Magic Quadrant for Full Life Cycle API Management

Published 9 October 2019 - ID G00362155 - 86 min read

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API usage is growing very rapidly, driven by digital transformations, platforms, ecosystems, innovations and regulations. Now that API life cycle management is essential, this Magic Quadrant assesses a wide range of vendors to help you make the right choice for your organization.

Market Definition/Description

> **Effective API programs lay the foundations for digital transformation by enabling organizations to build a platform and develop an ecosystem.**

Application programming interface (API) programs play a crucial role in supporting digital transformation and innovation by enabling platform and ecosystem business models and agile business processes (see "Digital Disruption Profile: APIs and the API Economy"). They also may play a role in industry regulations such as the Second Payment Services Directive (PSD2) for European banks and similar payment regulations around the world. Consequently, how to use and manage APIs is of great interest to organizations, as is reflected in the high volume of inquiries Gartner receives on this subject.

API programs cannot run effectively without full life cycle API management.

The number of APIs within organizations is growing very rapidly in IT departments, but also within lines of business (LOBs). Every connected mobile app, every website that tracks users or provides a rich user experience, and every application deployed on a cloud service uses APIs. APIs are the connection points between platforms and ecosystems. LOBs see them as a way to innovate quickly, which enables them to disrupt markets and competitors by introducing new offerings or new channels (see "Digital Disruption Profile: APIs and the API Economy"). There are different deployment models. A company may, for example, provide free (but often not public) access to its APIs in return for quicker, more efficient execution of a business process, such as the ordering of goods in a supply chain. Or it might do so to facilitate or increase sales of a traditional product — travel companies, for instance, get more bookings if they publish APIs linking to their reservation systems (see "Choose the Right API Monetization and Pricing Model").

Expect the already widespread usage of APIs to increase even more rapidly in future.

Having the right API management tool is crucial for managing API complexity.

Today's full life cycle API management involves:

- The planning, design, implementation, testing, publication, operation, consumption, maintenance, versioning and retirement of APIs
- Delivery of a developer portal through which to target, market to and govern communities of developers who embed APIs
- Runtime management

- Estimation of APIs' value
- The use of analytics to understand patterns of API usage

Basic API management involves the use of an API gateway, and in most cases an API developer portal. Full life cycle API management, as defined above, adds to it considerably.

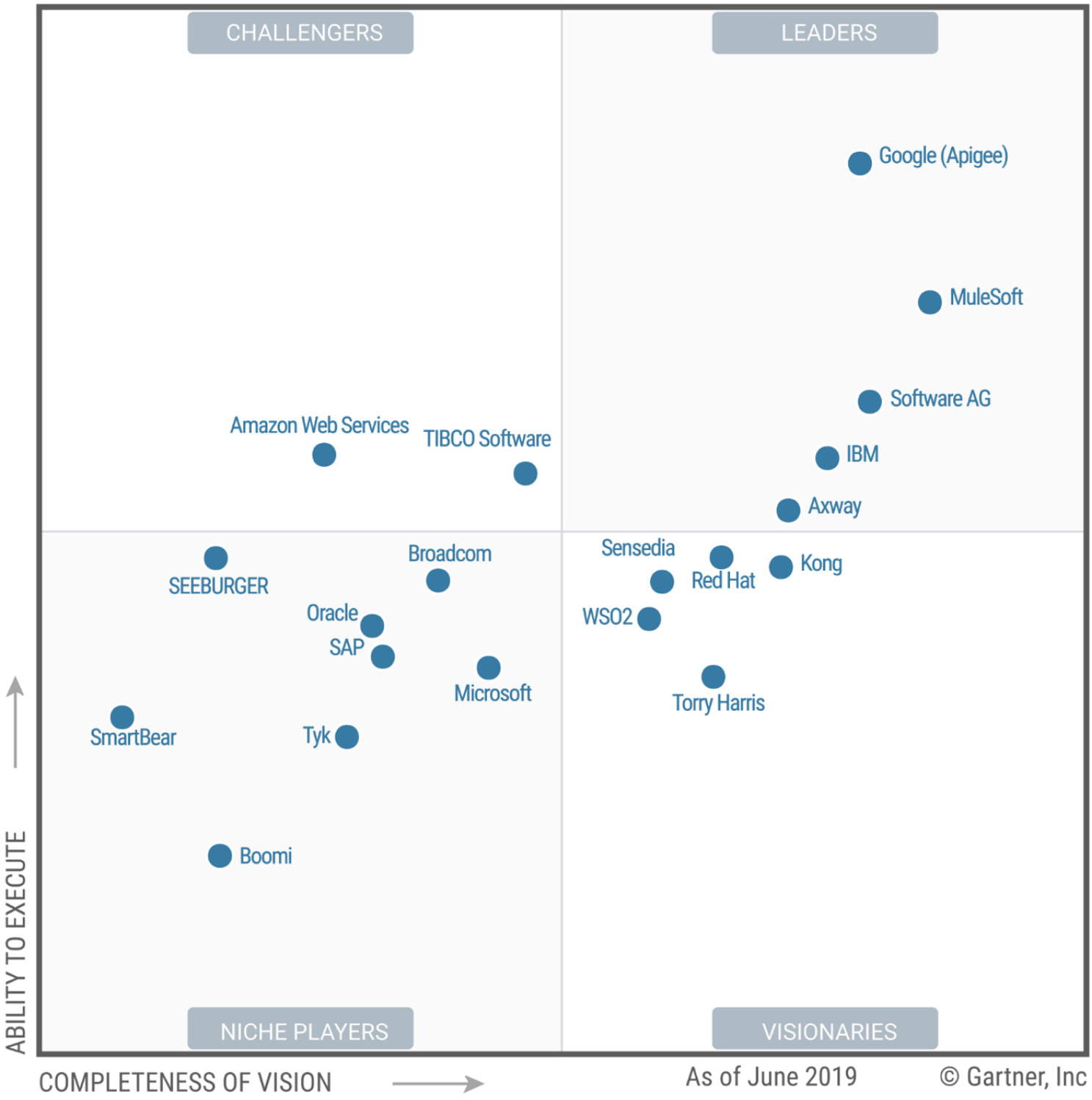
> **API management products are evolving to meet the more sophisticated needs of users.**

API management platforms have matured in the past few years. They now have more sophisticated API security features (see "API Security: What You Need to Do to Protect Your APIs"). They can also work with and take advantage of microservices in mesh app and service architectures (see "Adopt a Mesh App and Service Architecture to Power Your Digital Business"), digital transformation tools focused on API product managers and much more. As market demands have evolved rapidly, so have vendors, but each at its own pace. There has also been an evolution in buying centers, with LOBs now also buying API management, which may lead to duplication of effort within organizations.

This Magic Quadrant provides key insights into the strengths and challenges of the major vendors in the full life cycle API management market.

