data from customer engagement, more efficient system architectures, product improvements and rationale for monetization of connected solutions.

These portals monitor real-time consumption and asset status, generating alerts that trigger automatic actions against SIM cards or other connectivity assets in real-time (i.e., changing SIM status). This monitoring is done through rule-based business process automation, such as actions relating to excessive usage, usage nearing a user-defined threshold, SIM activations or related geolocation faults. Portals must be flexible to cope with different client requests, such as single tenant for large organizations or multitenant environments for channel partners. The portal may offer different views per segment, spanning from marketplaces for small and midsize business (SMB) clients to single instances for large multinational corporations (MNCs). Portals should export APIs to connect with other IoT systems. The portal should integrate all the other connectivity management portal capabilities for multiple connectivity sources, such as cellular, LPWA networks, satellite or connectivity agreements brought by the client. Portals should provide rate plan management and access management, defining flexible client structures and allowing different levels of permission for the users.

### **Service Management and Support**

This capability includes the systems and services to track and manage network contracts, network usage patterns, related assets and service elements. Service management may also audit and log network service performance and availability, as well as assign qualitative and quantitative ratings – which relate to negotiated SLAs – to communications service providers (CSPs). Service management also offers the ability to audit and optimize subscription plans (telecom expense management) for connectivity services based on ongoing audits of contracts, standing inventories and usage details.

Service management may allow billing and usage management based on the type of service as defined by URLs, Internet Protocol (IP) addresses, device types, access types, time of day/day of week, and location. It also includes in-country invoicing capabilities distinguishing from those countries where the provider has a cellular license to operate from those countries where it doesn't have a cellular license. Service management provides a definition of transparent governance models with clear responsibilities between the vendor and the client, including escalation procedures. This capability should include service desk capabilities to address technical requests (Levels 1, 2 and 3), including IoT security operation centers (SOCs) and network operation centers

(NOCs). It also includes physical locations where the provider is able to offer on-site support, professional services and engineering services.

### **SIM and Subscription Management**

This capability includes the systems and services that make connectivity information visible. It also covers over the air (OTA) SIM management capabilities to manage single SIM, multi-IMSI SIMs and eSIM (eUICC). It also includes the level of interoperability of these systems with mobile network operators (interoperability in eSIM, multi-IMSI and roaming). This capability also covers the ability of the provider to integrate connectivity agreements brought by the clients and the level of preintegrated agreements the vendor has with local mobile network providers in those countries where they don't own the network.

This capability includes multirouting capabilities for managing different types of traffic in parallel using the same SIM card and zero-touch SIM provisioning mechanisms. This capability is also important in LPWA networks in which remote SIM switching is not an option for certain devices due to a dramatic reduction on the life of the batteries. These reasons combined with local taxation policies impacting vendors' services trigger the need to look for hybrid scenarios, adding local SIMs combined with eSIM and global SIMs in those countries where they have specific network roaming agreements.

### **Device Management**

This capability includes the systems and services that make IoT edge devices and managed asset information visible. It also applies health diagnostics to measure IoT edge device performance and manages connection options (for example, switching between cellular, satellite, hot spot/Wi-Fi or personal-area network [PAN] modalities). Device management establishes process controls for change and release management (related to OSs, non-OS applications and support systems).

Some systems and services support the aggregation of rule-based event processing and anomaly detection from managed asset platforms (for example, data channel normalization, alarm filtering and event correlation). This includes some possible business process automation relating to service-impacting incidents tied to IoT edge device incidents and problems. It can be offered through full IoT edge device management or through partnerships with third-party software companies to resell or private-label the software.

This capability also includes processing activities and management tasks that are performed at the edge, aggregating several edge devices and filtering the information that needs to be sent to the device management platforms. This capability also offers analytics and reporting related to the IoT edge device and software parameters. This device management capability may be transversal or focused on specific industry use cases, such as automotive, global asset tracking or manufacturing.

### **Application Management**

This capability includes the systems and services to enable custom and proprietary IoT application development and distribution across software, devices, OSs, gateway agents and protocols. This service offering often includes release and change management, incident management, and problem management of IoT connectivity enablement platforms. Application development relating to the collection and analysis of M2M-connected data is in the scope of this report, as is the value-added development of front-end applications relating to business-to-business (B2B), business-to-consumer (B2C) or B2B-to-consumer (B2B2C) functions. This capability also offers analytics and reporting related to the IoT application parameters. This application management capability may be transversal or focused on specific industry use cases, such as automotive or global asset tracking.

## **Security Management**

This capability includes the systems and services to administer and enforce policies relating to the identity and data access, the transmission and encryption of data, and the secure consumption of business services linked to IoT-endpoint-connected assets. Requests for release and change management related to security management are generally controlled by the provider, unless the user requests administrator rights. The systems and services within this service segment allow authorized providers and customer administrators to establish and enforce the privacy policy for their devices, machines and assets. Included in the scope of this service segment are private Access Point Name (APN) and managed virtual private network (VPN) services.

Other services in the scope are services relating to identity, credentialing, authentication and establishment of trust between in-scope edge devices and the cloud, including preintegrated secure access capabilities with public cloud providers. Included in this capability are private LTE/5G networks and the mechanisms for seamlessly supporting the transition from private networks to public cellular networks.

## **Multisourcing Service Integration**

This set of capabilities focuses on internal initiatives and customer-facing service capabilities. From a customer-facing perspective, this capability includes the ability to act as an agent on behalf of a customer with third-party providers. These providers could be third-party network operators, IoT application independent software vendors (ISVs), IoT device manufacturers, and related alliance partners and device resellers of the managed IoT connectivity service provider. This category also relates to ongoing and project-based services (for example, service outages, network performance and coverage issues; warranty management; and management of device maintenance).

Financial management may be a component of some providers, and these services relate to audits, payments, disputes and allocation of expenses of network service contracts. Included with this service offering may be service contract novation, along with the assumption of ownership of devices and device management software. Solution financing is also considered within multisourcing service integration (MSI).

From an internal operations perspective, this function relates to a provider’s capability to identify partners to create or augment global and regional network access.

## Magic Quadrant

Figure 1: Magic Quadrant for Managed IoT Connectivity Services, Worldwide



Source: Gartner (March 2021)

### Vendor Strengths and Cautions

#### 1NCE

1NCE is a Niche Player in this Magic Quadrant. This IoT mobile virtual network operator (MVNO), headquartered in Germany, is exclusively focused on IoT, predominantly for low- and mid-data connectivity. The company is privately held, and Deutsche Telekom is one of its investors. It entered the market in 2018 with the first-ever prepaid IoT offering with 500MB of data and 250 SMS to be consumed over a 10-year period in all EU countries for a one-time payment of €10

including SIM. It has agreements with many Tier 1 mobile operators currently covering more than 100 countries.

1NCE reported 5.3 million managed IoT connections in the second half of 2020. Based on the evaluation, Gartner considers 1NCE's solutions most suitable for MNCs across Europe demanding low- and mid-data connectivity.

### **Strengths**

- The pricing model is extremely straightforward and enables multinational customers with low to moderate data connectivity use cases to embed connectivity for life into their products without worrying about roaming cost.
- 1NCE has a highly scalable cloud-native multitenant IoT platform that provides customers the choice of managing and monitoring all its connections through an extremely user-friendly portal or through APIs.
- Customers find 1NCE extremely easy to get started with since initial orders down to quantities of one can take place on its website and be paid by credit card. Already provisioned, ready to use without a PIN code, multiple form factor SIM cards are shipped next day by courier service.

### **Cautions**

- 1NCE operations and customer service activity remain heavily Europe-centric, and the vendor has weak project and service management capabilities for the large-enterprise segment. It does not manage any meaningful-size deployments outside of the region, and currently lacks a presence in Latin America.
- The company is for all intents and purposes to be regarded as a startup in its third year after coming out of stealth mode and is developing its own IoT platform, virtual core and lightweight BSS systems as it evolves.
- 1NCE offers only cellular-based IoT connectivity, so it is not suitable for companies wishing to have a single connectivity provider if they utilize other forms of connectivity, such as non-3GPP-based LPWAN or satellite.

### **Aeris**

Aeris is a Visionary in this Magic Quadrant. Headquartered in San Jose, California, U.S., it has developed and manages its own core mobile network specifically built for IoT-managed connectivity. The company developed its own application enablement and data analytics platform, and it offers a complete telematics solution to several vehicle OEMs. Apart from operating as an MVNO, Aeris is a mobile virtual network enabler (MVNE) for service providers and enterprises that wish to become an MVNO. System integration, value-added application development and support are provided through partners, although Aeris is increasing its own system integration capabilities.

Aeris reported just under 15 million managed IoT connections at the second half of 2020. This reflects a year-over-year growth of 5%.

### **Strengths**

- Aeris' API One platform further encourages independent software vendors to develop solutions that can be leveraged across more than one OEM platform, removing the need to integrate (and maintain the integration) to multiple connected platforms, and provides customers with access to off-the-shelf software solutions.
- Aeris provides a custom-built, fully virtualized IoT core network that controls all device/network interactions, including authentication, policy definition and enforcement, charging, billing, and OSS. This proprietary network enables Aeris to deliver IoT-centric innovation, such as optimize steering at device and network levels, within the network.
- The Aeris Mobility Suite provides automakers with end-to-end functionality for both horizontal infrastructure and vertical-specific application features and vendor integrations. The Mobility Suite makes it possible for OEMs and enterprises at various stages of their IoT journey to quickly get network connectivity in place that supports multiregional variation, and cost, quality and bandwidth requirements.

### **Cautions**

- Aeris hosts most of its infrastructure and application enablement components on Google Cloud platform and AWS. Customers that are heavily integrated with Microsoft-Azure-based solutions may wish to wait for Aeris to port more of its solutions to Azure.
- The majority of Aeris' portfolio remains heavily weighted to 2G connections in the U.S. While Aeris has seen the biggest growth in connections coming from outside of North America over the last year, its footprint in Europe, the Middle East, Asia/Pacific and Latin America remains modest in scale.
- Aeris hasn't reported any NB-IoT connections.

### **Arm (Pelion)**

Arm is a Niche Player in this Magic Quadrant. The U.K.- headquartered company is both an intellectual property provider for silicon hardware and an IoT software service provider. Arm offers managed IoT connectivity services based on its Pelion IoT platform, including connectivity management, device management and data management services. Arm continues investing in eSIM and iSIM (an eSIM embedded into an SoC) technologies, with a strong focus on 3GPP LPWA network technologies.

Arm reported 3.2 million managed IoT connections at the second half of 2020, reflecting a 23.2% growth rate year over year. Based on the evaluation, Gartner considers Arm's solutions most suitable for MNCs across North America, Europe and Asia/Pacific for utilities and OEMs of communications modules.



In November 2020, Arm spun out Pelion as a separate, wholly owned subsidiary of Arm. Pelion includes its managed IoT connectivity services and device management business. Pelion doesn't include Kigen, which also has been spun out as another separate company. These spin-offs are not included in the analysis of this report.

### **Strengths**

- Arm has a balanced customer base across North America, Europe and Asia/Pacific with local sales and service delivery teams in the three regions.
- Through its IoT MVNE capabilities, Arm is able to help its clients, mainly OEMs of communications modules, to monetize their IoT services with their clients and channel partners.
- Of the vendors in this Magic Quadrant, Arm is more active in iSIM, particularly for 3GPP LPWA networks with multiregional deals.

### **Cautions**

- Arm does not have industry-vertical capabilities developed nor point solutions where clients could benefit from broader IoT services.
- In this Magic Quadrant, Arm is one of the providers with fewer IoT connections under management.
- Arm's IoT capabilities may be reduced in scope when not using the hardware modules powered by Arm or not using its Mbed OS. However, Arm's solutions are hardware agnostic.

### **AT&T**

AT&T, the U.S.-headquartered company, is a Leader in this Magic Quadrant. The company's installed base resides mostly on its own networks and systems deployed in the U.S. and Mexico. AT&T's IoT connectivity platform offers management capabilities and tools for storage and data management, application development, and a portfolio of connectors to analytics services.

AT&T reported 71.7 million managed IoT connections at the second half of 2020, reflecting a 22.9% growth rate year over year. Gartner considers AT&T suitable for traditional managed connectivity services for MNCs with large fleets of cellular-connected devices in the U.S. and Western Europe.

### **Strengths**

- Gartner estimates that AT&T provides more managed IoT connectivity for connected cars than any other provider in this Magic Quadrant. AT&T is noteworthy for expanding the fleet of connected cars outside of its home networks in the U.S. and Mexico. AT&T has also demonstrated continuous collaboration and co-development with automotive OEMs.
- AT&T's clients show high degrees of satisfaction with AT&T's processes and services for project management, solution implementation and onboarding.

- Since the last Magic Quadrant for Managed IoT Connectivity Services, Worldwide, AT&T expanded global services with new infrastructure and additional LTE roaming in more than 170 countries. AT&T's breadth of carrier coverage, with mobile service on over 500 MNOs in over 200 countries and territories, is an appealing catalog for multinational companies.

### **Cautions**

- AT&T lacks experience providing connected solutions to industrial enterprises in OT environments.
- AT&T Integrated Cloud (AIC) deployments for IoT services are U.S.- or U.K.-based. The rest-of-world workloads do not benefit from the optimized, private cloud infrastructure.
- AT&T's limited installed base of IoT connectivity customers outside of the U.S., as a percentage of its overall IoT connectivity business, remains a concern for large MNCs.

### **BICS**

BICS, a subsidiary of Proximus Group, is a Niche Player in this Magic Quadrant. Headquartered in Brussels, Belgium, it is a wireless and wireline operator and service provider, offering global IoT cellular-based solutions. BICS provides customers with an international multi-IMSI SIM, with a portal to manage connections. It has multinetwork contracts in over 200 countries, enabling it to offer sophisticated roaming agreements that cover communications of both signal and data. BICS has invested in three regions (America, Europe and Asia) and a wholly owned Multiprotocol Label Switching (MPLS) infrastructure.

BICS reported that it had 2.6 million managed connections at the end of the first half of 2020. This is the first year the provider has been in this Magic Quadrant.

### **Strengths**

- BICS owns its own global network infrastructure, with regional platforms, which puts it in direct control of its service offering. This means that BICS can deliver optimized performance across all global geographies by controlling the different global connectivity layers of GPRS Roaming Exchange (GRX) and IP exchange (IPX) interconnections, signaling and roaming. It also has a global follow-the-sun NOC and support teams, which helps BICS control reliability and quality of connectivity on a global basis.
- The SIM for Things platform is specifically designed to provide a single portal for customers to manage their global IoT connections and control their spending. The platform is fully owned by BICS, enabling it to implement an agile development roadmap providing flexibility for fast customization and to support new IoT use cases. BICS also supports a full API philosophy, which means that all functionalities are available through APIs, with easy customization.
- BICS offers customers a fully elastic business model, which enables enterprise customers to pay solely for the SIMs and associated data they consume. Customers are given flexibility by decoupling SIM and data costs. This enables BICS to offer wholesale data prices that it actively

negotiates with MNOs around the world, which can be pooled across all SIMs. Wholesale prices are also offered for SIMs, with low monthly recurring charges decreasing in volume-based tiers to support better cost management as customers scale their IoT deployments.

### **Cautions**

- Companies deploying industry-specific IoT solutions (such as those for industrial or automotive use cases) should be aware that BICS does not customize its platform to meet specific vertical requirements beyond existing connectivity API change management.
- During the RFP stage of assessing managed IoT connectivity providers, companies should carefully review the costs for support and maintenance services. Vendors have very different strategies when it comes to charging for support and maintenance services. Out of all the companies examined in this year's Magic Quadrant, BICS's revenue from this service activity is the largest as a percentage of its total IoT income.
- BICS has a very small global sales force dedicated to IoT, which means that companies engaging with it during a sales cycle should be prepared for a low-touch engagement and self-service onboarding.

### **Cubic Telecom**

Cubic Telecom, headquartered in Dublin, Ireland, is a Challenger in this Magic Quadrant. It was founded in 2005 and has agreements in place with 90 mobile operators to provide connectivity in over 190 countries. The company is privately held with €110 million in funding by Car.Software Org of the Volkswagen Group, European Investment Bank, Qualcomm, and the Ireland Strategic Investment Fund, among others. Cubic Telecom is focused mainly on the automotive sector, and it's starting to move into other industry-verticals.

Cubic reported 3.5 million managed IoT connections at the end of the first half of 2020, reflecting year-over-year growth of 35%. This is the second year Cubic Telecom has been in this Magic Quadrant.

### **Strengths**

- To enable seamless regulatory compliance for global IoT device manufacturers, Cubic's Platform for Application and Connectivity Enablement (PACE) together with PLXOR, a new data classification add-on to PACE, provides remote SIM provisioning functionality to support zero-touch automated eUICC SIM localization (e.g., local profile download) for IoT devices on network attach procedure.
- Cubic Telecom operates its own core network, which it can break out of in Dublin, Frankfurt, Sydney, Miami, Brazil and Singapore. These local points of presence help customers reduce latency, reduce data backhaul costs and improve connections with local providers.
- MNCs that require cellular connectivity for large device deployments across Europe, North America and Asia/Pacific will find Cubic Telecom to be not only a supplier of connectivity, but

also a long-term partner.

### **Cautions**

- Despite its partnership with Kymeta, which could enable Cubic to provide customers with a satellite-cellular hybrid package, Cubic Telecom manages mainly 4G-cellular-based IoT connections. It is focused on higher-bandwidth, high-volume use cases and does not support NB-IoT or have heritage cellular connections (e.g., 2G, 3G devices) on its network.
- Cubic is focused on a narrow range of target sectors such as automotive, agriculture, energy and transportation, and would not make a suitable partner for SMBs wishing to deploy small-scale IoT solutions.
- Cubic is still in a growth phase and has required investment in order to fund R&D – it isn't yet able to sustain investments in its business from its commercial offerings. Automakers need to assess whether Car.Software Org's investment in Cubic Telecom and its close alignment with the broader Volkswagen Group make it in any way a competitive threat.