Magic Quadrant

Figure 1. Magic Quadrant for Full Life Cycle API Management



Source: Gartner (October 2019)

Vendor Strengths and Cautions

Amazon Web Services

Amazon Web Services (AWS) offers Amazon API Gateway, which it launched in 2015 as a fully managed service to enable developers to publish, maintain, monitor and secure APIs at any scale. The Amazon API Gateway team is part of a growing serverless organization. For AWS, an obvious cloud leader that is still growing fast, API management functionality is a reasonably important part of the product portfolio, and the Amazon API Gateway reflects AWS's growing serverless agenda. It is aimed directly at developers building serverless applications on AWS infrastructure and using its gateway to invoke functions.

Amazon API Gateway is a cloud-only and serverless offering. AWS provides an open-source reference implementation for a serverless developer portal that integrates with Amazon API Gateway. The gateway is frequently used in conjunction with other serverless AWS products, such as AWS Lambda, Amazon Cognito (for identity management), Amazon Kinesis (an event-streaming managed service) and the Amazon suite of container services.

Amazon API Gateway is available in 23 AWS regions around the world. Gartner believes that its customers are primarily in the U.S., but it also has significant presence in Europe and Asia.

Strengths

- In 2018, AWS's revenue from Amazon API Gateway grew by a market-leading 160% year over year, far above the market average of 31%.
- Amazon API Gateway is a low-cost offering — you pay for the API traffic you use, and if you don't use any, you don't pay. It's also efficient and performs at any scale. Via a wizard, Amazon API Gateway presents itself as a natural, immediate follow-on for users of AWS Lambda and other AWS platform as a service (PaaS) offerings.
- As a straightforward follow-on from AWS Lambda, Amazon API Gateway is fairly well known to API management user communities and system integrators, despite merely modest investments by AWS in its international marketing and sales operations.

Cautions

- AWS's offering is largely driven by its serverless agenda and the predominance of Lambda developers' priorities relating to it. It's unlikely to evolve around the main drivers of digital

transformations, in contrast to several other offerings from vendors in this market.

- AWS doesn't offer a customer-managed gateway, which is critical technology for many organizations operating in highly secured and restricted on-premises environments. However, its AWS Outposts offering, which provides AWS services on-premises (managed, maintained and supported by AWS), is in preview at the time of writing.
- Amazon API Gateway is still evolving. It still lacks advanced deploy and run capabilities to support exhaustive monetization capabilities, and its developer portal has a limited feature set for creating and nurturing an API ecosystem.

Axway

Axway has a long history in application integration, B2B software and services. Its API management offering, AMPLIFY API Management, is a part of the AMPLIFY platform, which also includes mobile back-end services, an integration PaaS (iPaaS), a B2B gateway, managed file transfer (MFT) and content collaboration. In March 2019, Axway acquired Streamdata.io in order to offer event-driven API options to its customers. AMPLIFY API Management is available as SaaS, as a hybrid/distributed deployment, as a managed instance in a public cloud, as a private cluster in a public cloud, and as a customer-managed instance in a private cloud or on-premises.

AMPLIFY API Management includes the API Builder tool, as well as an API gateway and an API developer portal. This enables rapid API creation in front of data sources and, through an OEM partnership with Cloud Elements, API integration with a broad range of commonly used cloud apps and services. An embedded analytics capability identifies abnormal situations and enables customization of metrics and dashboards. The AMPLIFY Central service, introduced in 2017 and built on the AMPLIFY cloud platform, is a public cloud service that enables management of a central catalog of APIs and a library of policies. The control plane of the AMPLIFY API Management platform, which can be either SaaS-based or deployed on-premises, controls deployment of policies and microgateways (Envoy-based proxies).

Axway's offering has clients worldwide.

Strengths

- Axway is a diversified vendor with an extensive product line and effective sales strategies for many locations.

- Axway has improved its vision significantly, and is enhancing its support for microservices with highly integrated service mesh capabilities built into its API management offering. However, the offering is still in beta testing at the time of writing.
- Axway's partnership with Cloud Elements enables it to offer new cloud adapters. These are especially useful for organizations that want to manage outbound connections to third-party APIs from cloud/SaaS providers.

Cautions

- Axway's revenue declined by 3.6% in 2018 as its business model began to shift from primarily license and maintenance business to subscription business. However, AMPLIFY and its fundamental components have provided the basis for new product launches in 2019, and in the first quarter of 2019 the company registered organic growth of 2%.
- Axway partners with various vendors to support different stages in an API's life cycle, which may mean it provides a less-than-seamless experience to users. Surveyed reference customers for Axway expressed dissatisfaction with its platform's ease of use and general operational features. However, Axway's Unified Catalog offering aims to bring together artifacts from different product lines.
- Axway's AMPLIFY API Management offering is powerful and feature-rich, but to harness its power customers must surmount a long learning curve and invest in internal resources, unless they use the managed-service option.

Boomi

Boomi is a wholly owned subsidiary of Dell Technologies. It recently made a self-standing API management offering available, in addition to integration API design and publish capabilities (the latter called API Publish), as part of a multipurpose PaaS called AtomSphere. In addition to API management, AtomSphere provides iPaaS, master data management (MDM), B2B integration and low-code development capabilities.

Boomi API Management includes an API proxy to govern APIs housed outside Boomi, an authentication broker to facilitate broader authentication and interaction with third-party identity providers, and an API gateway to facilitate governance and security of APIs. It also includes an API catalog for internal consumer engagement, an API developer portal for external consumer

engagement, application registration and administration of associated keys for provisioned APIs, and usage reporting through platform APIs and dashboards.

Boomi's API management offering is sold directly in North America, Western Europe, Australia, Singapore, Hong Kong and Japan.

Strengths

- By providing API management as part of an overall PaaS that also provides integration, MDM, low-code development and B2B capabilities, Boomi enables customers to manage APIs in the same platform in which they create APIs.
- Boomi includes support for B2B and electronic data interchange (EDI) standards, such as ANSI X12 and UN/EDIFACT (the United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport). This means that its platform can be used to enable APIs alongside traditional B2B protocols.
- Boomi has expanded its international sales operations, which now compete directly in a number of countries. It has a strong and growing partner network, with over 320 global and regional partners.

Cautions

- Boomi released its new API management offering (including API proxy, API gateway and developer portal) into early access for select customers and partners in the first quarter of 2019. The product has since entered general availability during the weeks prior to the publication of this Magic Quadrant, but still needs to be proven by wide market usage.
- Boomi focuses primarily on the integration aspects of API management, with standard features such as traffic throttling. It's not intended for API programs with simple, non-integration-specific APIs, which sometimes occur at the start of business-driven digital transformations.
- Boomi's functionality for the later stages of the API life cycle is limited to manual versioning of APIs, based on paths, and standard API retirement options.

Broadcom

Broadcom, a global technology company that designs, develops and supplies semiconductor and

data center infrastructure solutions, announced the completion of its acquisition of CA Technologies in November 2018. CA had a proven, fully featured and mature offering for API management, which Broadcom has renamed the Layer7 API Management platform. It includes Layer7 Live API Creator (for building APIs for internal applications, mobile development projects, data-as-a-service exposure, Internet of Things [IoT] enablement and partner application integrations), Layer7 API Gateway, Layer7 Mobile API Gateway, Layer7 API Developer Portal and Layer7 Microgateway. It offers its product line for fully on-premises deployment, which most of its customers use, but also offers an option to deploy its products on a cloud-only or hybrid basis.