### **Deutsche Telekom**

Deutsche Telekom, a Visionary in this Magic Quadrant, is a CSP and IT services company headquartered in Bonn, Germany. Its newly formed Deutsche Telekom IoT business provides productized IoT connectivity and IoT professional services and solution competencies. The company serves its customers worldwide either directly (Europe and the U.S.), through roaming partners or, in the case of Brazil and China, with local MVNOs. On 1 April 2020, T-Mobile, Deutsche Telekom's subsidiary, successfully completed its acquisition of Sprint.

Deutsche Telekom managed 45 million IoT connections at the second half of 2020, reflecting a year-over-year growth rate of 57%, though most of this increase was due to the Sprint acquisition.

### **Strengths**

- Gartner considers Deutsche Telekom's solutions suitable for IoT connectivity and IoT use cases for MNCs with large fleets of connected devices across Europe (its core focus) and North America (where its acquisition of Sprint will help improve its capabilities/presence). The zero-touch provisioning of SIMs will ease the deployment of IoT endpoints, helping companies to roll out connected services at scale.
- The use of dual and hybrid APNs enables automakers to offer split and itemized billing to customers. This functionality enables end consumers to pay for data that is used by a vehicle Wi-Fi hot spot, for example.
- Deutsche Telekom's IoT hub is designed to act as a platform beyond connectivity to orchestrate and preintegrate with external managed IoT connectivity platforms and IoT platforms. This provides one platform where data can be collated and harmonized, and actions can be taken. T-Systems global presence also helps with clients looking for IoT services beyond managed IoT connectivity.

### **Cautions**

- With its Sprint acquisition, which increases its footprint in the North American market, Deutsche Telekom was in the process of creating a value proposition for managed IoT connectivity services in North America that could be aligned with its broader group strategy.
- The use of a wide range of portals through which customers are required to undertake tasks has the potential to be confusing to new customers, though Deutsche Telekom is in the process of integrating all its portals under the IoT Hub.
- Deutsche Telekom's new IoT business unit is not leveraging the Curiosity platform and innovation it acquired with Sprint. This could cause Deutsche Telekom to fall behind its global CSP peers regarding multiaccess edge computing and its impact in managed IoT connectivity services.

### **Itron**

Itron, a Visionary in this Magic Quadrant, is a network and IoT solution provider based in the U.S. The company's business is the implementation of infrastructure and systems for utilities and smart cities. Itron's platform solutions include software and managed services for the monitoring and management of Itron RF and cellular network solutions.

Itron managed 71.3 million IoT connections by mid-2020, reflecting a year-over-year growth rate of 11.9%. Based on the evaluation, Gartner sees Itron as suitable for asset-intensive industries, such as utilities, mining, and oil and gas, and solutions for municipalities in North America, Latin America, Europe and Asia/Pacific.

### **Strengths**

- Customers consistently point to reduced expenses, avoidance of loss and revenue leakage, and faster time to solution as the top drivers for choosing Itron solutions, which include managed IoT connectivity services.
- Itron demonstrates strong customer satisfaction in municipal governments for connected solutions such as traffic management, public safety, environmental sensing, and various utilities-centric technology and business outcomes.
- Itron's deepest and strongest value lies in its expertise and experience managing energy, gas and water usage across residential, commercial and industrial customers in North America, Europe, Asia/Pacific and Latin America.

### **Cautions**

- Enterprises will find that 3GPP-standards-based connectivity is a much smaller portion of the Itron installed base, with Itron having no demonstrated experience and expertise relating to NB-IoT and LTE-M.
- Itron prospective customers must understand the depth and breadth of partner-based delivery, as some customers have identified Itron's reliance on local providers as a cause of solution

deployment delays.

- Enterprises outside of utilities, government and transportation may find the Itron portfolio less compelling outside of demand response, some building infrastructure capabilities and outdoor lighting for large campuses.

## **KORE**

KORE, a Leader in this Magic Quadrant, is headquartered in the U.S. The vendor serves nearly 7,000 companies and has built a strong and differentiating global presence with its global operations. KORE offers a broad catalog of IT management services as well as forward and reverse logistics services. It acquired Integron in December 2019, reinforcing its sourcing and logistics and life cycle management services, particularly in the healthcare industry.

Based on the evaluation, Gartner considers KORE's solutions suitable for connectivity services in telematics, healthcare, cross-industry asset monitoring and fleet management for companies requiring connected fleets of devices around the world.

### ***Strengths***

- KORE remains one of the more geographically diverse MVNOs and exceeds the geographic diversity of most MNOs.
- KORE's ability to provide life cycle services for its large catalog of certified and tested IoT connectivity modules and devices is market leading.
- KORE's managed services experience enables the company to provide solutions with superior operational efficiencies and cost savings.

### ***Cautions***

- KORE's customers' evaluation of the firm's service and support is on the low end of the participants of this Magic Quadrant.
- KORE lacks a broad catalog of value-added IoT applications, which is an increasing demand of customers.
- KORE's managed IoT connectivity installed base does not demonstrate traction for data and device management, and analytics and visualization. Future viability is contingent on expanding the sale of value-added products and services beyond telematics.

## **NTT**

NTT, headquartered in Japan, is a Niche Player in this Magic Quadrant. It provides ICT solutions and international communications services. NTT acquired French IoT MVNO and MVNE Transatel in 2019. With this acquisition, NTT is using Transatel capabilities for offering global IoT connectivity and managed IoT connectivity services worldwide as a global IoT MVNO. NTT is in the process of spreading Transatel's managed IoT connectivity services across NTT.

Gartner estimates that NTT had more than 5.2 million managed IoT connections at the end of the first half of 2020. Based on this analysis, Gartner recommends NTT for automotive and manufacturing across Asia/Pacific and Europe.

This report covers NTT with respect to revenue, IoT connections, LTE-M and 5G capabilities, and vertical expertise prior to the announcement to 100% privatize NTT Docomo on 29 September 2020. It does not include information on all NTT Group companies.

### **Strengths**

- NTT is the CSP in this Magic Quadrant that is able to provide more flexibility to enterprises with bring-your-own-connectivity scenarios.
- NTT is one of only two service providers in the Magic Quadrant with the majority of its managed connections in the Asia/Pacific region.
- Customers have quoted NTT for their knowledge on the local regulation in scenarios where local connectivity is needed.

### **Cautions**

- NTT's global IoT organization for sales and service delivery for managed IoT connectivity services is immature. It's in the process of integrating Transatel's IoT capabilities across NTT's global footprint.
- NTT's industry-vertical strategy for managed IoT connectivity services is poor and, even in the verticals it is addressing, it doesn't have a critical mass of connections compared to its traditional IoT MVNE business.
- NTT has reported no connections regarding NB-IoT or LTE-M. NTT's focus for the future regarding 3GPP LPWAN is only LTE-M.

### **Orange Business Services**

Orange Business Services (Orange), the enterprise service unit of Orange Group, a global CSP headquartered in France, is a Leader in this Magic Quadrant. Orange's IoT business is part of the Smart Mobility Services business unit within Orange. It focuses on end-to-end managed IoT connectivity service implementations, device engineering, consulting, application development and integration, security, and analytics that are built on cellular and LPWA networks like LoRa.

Orange reported 21.1 million connected objects at the end of the first half of 2020, more than a 12% increase from midyear 2019. Based on the evaluation, Gartner sees Orange's solutions as suitable for the automotive and transport, industrial and manufacturing, and smart city sectors.

### **Strengths**

- Orange continues to enhance its security and data analytics capabilities while gaining momentum in industrial applications like Industrie 4.0 and industrial campus deployments, mainly across Europe.



- Orange is an end-to-end integrator and operator that continues to receive customer praise for being able to deliver all the necessary technical and service components of an end-to-end managed IoT and analytics solution.
- Orange has created a valuable ecosystem of multicountry strategic partnerships with companies such as Siemens, Google and Microsoft.

### **Cautions**

- Orange started its journey into LPWA networking by rolling out a non-3GPP-based LoRa network in France and is now focused on adding LTE-M to its 3GPP-based mobile networks. The company has no plans for deploying NB-IoT networks at scale, and it maintains NB-IoT networks only in Belgium and Luxembourg.
- Orange's installed base is Europe-centric, with only modest connectivity in other parts of the world. The company has a lack of sales focus for IoT in regions such as the Americas and APAC compared to Europe, although the company has increased sales headcount out of Europe.
- Orange was slow to address IoT as part of its standard MSI strategy, although the company is now delivering discrete MSI IoT projects for some large MNCs.

### **Sierra Wireless**

Sierra Wireless, headquartered in Canada, is a Visionary in this Magic Quadrant. The manufacturer of cellular modules and other hardware also operates as an MVNO. This provides an advantage when bundling solutions that span connectivity, hardware and software within the Sierra Wireless catalog.

Based on the evaluation, Gartner sees Sierra Wireless solutions as suitable for telematics, connected vehicles, point-of-sale connectivity, manufacturing and insurance use cases.

### **Strengths**

- Customers of Sierra Wireless praise the AirVantage platform for its ease of use.
- Sierra Wireless can provide preintegrated device-to-cloud solution bundles, which greatly simplifies its customers' IoT deployments and reduces their time to market.
- Customers of Sierra Wireless regularly identify customer service and support as exceptional.

### **Cautions**

- Sierra Wireless lacks an active partner base of SIs and MSPs that are certified and able to resell bundled solutions.
- Sierra Wireless solutions are easier to integrate and manage when customers standardize on the company's own hardware, software and IoT connectivity.



- Sierra Wireless received our lowest rating for Viability because the company lags the market in terms of growth rate and continues to post negative operating margins quarter after quarter.

## **Soracom**

Soracom is a Niche Player in this Magic Quadrant. The cloud-native IoT MVNO provider, headquartered in Japan, was acquired by Japanese CSP KDDI in 2017. Soracom is a managed IoT connectivity service horizontal player with focus on networking, eSIM, security, APIs and cloud integration. Soracom integrates LPWA networks including LTE-M and Sigfox. Soracom also launched its first branded device, a programmable cellular camera.

Soracom reported 2.6 million managed IoT connections at the second half of 2019, a 160% year-over-year growth. Gartner sees Soracom's solutions as suitable for consumer electronics, utilities and point-of-sale connectivity.

## **Strengths**

- Part of Soracom's founders come from AWS. The company has developed a fully virtualized and cloud-agnostic network and managed IoT connectivity platform. This positions Soracom better than other vendors in this Magic Quadrant related to integration with hyperscalers and edge computing.
- Soracom has a higher distribution of eSIM connections among its overall managed IoT connections (57%) compared with other vendors in this Magic Quadrant.
- Soracom's platform and SW are developed by the company using proven agile methodology aligned with its deliverables. Soracom's portfolio and pricing are simple, modular and transparent. This gives Soracom's clients a total understanding of Soracom's capabilities at the beginning of the relationship.

## **Cautions**

- Soracom's direct presence in Europe and North America is very small, so clients should expect very low-touch sales and service delivery provided from those two regions. Soracom's resources and professional services for large implementations are mainly located in Japan.
- Soracom's managed services and professional services are weak because the vendor is more focused on self-managed services. Its sales organization is immature and has a lack of structure compared to other vendors in this Magic Quadrant.
- Soracom is one of the providers with the poorest network ecosystem of all participants in this Magic Quadrant.

## **Telefónica**

Telefónica, a global CSP headquartered in Spain, is a Leader in this Magic Quadrant. The company leverages its strong direct presence in Europe and Latin America to build its managed IoT service business, augmented with roaming partners as needed. Telefónica has invested in deep expertise

to offer a compelling portfolio to its clients that is differentiated with its account management, security, big data and multisourcing service integration services.

Gartner estimates that Telefónica had about 36 million IoT connections under management at midyear 2020, a 14% growth year over year. Telefónica continues to show success in energy and utilities, automotive, retail, manufacturing, and transportation sectors as well as smart city initiatives.

### **Strengths**

- Telefónica provides managed IoT connectivity services that span public and private LPWANs, 2G, 3G, LTE, 5G, fixed line and satellite to a satisfied customer base.
- Telefónica's prominent investment in staff and processes puts it in a good position to handle complex contracts with significant amounts of service integration and partner management, predominantly for the Spanish market.
- Telefónica enjoys strong levels of satisfaction for flexible contracting, account management and customer service capabilities across Europe and Latin America. Its strength is based on deep local presence, empowered sales teams and resources in all the geographies it serves. Startups perceive Telefónica as easy to work with.

### **Cautions**

- Telefónica continues to have little direct presence and a small installed base outside of Europe and Latin America. Global execution outside those geographies remains unproven.
- Telefónica is going through a significant reorganization where IoT is now organized together with big data into a business unit. It's uncertain if IoT will lose focus. In addition, Telefónica has communicated to the market that it is prioritizing four of its national markets: Spain, Brazil, Germany and the U.K., without being explicit about what that means to the other markets.
- Some customers continue to cite weakness in Telefónica's network partners, citing poor responsiveness for network incident and problem management.

### **Telenor Group**

Telenor Group, a Leader in this Magic Quadrant, is a CSP headquartered in Norway. It provides IoT services through its dedicated IoT subsidiary, Telenor Connexion, as well as its operating companies (OpCos) across nine countries in the Nordics and Asia. The Telenor offerings are composed of managed connectivity, analytics and cloud IoT platforms.

Gartner estimates that Telenor Group had more than 16 million managed connections at the end of the first half of 2020. The primary geographic focus areas of Telenor are Europe and Asia/Pacific. Based on the evaluation, Gartner sees Telenor services as suitable for large-scale utility solutions, connected vehicles/products, fleet management and third-party logistics solutions for MNCs across Europe and Asia/Pacific.

### **Strengths**

- Telenor is the ninth largest operator worldwide by number of subscribers. It has access to attractive wholesale and roaming rates to complement its portfolio of specific IoT bilateral agreements, including important markets like the U.S., Brazil and China.
- Customers continue to show confidence in the capabilities of Telenor to meet business requirements and deliver a reliable service, as evidenced by an extremely high resigning/renewal rate.
- Clients consistently praise the “can do” attitude of Telenor when it comes to solving customer issues, regardless of footprint.

### **Cautions**

- Telenor Connexion is increasingly focusing on complex international deals only, while leaving small to midsize IoT projects with limited geographic scope to the local Telenor OpCos that sell highly standardized services.
- Telenor does not manage a sizable installed base outside of Europe and Asia/Pacific.
- Some clients find Telenor pricing commanding a premium to comparable competitors.

### **Telit**

Telit, a Niche Player in this Magic Quadrant, is headquartered in London. It is a manufacturer of wireless connectivity modules and also an IoT services provider with a portfolio of IoT software platforms and global IoT connectivity services. Telit started its IoT connectivity business in 2011, and it's now transitioning from a light IoT MVNO to a full IoT MVNO with its own core network, with the first deployments in Europe followed by the U.S.

Gartner estimates that Telit had more than 3.7 million managed IoT connections at the end of the first half of 2020. The primary geographic focus of Telit is Europe and North America, with 25 offices worldwide. Based on the analysis, Gartner recommends Telit for manufacturing, transportation and utilities solutions across North America and Europe.

### **Strengths**

- Telit's broad catalog of communications modules provides enterprises simpler sourcing including, together with the modules, managed IoT connectivity or device management without the need of sourcing an additional provider across a variety of industry verticals.
- Telit is one of the vendors in this Magic Quadrant with better brand recognition for managed IoT connectivity services.
- Telit has a balanced customer base with a main focus on midsize enterprises.

### **Cautions**

- Telit has network agreements only with European and U.S.-based providers, which limits its ability to offer local IoT connectivity out of these regions beyond roaming services.
- Telit's managed IoT connectivity capabilities may be reduced when not using Telit's own HW modules. Gartner has seen little evidence of managed IoT connectivity services provided by Telit without the HW component.
- Telit's main source of revenue is the hardware business. Managed IoT connectivity services is a small portion of the overall IoT business it manages, though it shows double-digit growth year over year.

## **Verizon**

Verizon, a Leader in this Magic Quadrant, is a CSP headquartered in the U.S. The company is significant in this Magic Quadrant for its portfolio of value-added IoT applications.

Gartner estimates that Verizon had about 45.2 million IoT connections under management at midyear 2020, a 13.9% growth year over year. Based on the evaluation, Gartner sees Verizon's services as suitable for transportation management, smart grid, meter solutions and smart city. Verizon is recommended for enterprises requiring fleets of connected assets in the U.S. and small fleets in Europe. Gartner advises U.S.-based MNCs to approach managed connectivity outside of the U.S. on a case-by-case basis.

## **Strengths**

- Verizon is a market leader in terms of expanding its revenue and impact beyond connectivity through the sale of IoT applications for telematics, transportation and utilities.
- Verizon's ThingSpace platform and portal offer capabilities for device and network health (diagnostics), configuration management, threshold-based alerting, and SIM and device software management.
- Verizon offers flexible pricing models to meet customer needs based on their IoT solution use case.

## **Cautions**

- Although Verizon meets the Magic Quadrant criterion, the company's installed base is not geographically diverse, and the company continues to be challenged to grow its managed IoT connections outside of the U.S.
- Verizon lacks a differentiated catalog for edge computing and related analytics to accelerate adoption beyond connected mobile assets.
- Verizon's customers are relegated to partner support outside of the U.S. and are significantly less satisfied with the managed IoT connectivity services they receive from the vendor out of the U.S.

## Vodafone

Vodafone, a Leader in this Magic Quadrant, is a global CSP headquartered in the U.K. that provides a wide range of value-added services to its customers beyond pure connectivity through seven dedicated subsidiaries. Vodafone-staffed operating centers are located in more than 50 countries. The company sells directly to MNCs and small-to-midsize companies via Vodafone Global Enterprise (VGE), its IoT subsidiaries and its operating companies, as well as indirectly through partners.

Vodafone reported 103 million managed IoT connections across 180 countries at the end of June 2020, which represents a 23% year-over-year growth. Vodafone services multiple vertical markets, including automotive, energy and utilities, health, insurance, industry, public sector, transportation, natural resources, and retail.