Broadcom positions Layer7 API Management as a tool its clients can use to gain the connectivity, security and system agility required to build a digital business that is scalable and that delivers digital initiatives faster.

Broadcom sells worldwide directly to its top 1,000 global accounts, and indirectly through partners to all its other customers.

Strengths

- Broadcom's impressive size, geographic coverage and highly consolidated way of addressing its top 1,000 global accounts represent a very solid business model. It sells to these accounts via a Portfolio License Agreement for enterprise software that prioritizes successful portfolio adoption, enables synergies across product lines, and includes differentiated API life cycle capabilities.
- Broadcom has a comprehensive and powerful offering. It has solid security features and good coverage of basic and advanced functionality for the full life cycle of API management.
- Broadcom's offering is highly visible and generally well known, thanks to years of effective and carefully targeted marketing by CA.

Cautions

- Broadcom's acquisition of CA represents a significant shift for a key player in the enterprise software market. Existing and prospective customers must align their investments with CA's new structure under Broadcom, which includes notable changes to its customer focus and licensing models.

- Some surveyed reference customers for Broadcom's API management product line expressed dissatisfaction with the vendor's service and support, with its ability to understand their organization's needs, and with their overall experience with the vendor.
- Broadcom's market understanding and marketing messages are largely unchanged from when CA was identified as a Leader in the 2018 Magic Quadrant. This mainly reflects significant shifts and consequential changes in the company, as mentioned in the first Caution above.

Google (Apigee)

Apigee is part of Google Cloud and contributes part of the Google Cloud Platform, for which there have been some notable leadership and management changes recently. Since the last Magic Quadrant, Apigee has added new integration features, including adapters called Apigee Extensions, one of which is a new Salesforce adapter.

The core Apigee API management platform, Apigee Edge, is available both on-premises and in the cloud, as well as for hybrid and multicloud scenarios. Google Cloud also provides Apigee Compass, a self-assessment tool for digital strategy maturity. Apigee Sense — a cloud-only layer of API security that identifies and alerts administrators to suspicious API usage patterns — and an API monetization capability complete the offering. Apigee Edge supports the ability to enforce API management policies natively inside an Istio service mesh. This is achieved by using an Envoy sidecar proxy as the policy enforcement point. Apigee also provides a microgateway based on Node.js.

Google Cloud's Apigee team markets its offering as a cross-cloud API platform and as a platform for digital business. Most clients of Google (Apigee) are in the U.S., Europe, Australia and New Zealand.

Strengths

- Google (Apigee) continues to differentiate itself through its support for customers pursuing digital strategies. For example, it supports the building of ecosystems based on APIs.
- Users of Gartner's client inquiry service often have a positive view of Google's Apigee team as a strategic partner for digital transformation, not just as a provider of technology solutions. In this market, the ability to act as such a partner can prove a significant competitive advantage.

- Users frequently identify ease of use as a key benefit of the Apigee Edge platform.

Cautions

- Google's recent move to address middleware use cases is an initial step into the integration market. It remains to be seen how it will compete on these terms against API management vendors that are strong on integration.
- Prices for the Apigee platform are higher than those for most competing closed- or open-source offerings or API management solutions from other cloud providers. However, most of those solutions have considerably less functionality.
- Google views API management mainly as a hybrid. It's simple to use Apigee Edge as a cloud service, but complex to deploy it on-premises. Also, the cost of an on-premises installation has the potential to rise very rapidly.

IBM

IBM introduced its first offering for this market, IBM API Management, in 2012. This product focused on API management and required the use of the traditional IBM DataPower Multi-Protocol Gateway service for API security. The big news regarding API Connect, the current API management product, is that, in 2018, IBM built a new OpenAPI-based API gateway service, architected for much higher performance and multicloud scale (which means it can run on the customer's choice of cloud). On both a stand-alone basis and as part of API Connect, IBM DataPower Gateway delivers both the DataPower Multi-Protocol Gateway service and the new API Gateway service in a single offering.

API Connect is available both on-premises and as cloud SaaS. It is sold worldwide.

Note: IBM completed its acquisition of Red Hat on 9 July 2019, after the cut-off date for this Magic Quadrant. Both IBM and Red Hat met the inclusion criteria for this Magic Quadrant as of June 2019, and are expected to continue operating as before; IBM has said that it "will preserve Red Hat's independence and neutrality." Gartner will provide additional insight as more details become available.

Strengths

- IBM has an established and powerful position in this market, with solid customer bases in several industries. It has worldwide support capabilities and diversified geographical strategies.
- In 2018, IBM rearchitected API Connect for multicloud deployments. Initial support includes managed SaaS on AWS, Google Cloud Platform, Microsoft (Azure) and on-premises. The management tier (comprising API Manager and Developer Portal) runs on IBM Cloud as a managed service. In 2019, API Connect will integrate more closely with third-party clouds chosen by clients.
- API Connect benefits from IBM's global presence in over 170 countries through its own local staff and those of partners. This offering supports the following languages: English, Chinese (Simplified Han and Traditional Han scripts), Czech, Dutch, French, German, Italian, Japanese, Korean, Polish, Portuguese (Brazilian), Russian, Spanish and Turkish.

Cautions

- IBM's understanding of the API management market, like its marketing strategy, is very specific to integration architecture and highly product-based. In today's market, however, organizations have digital transformations to undertake and ecosystems to build, which means marketing messages focused on product offerings are likely to fail to resonate with customers' top priorities.
- Although IBM has been a leading proponent of digital transformation, API Connect has yet to provide flexible and business-oriented value-rating features for customers wanting to quantify APIs' value in terms of more than usage. Also, Stripe, IBM's partner for API monetization, has only partial coverage of regions and business practices outside North America.
- IBM's new API gateway service represents a generational change from the established DataPower Multi-Protocol Gateway service. Depending on the product versions and gateway policies in use, migrating API volumes from the latter to the former might not be totally automatic.

Kong

Kong started out as Mashape in 2010, when it sold a global API marketplace. In 2015, the company started shipping an API gateway called Kong. In 2017, the company rebranded itself as Kong and divested itself of the Mashape API marketplace, which now forms the core of RapidAPI's

offering. Kong now focuses on its API management offering.

Kong's open-source API gateway for REST APIs is based on NGINX with OpenResty. Kong refers to its solution as a "service control platform." In addition to service routing for microservices and APIs, the solution includes Kong Vitals (for monitoring the Kong platform itself). It also includes Kong Brain and Kong Immunity, which use artificial intelligence (AI) and machine learning to help automate the API and service development life cycle. Very recently, Kong announced the general availability of Kuma, a platform-agnostic control plane to orchestrate Level 4 and Level 7 traffic; it includes microservices and a service mesh, built on top of Envoy.

Kong's solution is available both on-premises and in the cloud. Over 100 enterprise customers use it. Kong mainly targets customers in North America, Western Europe, Japan, Australia and Singapore.