### Strengths

- Vodafone has the most IoT connections of the vendors in this Magic Quadrant and is consistently chosen by large and complex customers, evidenced by a strong year-over-year growth rate and increase in NPS.
- Vodafone continues to show creativity and innovation in its approach to building IoT solutions and proposals. The latest proof point is its “Ready Together” program where the first year is free for any company adopting IoT or introducing a new IoT product.
- Feedback from customers about the delivery of private mobile network services and edge computing services for IoT continues to be favorable.

### Cautions

- Customers continue to report lower-than-average experiences of local invoicing of 2G, 3G, LTE or public LPWA network connectivity at a global scale.
- Some of Vodafone’s customers have experienced delays in LPWA network rollouts and a lack of LPWA roaming across large footprints.
- Integration with local carriers for local connectivity (not roaming) has continued to be a challenge predominantly around some “heavily regulated” countries.

## Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant may change over time. A vendor's appearance in a Magic Quadrant one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

### Added

The following vendors were added:

- 1NCE
- BICS
- Soracom
- NTT
- Telit

## Dropped

The following vendors were dropped:

- A1 Digital
- KPN
- ORBCOMM
- Sprint
- Tele2 IoT

## Inclusion and Exclusion Criteria

All of the following criteria must be met:

- Providers must have at least 2,500,000 connected IoT devices under management (direct contract) by the end of June 2020. Connections can be cellular (2G, 3G, 4G, 5G), LPWAN (3GPP and non-3GPP), satellite and managed FANs. However, public hot spots are not acceptable. Laptops, tablets or smartphones that could have the purpose of mobile broadband connections and belong in mobile voice and data subscriptions together with Mi-Fi devices are not acceptable either. This applies unless their exclusive use is to function as a gateway for an IoT solution or act as an HMI terminal to access asset data and visualizations.
- Providers must solicit and deliver panregional or global services. Panregional services require delivery of services to at least three of the following five geographies, including direct local commercial presence in those regions with at least 200,000 IoT-connected devices under management in each region by the end of June 2020:
  - Asia/Pacific and Japan
  - Europe
  - Latin America
  - Middle East and Africa

- North America
  
- Providers must have at least \$24 million in managed IoT-connectivity-related revenue by the end of June 2020. Revenue may include bundled connectivity, IT (hardware and software) and IT services for IoT connectivity and IoT solutions.
- Providers need to have won new clients in at least two different regions since 30 June 2019 and support at least three unique customers in at least three geographies.
- Providers must offer life cycle management services, including professional and support services (inclusive of reverse logistics), as a component of their managed IoT-connectivity solution (for example, device engineering, consulting and advisory services, service contract management, device warranty management, management software/middleware integration, device disposal and recycling, depot repair, kitting, on-site support, help desk, and service desk). These services may be delivered via partners, but the rated vendor must act as the prime contractor.
- Providers must extend to enterprises a portal for accessing data related to monitored assets/processes. Providers must also offer the ability to administer and control network services related to the monitored assets, as well as the ability to provide change and release management relating to connectivity, connectivity modules, gateways and other support systems.
- Providers must maintain infrastructure and network systems that add value to the resale of network services and SIMs (often referred to as heavy or full MVNOs). Providers that resell network services will be considered for this Magic Quadrant; however, resellers of connectivity services must provide life cycle management of the relevant contracts. Gartner prefers resellers that bundle IoT connectivity and IoT solutions and own the service contracts (service novation). Such reseller providers are often referred to as “light MVNOs.”
- Providers may sell bundled solutions; however, providers must also make IoT hardware and IoT connectivity management available as separate saleable offerings.

## Honorable Mentions

### A1 Digital

A1 Digital, part of A1 Telekom Austria Group (A1 Group) and América Móvil, is a digital solution provider headquartered in Austria. It helps customers deliver industry-specific IoT applications, as well as advises companies on issues of digital transformation. Its offering includes paid professional services, the provision of IoT/machine learning (ML) technology and business analytics platforms as a service, on top of Exoscale, its own European infrastructure as a service (IaaS) offering.

The company did not meet the Magic Quadrant criterion for including direct local commercial presence in at least three regions.

## Eseye

Eseye is an MVNO based in the U.K. The company provides global cellular connectivity under its eSIM-compatible, multi-IMSI AnyNet Secure multioperator proposition. The AnyNet eSIM card can be remotely provisioned, allowing for home country redesignation or localization of the SIM. This eases and simplifies the process by which a device can connect across the numerous networks that the MVNO has agreements with. Eseye also has its own hardware portfolio, comprising off-the-shelf devices, as well as some custom-made integrations with the likes of Thales.

The company did not meet the Magic Quadrant criterion for having at least 2,500,000 connected IoT devices under management.

## KPN

KPN is a CSP based in the Netherlands. In the field of IoT, KPN serves automotive, manufacturing, healthcare, utilities, agriculture and government (smart cities, public transport and critical communications). KPN wraps extended value around its IoT customers in Europe, often spanning end-to-end IoT solutions. These solutions include its own hardware devices, connectivity, vertical applications and data management under the “KPN Things” proposition.

The company did not meet the Magic Quadrant criterion for including direct local commercial presence in at least three regions.

## ORBCOMM

ORBCOMM is a satellite network provider and a cellular/LTE MVNO based in the U.S. ORBCOMM’s portfolio includes global satellite, cellular and dual-mode network connectivity, as well as hardware, connectivity management, vertical IoT applications and analytics. The ORBCOMM vertical applications are focused on transportation and third-party logistics, heavy equipment fleet management, industrial fixed assets, natural resources (water, oil and gas, and agriculture), maritime, and government.

The company did not meet the Magic Quadrant criterion for having at least 2,500,000 connected IoT devices under management.

## Tele2 IoT

Tele2 IoT, part of Tele2 Group, is a CSP based in Sweden. Tele2 IoT has evolved from a pure connectivity provider to a horizontal-IoT-enabling service provider delivering agnostic connectivity on a global basis. Tele2 IoT was the first CSP to sign up for Nokia WING as a service in February 2018, and its EnCore infrastructure service for advanced customers is based on WING. Tele2 IoT also has MVNE capabilities to enable its customers to become an MVNO.



The company did not meet the Magic Quadrant criterion for including direct local commercial presence in at least three regions.

## Wireless Logic

Wireless Logic is a privately held IoT MVNO, headquartered in the U.K., with 20 years' history in the IoT market. Wireless Logic provides managed IoT connectivity services through its SIMPro platform across a number of different networks and industry verticals worldwide.

The company did not meet the Magic Quadrant criterion for including direct local commercial presence in at least three regions.

## Evaluation Criteria

### Ability to Execute

Gartner evaluates vendors on the quality and efficacy of the processes, systems, methods or procedures that enable IT provider performance to be competitive, efficient and effective, and to positively impact revenue, retention and reputation within Gartner's view of the market.

Ability to Execute is judged by seven main criteria. Each criterion is described below, and its respective weighting is shown in Table 1.

### Product or Service

For this criterion, we review and evaluate each provider's network and IT services delivery capabilities and the related portfolio offered. We scrutinize service capabilities from the perspective of companies with global requirements: service definitions that meet predominant use cases, diverse connectivity offerings, effective resourcing capabilities (organically and partnered), and account management.

### Overall Viability

This criterion includes the following:

- A best-effort assessment of the overall financial health of the provider's organization
- The success of its managed IoT connectivity service business
- The likelihood that the managed IoT connectivity service business unit (if distinct and separate) will continue investing to support innovation and delivery of the organization's portfolio of services

Focused consideration within this analysis included the organization of the relevant business units, the rate of investment and innovation, and multiyear revenue growth rates. Additionally, Gartner worked to understand divergent, and possibly dilutive, strategies within many MVNOs, which are pursuing parallel strategies to become enabling software providers for competing CSPs and MNOs.

## Sales Execution/Pricing

For this criterion, we assess each provider's capabilities in presales activities and the organization that supports the capabilities. We consider teams in charge of deal management, street pricing (based on a Magic Quadrant survey and user feedback) and clarity of scope. Focused consideration within this analysis included users' perception of affordability, the sales organization to sell value and future-proofed solutions predicated on diverse connectivity beyond 2G.

## Market Responsiveness/Record

For this criterion, we assess each provider's ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customers' needs evolve and market dynamics change. Focused consideration within this analysis included users' feedback on the provider's flexibility, continuous improvement and innovation.

## Marketing Execution

For this criterion, we assess the clarity, quality, creativity and efficacy of programs that are designed to:

- Deliver an organization's message to influence the market
- Promote its brand and business
- Increase awareness of its services
- Establish a positive association in the minds of buyers between the company and its services and brands

Focused consideration within this analysis included users' feedback on the provider's reinforcement of value to its users and Gartner analysts' perceptions of the provider's marketing execution.