Strengths

- Kong is growing very fast, and its offering for enterprises is maturing very rapidly.
- Kong's API management platform is attractively lean. It should appeal to users with basic requirements who want to purchase an initial platform that they can enrich as they go with additions from Kong, a wide range of community-provided plug-ins or developments of their own.
- Kong's gateways can be deployed in a variety of configurations. For organizations with a distributed set of microservices and APIs, Kong provides an architecture to manage APIs that isn't limited to a single monolithic API gateway.

Cautions

- Kong replaced its previous API portal offering, Gelato, with a new, Kong-developed API portal in 2019. It also replaced its previous monitoring tool, Galileo, with Kong Vitals. Such swift changes are signs of a developing platform and might prove disruptive.
- Kong is one of only a few remaining independent API management platform vendors, and it uses investor funding to fuel its growth. This makes it an attractive target for acquisition by a larger company.
- Kong successfully focuses on developers as prospective users of its API management

platform. Users looking to execute digital strategies will find Kong useful for enabling their API rich platforms, but will need much more — including business analytics, API monetization and ecosystem enablement — to get an ecosystem up and running and execute digital transformations.

Microsoft

Microsoft's Azure API Management offering was created by Apiphany, which Microsoft acquired in 2013 and then integrated into the Azure platform. Azure API Management became generally available in September 2014.

Azure API Management is a cloud-only service offering. It enables organizations to publish APIs securely, reliably and at scale. It's designed to increase API consumption by internal teams, partners and developers. An administrator portal enables customers to provision user roles, create usage plans and quotas, apply policies for transforming payloads and throttling, and use analytics, monitoring and alerting. Azure API Management is available in four main tiers — Developer, Basic, Standard and Premium (which permits multiregion deployment) — for which users are charged a fixed hourly fee, based on allocated resources and feature set. An additional consumption tier will support API call-based pricing, but is still in preview on a limited geographic scale at the time of writing.

Azure API Management is available in 40 public cloud regions in the Americas, Europe, Asia, Africa and Australia, and six U.S. Government and Department of Defense regions. Most of its customers are in the U.S. and Europe.

Strengths

- Microsoft Azure API Management is low-cost — you pay for what API volume you use, and if you don't use, you don't pay. It's also widely available across the world and supported in nine languages. It's an immediate option for any organization using Azure cloud services, and it's well integrated with the Azure platform.
- Azure API Management is easy to use and easy to start an API program with. Its administration features are part of the Azure portal. The design concepts behind the offering, which flow through to all services using it, are based on extensive design, usability and accessibility testing.

- As part of the Azure cloud service family, Azure API Management benefits from immediate exposure to a wide user base. It's integrated with a range of Azure services, including Azure App Service, Azure Functions, Azure IoT Hub, Azure Logic Apps, Azure Event Hubs, Azure Application Insights, Azure Monitor, Azure Active Directory and Azure Service Bus. It's fairly well known to API management user communities, despite merely modest investment by Microsoft in its international marketing and sales.

Cautions

- Azure API Management includes 43 commonly used operational policies and a developer portal, but lacks capabilities for later API life cycle stages — for example, many advanced deploy and run features and API retirement/deprecation support. As the offering became generally available as long ago as 2014, Gartner has concerns about Microsoft's commitment of resources to it in a rapidly evolving API management market.

- Azure API Management supports virtual network connectivity for access to on-premises resources, but lacks a customer-managed deployment option that could be hosted on-premises or outside Azure. Microsoft recently announced that such an option would be generally available in mid-2020.

- Azure API Management is an Azure cloud service and will remain focused on developers' and IT professionals' priorities to build, deploy and manage applications through Microsoft's global cloud. It's unlikely to evolve in response to the main business drivers of digital transformations, in contrast to most other offerings in this market.

MuleSoft

MuleSoft combined its integration capabilities with API management capabilities in 2013, when it launched Anypoint Platform. On 2 May 2018, Salesforce completed the acquisition of MuleSoft, with an initial focus on positioning the joint value of integrating and unlocking data. Recently, however, MuleSoft has sharpened its focus as a provider of an API platform that enables organizations to create an agility layer of reusable digital assets and services in order to adapt and become agile. MuleSoft and Salesforce focus their joint go-to-market efforts on accelerating customers' digital transformations.

Anypoint Platform helps customers design APIs consistently. They can use API fragments,

implement APIs and transform data graphically. They can automatically generate unit and integrated tests for APIs and integrations. And they can deploy, manage and analyze APIs and integrations in a unified management center. Anypoint Platform can run on-premises, in the cloud and in hybrid configurations.

MuleSoft sells its platform both directly and through an ecosystem of partners. It has customers worldwide.

Strengths

- MuleSoft continues to show thorough market understanding, effective marketing and thought leadership in the API management market, as well as in related integration markets. Its strategy for growth has earned it customers across the world in several industries and a corresponding notable increase in revenue (60% in 2018, according to Gartner's estimate).
- MuleSoft provides a combination of API management features and technologies to enable hybrid integration. Its offering is therefore attractive to customers who are looking for a full set of hybrid integration platform (HIP) capabilities in a single product.
- MuleSoft's users benefit from comprehensive customer care practices. These include Catalyst, a packaged set of end-to-end offerings that combines customer success, training and other services; a global API strategy team; ProgrammableWeb, an information source that features the API University; and the Ambassadors Program, which encourages developer growth.

Cautions

- MuleSoft's offering combines application integration (both on-premises and in the cloud) with API management capabilities, and might, therefore, be more than is needed by companies that already have an integration platform (especially given the cost). However, that makes it an attractive solution for companies requiring both sets of capabilities. For those seeking just API management, MuleSoft offers a stand-alone offering.
- Customers often wrongly assume that MuleSoft's offerings are fully open source, whereas, although some of its API-related components are, the API gateway and developer portal aren't. This might lead to procurement delays. The market offers an ample choice of fully featured open-source offerings, which have been emerging for some time and are fully viable.
- Users looking for microgateways, support for service mesh and microservices tools generally

report that MuleSoft's Anypoint Platform lacks innovation, and that it is too Java-centric for their needs. MuleSoft plans a multicloud service mesh solution to enhance support for microservices architectures later in 2019.

Oracle

Oracle's API management offering is the Oracle API Platform Cloud Service. It's available either as a cloud solution running on the public Oracle Cloud, or in a hybrid architecture using cloud management of on-premises gateways or gateways running on other cloud services. The gateway component is based on the Oracle Communications Services Gatekeeper product.

In 2017, Oracle acquired Apiary, which provides the Apiary API Design Portal. This is part of Oracle's API platform and available as SaaS. The Apiary API Design Portal enables teams to collaborate on API design, create mock services and perform API quality testing. A cloud API gateway (including analytics and identity services) and a cloud-based or on-premises API developer portal complete the Oracle API Platform Cloud Service offering.

Oracle's API management offering is available worldwide.

Strengths

- Oracle's long track record in application integration, including with Oracle Integration Cloud, complements its API management offering. Oracle therefore represents an attractive option for organizations needing to perform API management in the context of integration.
- Oracle's pricing is attractive to clients. It is based on hourly API traffic and independent of the number of API gateways deployed. This suits organizations with distributed architectures and variable API traffic.
- Oracle focuses strongly on API security, including integration with Oracle Identity Cloud Service for OAuth 2.0.