## Customer Experience

For this category, we evaluate reference customers' overall satisfaction with the services and the provider relationship, taking into account additional Gartner-client interactions (for example, customer inquiries and one-on-one conversations at events). We obtained access to reference customers by asking each provider to identify at least five reference customers and a maximum of 15 for its managed IoT connectivity services. We required the provider's selection of reference customers to observe the geographic distribution needed to participate in the study and the different industries addressed.

In particular, we consider the important elements of a successful managed IoT connectivity service customer experience. These include overall client satisfaction, value-added management platforms and services, and continuous improvement processes in place – both centrally and within the account management team.

## Operations

For this category, we assess each provider's ability to meet its goals and commitments, including contractual service delivery obligations to clients. Factors include the quality of the organizational structure, skills, experiences, programs, systems and other vehicles that enable the service provider to operate effectively and efficiently on an ongoing basis.

We speak to the service providers about their main procedures (operational, transitional and relating to program management, relationship management and change management) and ask their reference customers for feedback about those procedures. We also ask the providers to supply information about the platforms and services they provide, the networks they manage, and their partnered access capabilities and resources. Focused consideration within this analysis included investments in resources and the efficiency of the delivery organization.

**Table 1: Ability to Execute Evaluation Criteria**

Evaluation Criteria ↓	Weighting ↓
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	High
Market Responsiveness/Record	Medium
Marketing Execution	Low
Customer Experience	High
Operations	High

Source: Gartner (March 2021)

## Completeness of Vision

Gartner evaluates service providers on their ability to articulate logical statements convincingly about the market's current and future direction, innovations, customer needs, and competitive forces, and on how well these correspond to Gartner's position. Ultimately, we rate providers on their understanding of how they can exploit market forces to create opportunities for their organizations.

Completeness of Vision is judged using eight main criteria. Each criterion is described below, and its respective weighting is shown in Table 2.

### **Market Understanding**

For this criterion, we assess each provider's global view of the managed IoT connectivity service market. We evaluate how each provider is working to serve the main requirements of MNCs. We also look at the main effect that new connectivity requirements, delivery platforms and protocol support requirements are likely to have on each provider's business and offerings in the short term and medium term. Focused consideration within this analysis included a review of existing and planned value-added services, ranging from service management, device management, application development and management to data management and analytics.

### **Marketing Strategy**

For this criterion, we assess each provider's main marketing messages relating to managed IoT connectivity services. In particular, we consider:

- Current and future value propositions for managed IoT connectivity services
- The importance of IoT connectivity services within the provider's broader portfolio of business and capabilities
- Channels for internal and external communications
- The differentiation of a provider's message from its competitors' messages

### **Sales Strategy**

For this category, we require each provider to illustrate its overall sales strategy for managed IoT connectivity services. This includes its reactive answers to RFPs as compared with its proactive activities, its stand-alone offerings as compared with offerings bundled with other services, and its dedicated sales force as compared with its general sales force. In particular, we consider:

- The number of dedicated managed IoT connectivity services sales personnel globally
- Countries covered by direct local teams, as opposed to centralized teams
- Client retention rate

### **Offering (Product) Strategy**

For this criterion, we assess the offering based on the most important aspects of the service offering that differentiates it in the market and delivers value to its clients. In particular, we consider each provider's:

- Ability to both integrate client requirements and support global business process flows
- Ability to extend value-added IT services to support its clients' global connected solutions

- Approach to combining standard service elements into customized service delivery, including partnered capabilities, to provide flexible, low-cost and cloud-enabled service offerings

## **Business Model**

For this criterion, we assess each provider's high-level description of its business model for managed IoT connectivity services and an explanation in terms of how this fits within its overall business model. To evaluate how well each provider's business model addresses account management, we asked for information about:

- The structure of the management teams used to support and manage customers.
- Processes to address customer issues locally, as compared with centrally, including customers' access both to an appropriate level of management within the service provider and to escalation procedures.
- Reference customers' judgment about their provider's business model, including account management and service delivery, and we factored their answers into our evaluation. Additionally, we considered feedback received in Gartner customer inquiry calls.

## **Vertical/Industry Strategy**

For this criterion, we assess each provider's strategy to direct resources, skills and offerings to meet the specific needs of individual market sectors. In particular, we consider each service provider's:

- Penetration of different industries for managed IoT connectivity services
- Past performance evidence relating to the breadth and depth of sector-specific use cases based on managed IoT connectivity services

## **Innovation**

For this criterion, we assess each provider's position in the market as a thought leader and an innovator. We also evaluate how each provider establishes leadership, including the investment activities to achieve its vision, and how the provider develops innovative strategies in the managed IoT connectivity service market. In particular, we asked providers to answer the following questions:

- What investments is your company making to sustain and enhance its vision for innovative managed IoT connectivity services?
- What global alliances do you have with other leading suppliers, and what investments support these alliances?

We also asked reference customers for their judgment of their provider's ability to innovate (including the technical aspects of innovation). This also includes the ability to lower costs and to improve service by delivering innovative utility-based services, and degrees of responsiveness and proactivity, adaptability, and service flexibility.

### Geographic Strategy

For this criterion, we assess each vendor's regional and global capabilities, as well as local alliances and partnerships, including:

- Relationships with product and service providers to add value, provide full-service solutions or bring innovation closer to clients
- How each provider takes responsibility for managing the service delivered, even when using subcontractors or partners

We also asked reference customers for their feedback about local capabilities and the current or potential effects of consolidation and global delivery processes.

**Table 2: Completeness of Vision Evaluation Criteria**

Evaluation Criteria ↓	Weighting ↓
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	High
Offering (Product) Strategy	High
Business Model	Medium
Vertical/Industry Strategy	High
Innovation	High
Geographic Strategy	High

Source: Gartner (March 2021)

### Quadrant Descriptions

## Leaders

Leaders invest in the future of IoT that includes a continuum of value from IoT edge devices to IoT platforms and related analytics. Leaders perform skillfully and often exceed expectations. Leaders have a clear vision of the market's direction and develop competencies to maintain their leadership. Leaders engage customers and provide value across multiple geographies. They shape the market, rather than follow it, and they often set the benchmark for market growth. Leaders have the size and scale (for example, operations, sales and marketing, formal bid, and product management) to pursue large panregional and multinational opportunities for IoT connectivity. They have established a robust and diverse ecosystem of technology alliances and service delivery partnerships spanning IT, OT and IoT to meet broad market requirements.

## Challengers

Challengers execute well today and maintain a sizable, geographically diverse installed base. However, they have a view of the market's direction that is not aligned with the biggest and most demanding customers. This can be in terms of the breadth of value, service delivery operations, or the continuum of investment for resources and value that a broader IoT platform and portfolio offer. Challengers in the market for managed IoT connectivity services need to be more aggressive in outlining and communicating their strategy for the future outside of their core focus on connectivity services and associated customer support. They must also be more aggressive in how they invest in innovative offerings. Innovative offerings include areas such as end-to-end IoT solutions predicated on the capabilities to offer a complete service-based IoT platform, or the market partnerships to resell and manage on the customer's behalf. Challengers must also work to extend into adjacent market capabilities, leveraging the experience gained to offer more value, and reduce the friction of adoption for their customers and prospects.

## Visionaries

Visionaries have a clear view of the market's requirements and direction. Visionaries focus on providing a broader continuum of value to meet future market needs and to effectively upsell and cross-sell within their installed base through trust and the extension of recognizable, iterative value. Visionaries expand their capabilities through acquisitions, internal development and, increasingly, robust partnering. Visionaries need to improve their ability to meet customer expectations through process improvement and service center investment. Visionaries also should onboard executives and personnel with valuable market experience. Where investment resources do not exist, Visionaries must work to extend through service delivery partnerships and technology alliances (for example, resell and OEM agreements). Additionally, Visionaries must work to expand their market focus through catalog expansion, sales force growth in key geographies, and/or industry-specific expansion to penetrate the market for global managed IoT connectivity services.

## Niche Players

Niche Players focus successfully on a constricted channel to market, a particular service, a particular set of industry markets, a limited number of regional markets or a combination of all of these strategies. The narrower focus of Niche Players may affect their ability to outperform or

innovate. Often, their revenue and installed base growth rates lag behind the market average, or they may be unprofitable or exhibit extremely low operating profits in a market that is enjoying relatively high margins. A provider can be successful in a single capability focused on a single market industry or segment, or a single geography, or selling through partners only. However, Niche Players may have difficulty expanding into alternative geographies or upselling broader value to their installed base. Niche Players are still very much viable providers of managed connectivity services for managed IoT connectivity and IoT use cases; however, users must be aware that broader IoT expansion may not be possible with these providers.

## Context

COVID-19 has accelerated digitization initiatives across enterprises where IoT plays a transformative role, not only for optimizing business processes but also for generating new business through connected products. However, multinational enterprises requiring managed IoT connectivity services across different countries and regions are still facing a number of challenges, such as:

- Lack of a homogeneous service across countries for certain IoT connectivity technologies such as NB-IoT or LTE-M and for certain capabilities such as MSI or sourcing and logistics.
- MNOs are still reluctant to adopt bring-your-own-connectivity scenarios or enable eSIM at scale beyond giving it to enterprises as an insurance policy in the automotive vertical.
- Connectivity is a commodity, and elements such as IoT connectivity platform simplification, integration, APIs, a vendor's partner ecosystem or managed services depth provide elements that enterprises need to assess to identify providers that could better serve regional or global deals.