Cautions

- Oracle's API management solution is tethered to the Oracle Cloud, which makes it unsuitable for organizations that don't want any cloud dependencies. The Apiary API Design Portal is cloud-only, and the management service runs on Oracle Cloud Infrastructure (or Oracle Cloud Machine

for hybrid cloud architectures).

- Oracle's API management offering is still evolving. It lacks advanced deploy and run capabilities, and customization of the developer portal requires API calls or editing of the source code of the API portal itself. A visual content management system is not provided. Oracle's product strategy centers on API design — its support for later stages of the API life cycle (such as retirement) needs functional enhancement.
- Some notable management changes occurred recently in Oracle's API management group. These might affect Oracle's execution in the short term, but are unlikely to reduce the offering's overall viability.

Red Hat

Red Hat is an open-source software company best known for the Red Hat Enterprise Linux (RHEL) distribution, from which over 70% of its revenue derives. Red Hat also has a middleware portfolio, including the 3scale API Management product that it acquired in 2016 and positions among its Agile Integration solutions. Red Hat also offers products for Kubernetes-based container management (OpenShift) and identity management.

Red Hat 3scale API Management was recently made fully open source. It's typically deployed in a hybrid architecture, with on-premises API gateways and management in the cloud. The entire Red Hat 3scale API Management solution can also be run on-premises on Red Hat's OpenShift container management platform.

Red Hat 3scale API Management is marketed worldwide and has customers worldwide.

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Strengths

- Red Hat has a strong presence in the application infrastructure market. It has now integrated a powerful API management platform with several application infrastructure offerings, including

Red Hat Fuse (an integration platform), AMQ (a messaging platform), OpenShift (a container offering) and Red Hat Single Sign-On.

- Deployment in OpenShift and 3scale's federated gateway architecture provides an inherently multicloud solution, as well as the opportunity to blend on-premises and cloud API management in a hybrid configuration. Red Hat's surveyed reference customers identified this architectural flexibility as a key strength.
- Red Hat has a strong worldwide focus on developers. Its API design, development and testing options are functional and effective.

Cautions

- IBM has an overlapping API management offering in the form of IBM API Connect, and the product roadmap for Red Hat 3scale API Management is likely to be reworked. This is a standard caution for an acquired vendor with an overlapping product.
- Following Red Hat's acquisition of 3scale in 2016, API management customers reported that the 3scale product went through a period of slow innovation, which has only recently ended. During that time, other vendors with fully open-source solutions (some based on NGINX, some not) have entered the market as alternatives to Red Hat.
- Red Hat 3scale API Management offers limited support for managing and actively reducing the number of active versions of an API, and for API retirement in general.

SAP

SAP has a long history in the application infrastructure market, in which it sells middleware and integration tools and platforms. Its API management offering is SAP Cloud Platform API Management. SAP delivers this as part of the SAP Cloud Platform, a broad PaaS that also includes integration, portal, mobile app development and data management capabilities. The offering is available on AWS, Microsoft Azure and Google Cloud Platform. SAP uses an OEM version of the Google (Apigee) Edge API gateway as the runtime component within its cloud-only offering. SAP has built its own full life cycle API management capabilities around this gateway, including analytics and an out-of-the-box developer portal.

Products in SAP's wider product line (such as S/4HANA, C/4HANA, SuccessFactors, Concur and

Ariba), as well as partners in its ecosystem, publish their APIs through the SAP API Business Hub. These can then be managed through SAP Cloud Platform API Management, along with other APIs. For API monetization, there is an API-based integration with SAP Hybris (which can provide billing for API usage) and SAP Hybris Revenue Cloud (for revenue management). For analytics, this includes integration through OData APIs with SAP HANA (for data aggregation) and SAP Analytics Cloud (such as for customer journey analysis).

SAP markets its API management offering worldwide, as part of the SAP Cloud Platform, and diversifies it through its digital strategy across a number of industries.

Strengths

- SAP has a sound understanding of the role that APIs play in its customers' digital transformations, and frequently releases new APIs for its applications. API technologies are a key enabler of its "Intelligent Enterprise" vision. Its API management offering is strategic to its entire product line.
- Many integrations are provided with wider SAP platforms, analytics, billing services, identity services and SAP Cloud Platform Integration (an iPaaS). A broad set of APIs for on-premises and SaaS-based SAP products is available.
- SAP provides a set of policy templates for download from the SAP API Business Hub (a central catalog of APIs from SAP and its partners). This points customers to best practices and helps them start using the solution quickly.

Cautions

- Surveyed reference customers for SAP continued to express dissatisfaction with its pricing and contract flexibility, and identified operational challenges associated with integrations with the wider SAP product range. Together with a low level of market responsiveness (according to reference customers), a lack of innovation and limited market share (as estimated by Gartner), this dissatisfaction has impaired SAP's execution in this market.
- SAP no longer sells licenses for on-premises gateways, which should concern organizations looking to operate gateways in highly secured data centers or private cloud environments, or that are bound by regulatory constraints. However, SAP continues to support existing on-premises deployments. Hybrid deployment is on SAP's roadmap, being planned for the first half

of 2020.

- SAP offers API management technology as part of a larger digital transformation platform, the SAP Cloud Platform. Although SAP Cloud Platform API Management can be used on a stand-alone basis, customers benefit most by using it in combination with other SAP offerings.

SEEBURGER

SEEBURGER has a long history in application integration, MFT, and B2B software and services. It makes its debut in this Magic Quadrant as a reflection of its sales momentum over the past year.

The company's full life cycle API management offering is part of the SEEBURGER Business Integration Suite (BIS). This is a business integration platform that takes a blended approach to integration on-premises, in hybrid setups or in the cloud; it supports B2B (EDI), MFT, e-invoicing, IoT, API and enterprise application integration (EAI) use cases and relevant HIP capabilities. It also offers industry accelerators (such as for open banking). BIS has been built from scratch over the years, and is engineered by SEEBURGER in its headquarters in Germany.

SEEBURGER's API management offering became generally available as a means of addressing B2B integration scenarios for the large number of BIS users. It's complemented by an iPaaS offering.

SEEBURGER has approximately 10,000 customers. It operates worldwide from 11 locations in North America, Europe and Asia.

Strengths

- SEEBURGER, which was founded in 1986, traditionally maintains healthy margins. It has a strong financial standing and a very stable business model.
- SEEBURGER has always operated on a worldwide basis, with differentiated strategies for several regions of the world. More than half its API management revenue comes from outside its home country of Germany, and pursuit of international growth forms the basis of its strategy.
- Surveyed reference customers for SEEBURGER expressed a high level of satisfaction with BIS's API management, and praised the company's service and support.

Cautions

- SEEBURGER's primary interest is in B2B integration, and its API management offering has been designed accordingly. As such, this offering addresses only integration-specific API program requirements.
- As a newcomer to this market, SEEBURGER's track record in, and innovation capabilities for, API management are limited, and its product strategy strictly reflects the demands of its integration-focused user base.
- SEEBURGER's strict focus on integration, and its modest investment in marketing specific to API management, restrict its understanding of this market and its vision.

Sensedia

Sensedia was founded in 2007 as a spin-off from CI&T, with a focus on service-oriented architecture (SOA) projects. The Sensedia API Platform was first released in 2013, and is sold primarily to organizations in Brazil and, increasingly, Europe. Professional services teams guide clients through a series of "playbooks" that show how to use the product. There are playbooks on API design, testing and security, among other topics.

The Sensedia API Platform is available on-premises and in the cloud (AWS or Google Cloud). In addition, Sensedia has services-only customers, to which it provides strategy consulting and services relating to API strategy, design, testing and security, including developer outreach services.

Sensedia also offers services for running hackathons, and it stages its own API conference, APIX (API Experience), in Brazil.

Strengths

- Sensedia's playbook methodologies are useful for customers who need assistance with API strategy and the implementation of API management as a whole.
- Sensedia is one of the few vendors in this market to support the growing demand for the creation and management of GraphQL endpoints.
- Sensedia offers a simple pricing model based on recurring fees only, regardless of whether

deployment is in the cloud, on-premises or hybrid. The company's API gateway, developer portal and microgateway (a lighter version of its API gateway) are all sold together, to keep pricing simple and predictable.

Cautions

- Although Sensedia has been hiring local staff and has begun to expand into Europe, it still has limited reach beyond its home country of Brazil.
- Sensedia offers a relatively standard set of features. More sophisticated use cases might require further customization in JavaScript and Java by the customer, by Sensedia's professional services team or by its customer success team (customization by the customer success team is included in the subscription).
- Surveyed reference customers for Sensedia identified the default seven-day detailed-payload log retention as a drawback. Additionally, API traffic data is stored for 90 days for analytics and dashboard purposes, but, although Sensedia permits redirection of log data to a client's preferred data store, the 90-day limit can only be raised by choosing a higher pricing plan. This is not the standard approach across other vendors' API management platforms.

SmartBear

SmartBear focuses on the planning and design, implementation, documentation, testing, and versioning and retirement steps of the API life cycle. In 2015, SmartBear acquired the Swagger project for API definition from Reverb Technologies (formerly Wordnik). It subsequently donated Swagger to the Linux Foundation as the OpenAPI Specification. SmartBear is the company behind the popular SoapUI testing tool and it recently acquired Cucumber, which means it now offers a comprehensive suite of tools for contract-first API design.

SwaggerHub is the SmartBear platform for API design and documentation. It also validates APIs against style guides to ensure APIs are designed consistently across an organization. ReadyAPI is SmartBear's suite of API testing tools. It includes SoapUI Pro for functional and security testing of REST, SOAP, GraphQL, microservices and other back-end services; LoadUI Pro for API load testing and performance testing; and ServiceV Pro for API and database virtualization. SmartBear's AlertSite product monitors applications, APIs and websites.

SmartBear products are available on-premises and as SaaS (running on AWS), in both cases via a subscription model; they are available worldwide.

Strengths

- SmartBear has a well-rounded set of capabilities for designing, developing, testing and monitoring APIs. It's a vendor particularly suitable for organizations who wish to manage a wide portfolio of APIs across their organization.
- Since many enterprises already have API gateways, SmartBear neither provides one nor requires customers to add another API gateway to their architecture. This can be a strength if you already have a gateway, but also a drawback (see Cautions below).
- Owing to its open-source model and the success of SoapUI for many years, SmartBear has a very large number of developers among its users.

Cautions

- SmartBear's strategy is to integrate with third-party API gateways provided by API management vendors through open industry standards such as OpenAPI. However, SmartBear does not provide a runtime solution of its own. In addition, many API management vendors provide their own API design and testing features, which compete with those of SmartBear.
- SmartBear is good at the technical aspects of API design, but doesn't focus on the business aspects of API planning. Consequently, it lacks the business features necessary to help organizations with a high-level API strategy related to digital transformation or new digital value chains.
- SmartBear doesn't support gateway-specific features such as API analytics and API monetization, owing to its lack of runtime management for APIs.

Software AG

Software AG offers its webMethods API Management Platform on-premises and in the cloud (the cloud offering used to be called webMethods API Cloud). In April 2019, Software AG branded its multifunction iPaaS as webMethods.io, and renamed the cloud API management components as webMethods.io API. The API Management Platform offering includes a gateway, a portal, a catalog and a microgateway.

In February 2019, Software AG introduced a new corporate slogan, “Freedom as a Service.” This reflects the company’s observation that customers are using APIs and integration capabilities to develop and deliver innovative and transformational digital products and services. Software AG believes that APIs provide the mechanism to “free your data,” and highlights the importance of delivering data, and supporting services, if organizations are to stand out in today’s “disruption economy.”

Software AG has an established presence in Europe and North America, with headquarters in Germany and the U.S., and a relatively strong presence in other markets, such as Australia and Japan (though much less so in Asia). Its API management offering is sold worldwide.

Strengths

- Customers who use Software AG’s API management solution in conjunction with its broader product set can take advantage of a well-integrated application infrastructure portfolio that includes, for example, application integration, iPaaS, streaming analytics, IoT and in-memory computing applications.
- Software AG has a thorough understanding of the market in terms of API management users’ priorities. Digital transformations are the starting point for its proposition, and Software AG links them effectively to specific technologies, such as microgateways and event-driven APIs, and to the IoT (aided, in the last case, by the acquisition of Cumulocity in 2017).
- A new CEO has injected fresh energy into Software AG’s salespeople and marketing execution, and has a deeper focus on API management.

Cautions

- The maintenance of dual brands (Software AG and webMethods), the recent renaming of products and a lack of corporate marketing in the past may confuse prospective customers. A new chief marketing officer and a wide rebranding effort are addressing this issue, however.
- Retirement of APIs, whether because they are old and little-used or because they have no business impact (or an adverse one), is becoming increasingly frequent and is never a simple task. Software AG’s support for this complicated process is limited.
- With regard to its API management offering, Software AG has good practices for managing and funneling enhancements to its product engineering groups, but it lacks a structured process for

fostering and advancing innovative ideas.

TIBCO Software

TIBCO Software is a well-established vendor of middleware, integration, visual/stream analytics and application infrastructure. It was founded in 1997 and is based in Palo Alto, California, U.S. At the end of 2014, TIBCO was acquired by Vista Equity Partners, and in August 2015, TIBCO acquired the Mashery unit from Intel. In April 2019, TIBCO appointed a new CEO to lead the company into “a new phase of accelerated growth.”

TIBCO’s API management offering is TIBCO Cloud Mashery, which is available as a cloud service, but is also deployable fully on-premises and in a hybrid manner. It extends into Project Flogo, an open-source project that forms the basis of TIBCO Cloud Mashery’s microgateway.

TIBCO goes to market with targeted “connected intelligence” messaging. It markets and sells its offerings worldwide.

Strengths

- TIBCO has been building a global presence for more than 20 years, and now has sales offices in over 30 countries. It has a sales presence in all major regions of the world and a large partner ecosystem of over 900 system integrators and value-added resellers.
- Reliable R&D and support groups have always been behind Mashery offerings, so the current TIBCO Mashery product line offers broad and easy-to-use API management functionality throughout the API life cycle.
- The core API management features of TIBCO Cloud Mashery, and its general product functionality, remain very strong. They benefit from investment in the areas of cloud-native architecture and microservices support.