At the same time, businesses are becoming more mature in the way they interoperate IoT and OT. However, many connected solutions are planned, deployed and maintained within invisible silos within business units, such as product marketing, or regional business units or operations and engineering.

I&O leaders must insert themselves in the process of solution and vendor selection to determine if providers of managed IoT connectivity services can also provide a broader, preintegrated IoT solution. This strategy will ensure the cost-effectiveness and security of these solutions, as well as potentially reduce the opportunity costs of due diligence.

This Magic Quadrant assesses the Ability to Execute and Completeness of Vision of 18 managed IoT connectivity service providers. I&O leaders building IoT-enabled businesses can use this information and analysis to help them select provider contracts that support critical functions and business objectives, as well as assess the provider for future capabilities as the enterprises work toward broader IoT solutions.

## Market Overview



## Market Growth Remains Solid Despite COVID-19, but the Purchasing Process Still Takes Several Months

Participants in this Magic Quadrant have shown a slight slow down in growth, mainly due to the impact of COVID-19, moving from an average double-digit growth above 20% in both revenue and connections reported in the last iteration to less than 18% in revenue and 15% in connections in this edition. The average annual cost per connection is slightly under \$15. This cost includes not only connectivity but also the rest of managed IoT connectivity and IoT services participants provide.

The process of purchasing managed IoT connectivity services still takes several months. It can span from three months with point solutions in industry verticals such as fleet management or global asset tracking to 18 months for complex large enterprise deals. It can take even longer in the automotive sector since vendors are required in the very early stages of the car design. For enterprises requiring just connectivity and that are familiar with IoT, it can take just weeks. Deployment time for large enterprises is still between six and seven months, on average.

## eSIM and 3GPP LPWA Networks (NB-IoT, LTE-M) Have Very Low Adoption Rates While “Platform of Platforms” Concept Arises

Enterprises are reporting to Gartner many challenges when trying to select a vendor that guarantees service in multiple regions for 3GPP LPWA technologies and even LTE. A typical scenario could be an enterprise manufacturing connected products in China that are delivered in multiple countries worldwide. In 3GPP LPWA networks, the main doubt is what type of modules to embed. No vendor is guaranteeing coverage or even the availability of an NB-IoT or LTE-M across all countries. This could be due to lack of roaming agreements or immaturity of the NB-IoT standard and deployment across different frequencies making interconnection for that technology a challenge for vendors. This is reflected in the low adoption of 3GPP LPWA network connections that most of the participants of this Magic Quadrant show.

In addition to that, the surge of video with high data throughputs for certain use cases such as video surveillance or transportation where aircrafts need to download big amounts of internal data in each airport hub makes roaming costs too expensive for global SIM cards. Enterprises need the global provider giving them the option of having local connectivity in their main countries. The lack of openness that MNOs show for eSIM as they want to keep the SIM card lock-in together with the high costs that eSIM service has due to lack of adoption are factors that influence the low adoption of eSIM that most of the participants in this Magic Quadrant show.

A nascent trend Gartner is observing in both enterprises and vendors is the “platform of platforms” concept. This concept is a wrapping layer with managed IoT connectivity platform capabilities placed on top of other platforms that are spread across different regions or countries. This architecture enables access to local connectivity in those countries or regions, including integration of existing service providers through APIs, eSIM or other means. It provides a single pane of glass to manage the IoT connectivity services where the connectivity itself is not necessarily the main strength of the vendor that provides the platform but integration capabilities and flexibility instead. This gives enterprises more flexibility to select local connectivity providers

without changing the way they integrate the life cycle management of the service and its integration with the rest of the enterprise IoT infrastructure.

## **Enterprises Are Looking for Managed IoT Connectivity Providers With Higher Integration With Hyperscalers for Their Connected Products**

As the market for edge solutions grows, CSPs appear to act more as resellers, or bundlers, of the hyperscaler's infrastructure as a service (IaaS) or platform as a service (PaaS) as well as the intelligence and the value of the edge workloads. At the same time, enterprises are looking for more simplicity in their managed IoT connectivity deployments and see hyperscalers or IoT platform providers as a real alternative for managed IoT connectivity services in the future. In the next five to 10 years, this simplicity will be brought by an integrated service from a single provider that has connectivity (5G) and processing (edge). A CSP will be able to deliver it if it orchestrates edge, and the hyperscaler and its non-CSP partners could deliver it if they become IoT MVNOs in their journey to 5G.

This scenario of reduced innovation coming from the CSPs represents a threat for the CSP dominance in the managed IoT connectivity services market. Adding urgency to this scenario is the looming threat of hyperscalers actively engaging the market in mobile core network infrastructure and related virtual network enablement capabilities. In March 2020, Microsoft announced the acquisition of Affirmed Networks,<sup>1</sup> which enables the company to offer fully virtualized, cloud-native mobile network solutions.

This opens up a new and disruptive scenario in the managed IoT connectivity services market where companies, such as Microsoft, may offer a truly end-to-end IoT proposition that spans the edge, network and cloud as a single, bundled solution. More importantly, in this scenario, Microsoft can enable a new type of service provider, a next-generation value-added reseller (VAR). These include system integrators, industry-vertical IoT SW companies or OEMs that can easily integrate connectivity in a flexible and modular proposition using the different components in the edge, the network and the cloud that Microsoft can offer (see [Tech Providers 2025: Edge Ecosystems Will Challenge CSPs' Dominance in Managed IoT Connectivity Services](#)). The first step for Microsoft was to announce Azure for operators.<sup>2</sup> This positions Microsoft as a full stack solution provider including four layers: interconnection, edge platform, network functions (that include packet core regarding IoT) and cloud. The only building block Microsoft is not providing is the radio access network in the network functions layer.

## **Cellular Data Costs Are Becoming an Increasing Burden for Automakers**

Automotive is the largest startup industry that vendors in this market serve, in terms of both annual spend and connections. In order to deliver new services to customers and remain competitive, automakers have been increasingly installing telematics hardware in vehicles.

Automakers are collecting data to enable the provision of connected vehicle services or to make improvements to core-vehicle functions. However, the volume of data to support these two applications varies significantly depending on the sophistication of vehicles, which can be

measured using Society of Automotive Engineers (SAE) levels of vehicle autonomy. Note 3 provides more information for readers not familiar with the SAE levels.

In terms of total connections, connected vehicles are the most important IoT use case. Gartner's [IoT Forecast Tool](#) shows that, by the end of 2020, over 230 million vehicles will have an embedded cellular connection, rising to over 800 million by 2029. This growth in connected vehicles, combined with the increasing amount of data being collected at a vehicle level and the fact that automakers can be charged anywhere from €1 to over €15 per gigabyte for data (depending on geography) shows how cellular data costs are becoming an increasing burden for automakers. Traditionally, automakers have tended to negotiate vehicle-level pay-per-use contracts with CSPs. Some automakers do purchase a bundled cellular data allowance and benefit from lower prices per megabyte; however, to avoid becoming responsible for additional charges if bundles are exceeded, there is a need to overpurchase data, which could lead to the automaker paying too much overall.

Automakers will increasingly seek to deliver new direct and indirect monetization across their vehicle fleets by sending software updates to vehicles over the air (OTA). These data files can more than double the monthly cellular data volumes a vehicle will consume. Automakers currently purchase additional data bundles to deliver specific OTA software or firmware updates, but as OTAs become more frequent (see [Three Ways Automakers Can Successfully Deliver Over-the-Air Updates](#)), this approach will become less tenable.

What I&O leaders in the automotive industry can expect from managed IoT connectivity providers in the way they are responding to these changing market dynamics in a number of ways is:

- Increasingly, in-vehicle connectivity is being delivered using a single SIM. Connectivity providers are then using dual and hybrid APNs to enable companies to classify traffic as it goes across the network and offer split and itemized billing to customers. This functionality supports B2B2C use cases and enables end consumers to pay for data that is used by a vehicle Wi-Fi hot spot, for example. It also enables traffic to be prioritized to ensure that high quality of service is delivered for bandwidth-intensive use cases such as voice calls or music and video streaming into the vehicle.
- End-customer-facing portals to help vehicle owners purchase and manage their data allowance are being offered by IoT connectivity providers. For example, Deutsche Telekom's HotSpot Drive platform even allows users to sign in using their BMW ConnectedDrive online credentials to transfer data into the platform, streamlining the registration process.
- Cellular connectivity providers offer a range of different data settlement allowance intervals including daily, monthly, quarterly and biannually. For very predictable services (such as eCall), this can be a one-off fee for the contract period per car.
- Historically, automakers put in place regional contracts with IoT connectivity providers, even sometimes at a vehicle-model level. However, there is a growing desire for automakers to reduce the numbers of vendors that they are handling and develop global partnerships. So, as

the cellular data volume that vehicles consume increases, IoT connectivity providers are looking for partnerships rather than transactional relationships to enable more innovative ways to help automakers better manage their cost base. For example, NTT Group's Transatel is helping automakers to become MVNOs themselves to build an optimized and scalable connectivity solution. And, in the U.S., VW Group has contracted with Verizon and T-Mobile for its connectivity, but VW's SIM and subscription management is all managed by Cubic's platform. Bring-your-own connectivity is something that Aeris supports, too.

- Vehicle owners are being given the ability to control which IoT connectivity provider they use for services they purchase. VW has worked with Cubic Telecom to enable its U.S. customers to choose their connectivity provider. This means vehicle owners can now switch between Verizon Wireless and T-Mobile and link their vehicle data consumption to their shared (smartphone) data plan.

## Evidence

<sup>1</sup> [Microsoft Announces Agreement to Acquire Affirmed Networks to Deliver New Opportunities for a Global 5G Ecosystem](#), Microsoft.

[Microsoft partners with the telecommunications industry to roll out 5G and more](#), Microsoft.

## Note 1: Distinguishing Managed IoT Connectivity Services and IoT

The technology and service functions defined below fulfill critical parts of typical IoT solutions with a particular focus on the "IoT edge," which encompasses IoT endpoints, gateways, edge computing and connectivity services. Many providers in this Magic Quadrant have moved away from references to machine to machine (M2M) in their messaging and catalog descriptions to create the perception that their solutions are more "IoT-aligned," labeling their solutions as "IoT solutions." In fact, most have changed their business unit names to include IoT in the title. The market for managed IoT connectivity services is mature and doesn't present the attention and buzz of broader IoT solutions. These rebranding efforts are meant to convey broader solution value to the market. However, relabeling their offers and business units to "IoT" or "IoT connectivity" does not make their solutions IoT solutions.

While not explicitly codified, what distinguishes typical managed IoT connectivity solutions from IoT solutions is the existence of broader platform capabilities in an IoT solution. An example includes the capability for IoT endpoint and device management, where most vendors in this Magic Quadrant manage the SIM card and related data, rather than IoT edge device OSs and agents and other management capabilities. Also, offerings and definitions for IoT solutions include an application enablement and management capability within the IoT platform (see [Magic Quadrant for Industrial IoT Platforms](#) for a further discussion on the components comprising an IoT solution). A key offering of competitive IoT solutions and platforms in the market also focuses on integration capabilities. Examples include integration platform as a service (iPaaS), API management, various software development kits (SDKs), and software connectors and extensions to facilitate integration and interoperability with third-party software and applications.

Increasingly, we see CSPs and MVNOs choosing to ignore the build-out of broader and higher-value IoT platforms. Rather, they favor creating and acquiring IoT vertical applications (such as fleet management, and smart meter and energy demand management), which can be integrated into enterprise applications. Without a broader, true IoT platform, CSPs and MVNOs are forced to sell these vertical applications as point services that require the user to explore, validate and acquire IoT platform elements, such as device management and data management. This happens when these point solutions don't cover the enterprise use case beyond the horizontal connectivity and value added such as security or managed services these vendors provide.

## **Note 2: Provider Models**

### **Communications Service Providers**

CSPs typically bundle connectivity services (such as cellular, LTE and connectivity management). However, some providers offer cloud-based IoT platforms that are composed of messaging, device management, and storage and base-level analytics (utilization reporting and asset tracking). The enterprise service organization of some CSPs amortize device charges across the term of an agreement as a recurring add-on charge. Additionally, some providers offer application enablement platforms and a modest catalog of vertical applications (most commonly, fleet management and asset monitoring). For noncellular use cases, most CSPs provide managed services for wireless LAN (WLAN), some LPWA networks (3GPP and non-3GPP), limited satellite and managed security services for IoT gateways. Most CSPs have created access partnerships to augment their global IoT connectivity management capabilities. Examples of this type of provider include AT&T and Vodafone.

### **Mobile Virtual Network Operators**

The immediate value that MVNOs bring to customers is the aggregation and management of multiple CSP networks to provide regional and global connectivity coverage. Additionally, as with the CSPs, hosted and cloud-based connectivity management applications provide users with device metadata and status information and diagnostics information. The management platform also extends to users the self-management capabilities, such as SIM management actions for bulk operations on many devices. Some IoT MVNOs have been acquired by CSPs to address specific segments and verticals to complement their IoT capabilities. Examples of this type of provider include Aeris and KORE.

### **Hardware Module Manufacturers and Hardware Intellectual Property Companies**

Traditional hardware module manufacturers and hardware intellectual property companies are shifting their strategies to leverage their hardware (or hardware they power) and bundle it with connectivity, cloud access, device management and, in some cases, data management. This strategy brings to hardware-related manufacturers the ability to provide powerful device management capabilities on top of managed IoT connectivity services. Due to their hardware capabilities, these vendors integrate some device and data management capabilities into their own connectivity platforms. These vendors try to tie customers to their own hardware-related modules, so the offer can be reduced when not using their own hardware or hardware modules they power. Examples of this type of provider include Arm and Sierra Wireless.

## IT Outsourcers and Integrators

These providers offer traditional IT outsourcing and managed IT services, but they now have practices that focus on delivering managed and professional services for IoT technology management. Many of these providers enter the IoT solution market with the advantage of legacy vertical-centric go-to-market (GTM) structures that provide subject matter expertise presale and postsale. Many of these providers also own vertical-centric back-office applications (such as manufacturing execution systems and insurance industry applications) that will leverage IoT data. The number of IT outsourcers and integrators that maintain and manage MVNO operations is still small but is increasing slowly. As managed IoT service adoption increases in the market, and the price to build and manage MVNO capabilities decreases because of cloud and virtualized technologies, the number is expected to increase over the next three to five years. Examples of this type of provider include Accenture and Fujitsu.

## OT and IT Vendors

These providers bring a unique body of knowledge to CIOs and business leaders planning and building IoT solutions. Their core business, in terms of revenue, is the manufacturing of non-IT products and systems, with some also manufacturing and developing OT and IT technologies. This broad vertical and horizontal perspective is a solid platform on which to build robust and expansive IoT businesses. To date, most focus on extending managed IoT platforms in conjunction with vertical-centric IoT applications, such as enterprise asset management (EAM) or asset performance management (APM). However, many of these companies recognize that leveraging partner-based IT and OT service delivery is not sufficient for customer demand and preference. Consequently, they are rapidly building IoT life cycle service organizations with relevant IT service catalogs that span consulting and advisory services to business process outsourcing. These providers are going to market with an IoT platform (or elements of an IoT platform) and managed connectivity services. Thus, they are able to change their business model away from selling products as nonrecurring capital events to products as an operational expense (IoT product as a service). Examples of this type of provider include Honeywell and Siemens.

## Dedicated IoT Network Providers

This segment represents providers based on public and private networks in the unlicensed spectrum. These providers sometimes manufacture their own IoT edge equipment and develop their own IoT platforms and IoT vertical applications. These providers present focused offerings, usually predicated on some use cases such as automated meter infrastructure, fleet management, smart parking and smart lighting. While there is no stand-alone company from this category this year, an example of such a provider from previous documents is Silver Spring Networks. The company was acquired by Itron, which is included in this document. Another example is companies that only manage LoRa networks, or Sigfox, both types of vendors providing non-3GPP LPWA networks.

## Note 3: Autonomous Driving Levels

The SAE devised six autonomous driving levels to describe the level of complexity and sophistication of vehicles. Vehicles at Level 0 have no automation, and Levels 1 and 2 provide an

advanced driver assistance system (ADAS) that can control steering and braking/accelerating; however, importantly, the human driver needs to monitor and, if necessary, override the autonomous system.

According to the National Highway Traffic Safety Administration, levels of autonomous driving technology and their definitions are outlined as follows:

- Level 0: The human driver does all the driving.
- Level 1: An ADAS on the vehicle can sometimes assist the human driver with either steering or braking/accelerating, but not both simultaneously.
- Level 2: An ADAS on the vehicle can itself actually control both steering and braking/accelerating simultaneously under some circumstances. The human driver must continue to pay full attention (monitor the driving environment) at all times and perform the rest of the driving task.
- Level 3: An Automated Driving System (ADS) on the vehicle can itself perform all aspects of the driving task under some circumstances. In those circumstances, the human driver must be ready to take back control at any time when the ADS requests the human driver to do so. In all other circumstances, the human driver performs the driving task.
- Level 4: An ADS on the vehicle can itself perform all driving tasks and monitor the driving environment – essentially, do all the driving – in certain circumstances. The human need not pay attention in those circumstances.
- Level 5: An ADS on the vehicle can do all the driving in all circumstances. The human occupants are just passengers and need never be involved in driving.

## Evaluation Criteria Definitions

### Ability to Execute

**Product/Service:** Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

**Overall Viability:** Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

**Sales Execution/Pricing:** The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

**Market Responsiveness/Record:** Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

**Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

**Customer Experience:** Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

**Operations:** The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

## Completeness of Vision

**Market Understanding:** Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

**Marketing Strategy:** A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

**Sales Strategy:** The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

**Offering (Product) Strategy:** The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

**Business Model:** The soundness and logic of the vendor's underlying business proposition.

**Vertical/Industry Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

**Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.



**Geographic Strategy:** The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.

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