Cautions

- Most global businesses are getting their digital strategies up and running, and from its inception Mashery had a focus on the business side of APIs. TIBCO, however, has historically focused on technological excellence. TIBCO’s combined marketing messages of business transformation and technological excellence may not appeal to business audiences.

- Although open banking remains a strong driver of API programs, TIBCO Cloud Mashery provides no prebuilt APIs, policies or sandbox environments for open-banking APIs.
- TIBCO Mashery's IO Docs specification for API documentation was innovative in its day, but has been superseded by the OpenAPI Specification (OAS). TIBCO Cloud Mashery now supports OAS, but still makes IO Docs support available in the product and in the documentation.

Torry Harris

Torry Harris provides focused technical solutions, predominantly for use in API-driven digital transformation strategies and delivery efforts, as well as digital ecosystems and marketplace enablement solutions. It provides these solutions to enterprise clients in various industries through a combination of offshore and on-site delivery.

Torry Harris' API management offering, DigitMarket, is a framework of products, processes and services built on open-source components. Its SaaS version runs on AWS. DigitMarket includes an API gateway (with a developer portal), a marketplace product, system integration and IT-related services, and industry templates. Torry Harris has a well-defined program of digital strategy workshops addressing CxO roles, to help customers design an effective API strategy.

Torry Harris was founded in the U.S., and has offshore development centers and R&D offices in India. It markets its products mainly in Europe, the Middle East and Africa, India and Latin America.

Strengths

- Torry Harris is successful at selling to large organizations, mainly those in the telecom, financial services and energy sectors. It addresses these sectors with individualized starter packs across the technology and business areas it covers.
- Torry Harris acts as a partner to its customers in digital transformation projects, and has improved its vision substantially. In particular, it performs effective customer journey mapping, which helps to expand the number of business models it supports.
- Despite its strong focus on consulting, Torry Harris has made good progress with its product offering. This provides most of the advanced deploy and run capabilities, including very fine-grained control of API monetization, traffic management policies, and help for API product

managers assessing the value of their APIs.

Cautions

- Torry Harris differs from the other vendors in this Magic Quadrant in that it generates revenue primarily as a consulting company and uses a variety of open-source products in its projects. Most of the other vendors are direct providers of their own technology and/or managed services in the cloud. This means Torry Harris' consulting engagements will largely dictate the roadmap for, and the development of, products used in its API management solution.
- Torry Harris is not very visible in this market. Its offerings are barely marketed, and it has a relatively small customer base for API management. However, its offering is powerful, so this lack of visibility should not stop potential users from considering it.
- Torry Harris' free trial offering is limited in its SaaS version but unlimited in the on-premises version of the product. In its SaaS version, it offers little scope for potential customers to explore the platform's capabilities before making a strategic commitment to it.

Tyk

Tyk started out, in 2014, as an open-source project founded with the aim of developing an API gateway to handle high-load, high-performance, autoscaling and containerized microservices patterns. As a company, Tyk launched commercially in April 2016, with no external funding. It pursues a transparent business model in which monetization of large enterprise customers pays for continuous improvement of its open-source gateway.

Tyk offers an API management platform with an API gateway, API analytics, a developer portal and an API management dashboard. It is available in various deployment options: SaaS, hybrid, on-premises and multi-data-center. Tyk does not provide a separate microgateway product, as its standard gateway can be configured both for traditional north-south API traffic and in a mesh configuration for east-west service traffic. Its offering was built from the ground up (not using NGINX or Node.js), the only dependencies being on MongoDB and Redis (both of which are open source and free to use at scale).

Tyk has offices in London, U.K., Singapore and Atlanta, Georgia, U.S. It has clients throughout the world, with an even spread of coverage across the U.S., EMEA and Asia/Pacific.

Strengths

- Tyk's pricing model is very attractive to potential buyers. As well as a free open-source version that comes without the dashboard and portal, Tyk offers a "non-commercial" license under which a complete installation, limited to one gateway deployment, is provided for free; any extra installations required have to be paid for. Support is available 24/7 at very affordable prices.
- Tyk has been profitable since launch, and a recent round of venture capital funding has fueled its international expansion. Tyk has active installations in some of the world's largest banks, telecom companies and consumer goods firms.
- Tyk has a simple open-source API management offering that is extensible through plug-ins. It represents an attractive proposition for users with basic requirements who want an initial platform that they can enrich as they progress in order to build modern REST-based applications.

Cautions

- Tyk is one of the few independent API management platform companies still in business. It has few dependencies, and it has grown well since its inception — all of which, however, makes it an attractive target for acquisition by a larger vendor.
- Tyk has traditionally been used mainly by single teams and has achieved limited penetration within organizations, although its traction with enterprises is increasing. It provides more than basic full life cycle API management functionality, especially for the deploy and run phase, but still overlooks users' advanced priorities — such as API monetization and support for API product managers — beyond an API program's first year.
- Tyk approaches this market from a strictly technological angle. Users looking to execute digital strategies will find Tyk useful for enabling their platforms, but will need much more to get an ecosystem started and to execute a digital transformation. They will also need professional services, for example.

WSO2

WSO2 has long provided an open-source integration solution that includes identity management and security, API management and analytics. WSO2 appointed a new CEO in September 2017 to bring a strong business focus to the company. In March 2019, further management changes were

announced. The CEO left the company, which is now led by its long-term COO, who was promoted to president and COO. Additionally, the chairman of Toba Capital, WSO2's majority shareholder, joined the board as executive chairman.

WSO2's API management offering is available in two versions: on-premises (WSO2 API Manager) and public cloud (WSO2 API Cloud). They are identical, except that the latter is hosted and managed by WSO2. The offering is an open-source solution that supports API publishing, life cycle management, application development, access control, rate limiting and analytics in one integrated system. WSO2 also offers what it calls an Integration Agile architecture and methodology to deliver integration projects faster and respond better to business needs.

WSO2's API management product is available for free download. In a recent development, fees for subscription services are now based on a core allotment, on which production runtimes are deployed, to cover any combination of WSO2's API management, integration, identity and Stream Processor products. Hosting in WSO2's public cloud is facilitated by the same per-core model as is used for the on-premises version, at no extra cost; this facilitates hybrid deployments.

WSO2's products are available worldwide.

Strengths

- WSO2's open-source model offers a competitive advantage. It appeals to technically savvy customers who value the ability to customize the solution, are looking for competitive pricing on-premises or in the cloud, and are used to open-source ways.
- WSO2's business model is sound and internationally focused, and the company is cash-flow positive. More than half (53%) of its business is done outside North America, across 63 countries, and its channel partners' revenue doubled in 2018.
- WSO2 is particularly suitable for organizations building an API marketplace as it provides an API marketplace solution that uses WSO2 API Manager and has been employed by a variety of clients to create public marketplaces.

Cautions

- Although it began as a technology-focused company, WSO2 has recently been providing more and more help to customers in terms of API strategy planning and preparation for the business

outcomes of APIs. However, it still mainly targets technology roles, and its customers generally create their own digital strategies, with WSO2 performing the role of technology provider.

- WSO2 has limited marketing reach in the API market, so awareness of it is limited. Its technology-focused approach frequently results in potential buyers overlooking it as a possible strategic partner.
- As WSO2's product enhancements come mostly from its clients and its own developers, the company mainly reacts to emerging industry trends — it's not an innovative, driving force in this market. This approach, combined with a highly technological product roadmap and a long-planned 3.0 release, has weakened its position for Completeness of Vision, compared with the prior Magic Quadrant.

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 consequence of an acquisition, or a reflection of a change in the market (and, therefore, changed inclusion or evaluation criteria), or of a change of focus by that vendor.

Added

- **Broadcom,** which acquired CA Technologies in November 2018.
- **SEEBURGER,** which, thanks to a new API management offering and continued sales momentum in the past year, met the minimum revenue requirement for inclusion in this Magic Quadrant.

Dropped

- **CA Technologies,** which in November 2018 was acquired by Broadcom, a newcomer to this Magic Quadrant.
- **Cloud Elements,** which now focuses on enterprise iPaaS.

- **digitalML,** which now focuses on abstracted service catalog and governed API design.
- **Kony,** which now focuses on the low-code application platform and multiexperience development platform markets, and digital banking.

Inclusion and Exclusion Criteria

For a vendor to be included in this Magic Quadrant it had to satisfy all of the following criteria. It had to:

- Market any subset of the full life cycle API management capabilities defined in the Product or Service part of the Evaluation Criteria section below, both in the cloud and on-premises, or in the cloud only. An offering might be part of a more comprehensive platform, such as a PaaS, a HIP or a platform to support digital business. Vendors offering only on-premises solutions did not qualify for this Magic Quadrant.
- Have been marketing an offering that was generally available or in beta testing as of July 2018. The cut-off date for products to be evaluated as generally available was March 2019. Products scheduled to be available after March 2019 were evaluated as part of their vendors' roadmaps.
- Have a comprehensive, general-purpose offering — that is, not specific to one industry or limited to an adjacent market (such as iPaaS) — for full life cycle API management that covered at least two of the API life cycle stages (planning, design, implementation, testing, deploy and run, and versioning and retirement). This offering had to be available either directly from the vendor or via publicly announced agreements with partners. Vendors not offering a developer portal — either directly or via a publicly announced partner agreement — were excluded from this Magic Quadrant. As noted below, a developer portal is a company's "digital face."
- Generate revenue of at least $15 million (or the equivalent in another currency) per year from full life cycle API management. Vendors pursuing an open-source or open-core business model had to generate revenue of at least $4 million (or the equivalent in another currency) per year from full life cycle API management. These figures include revenue from software, cloud-managed services, support and professional/consulting services relating to the full life cycle API management offering. The figure for open source was lower to reflect the different business model (based on cloud subscriptions and/or support fees, instead of licenses and/or cloud fees).

- Have grown in terms of full life cycle API management revenue or total number of full life cycle API management customers by at least 20% in 2018.

Honorable Mentions

For this Magic Quadrant, Gartner surveyed more than 65 vendors, of all sizes, both open source and closed source. Many of these vendors did not, however, meet the inclusion criteria, frequently having only a fraction of the market share of some of the extremely large competitors. Vendors with a regional focus, a vertical specialization or cloud-only platforms are often less well known than their larger rivals, which have broader functionality, business models and packaging; they were frequently excluded because they generated too little revenue.

The following vendors did not meet the inclusion criteria, but each has notable market presence nonetheless:

- Akana (now part of Perforce)
- Bizmatica Econocom
- Fiorano
- Nevatech
- OpenLegacy
- Postman

Evaluation Criteria

Ability to Execute

Please refer to the general Evaluation Criteria Definitions at the end of this document. In addition, immediately below are details of some aspects specific to full life cycle API management.

Product or Service

We consider providers' capabilities in five different categories, which correspond to one or more

stages in an API's life cycle:

- Planning and initial design
- Implementation and testing
- Deploy and run (basic)
- Deploy and run (advanced)
- Versioning and retirement

Planning and Initial Design

This subcriterion assesses providers' ability to help clients plan and design the right APIs for their business purposes, frequently to enable the execution of digital strategies.

It's now clear that the "if you build it, they will come" approach to APIs won't work (see "Top 10 Things CIOs Need to Know About APIs and the API Economy"). APIs should be designed to meet the needs of actual API consumers, to enable key interactions and to be used immediately. However, anticipating the needs of new interactions, and meeting them as quickly as possible, is highly challenging.

Frequently, full life cycle API management providers offer workshops and tools for business managers, innovation managers, groups tasked with the execution of a digital transformation, application managers and the like. These workshops help determine how to start a technology platform for digital business, identify which APIs to publish or to base a hackathon on, and how to devise APIs that will be essential for building an ecosystem of developers (inside or outside the organization, or both).

Surveys have shown that one of the main factors influencing the selection of a particular API management platform is the thought leadership of its vendor. For this reason, some providers employ recognized industry experts and "evangelists" who very publicly display their knowledge in this area by facilitating webinars, holding conference sessions, helping plan hackathons and holding client workshops on API planning. These professionals also play a fundamental role in clarifying the tasks involved in building a digital platform and starting a digital transformation (see "From APIs to Ecosystems: API Economy Best Practices for Building a Digital Platform").

Other factors involved in designing APIs are external, such as standards and government regulations (for example, banks are being driven to publish APIs in order to satisfy PSD2 in the EU). There are few standards for APIs across industries, but API management providers with industry expertise can help organizations plan and design APIs for such requirements, even if no "standard" layer of APIs has been agreed on across a region or industry.

If APIs are to be used externally, a fundamental part of API planning is upfront assessment of the business model for them (see "Choosing the Right API Monetization and Pricing Model" and "A Strategic Marketing Mindset Is Essential to Externally Facing API Initiatives"). Is the intention to attract new customers, to build a platform on which to foster an innovative ecosystem of developers, to add value to relationships with existing customers (perhaps to stave off competition) or to facilitate partnerships? API management vendors with API strategy and digital business experts can benefit customers by establishing a clear business model for APIs, one that prevents confusion later.

Implementation and Testing

APIs don't appear from nowhere. They are often designed to meet the requirements of one or more specific interactions with a user or a device, and should account for different consumers and personas. Once it becomes clear which data and functionality an API should give access to, that API needs to be fully implemented as soon as possible (to go beyond the initial stubs that some toolkits and API management platforms offer). This process generally involves a mixture of the following approaches:

- Using design tools to create API definitions — in an "API first" approach — which can later be mapped to other systems. (For Gartner's customer-centric API design approach, see "A Guidance Framework for Designing a Great API.")
- Designing the interface first, using an interface specification format and tools to create an API stub that enables testing and development. This is followed by development of the underlying service, which may use some or all of the approaches in the following bullet points.
- Using high-productivity and widely available tools to build simple services, exposed via API, that perform create, read, update, delete (CRUD) operations over an existing system (such as a database or ERP system).
- Implementing APIs in front of microservices (see "Innovation Insight for Microservices" and

"Decision Point for API and Service Implementation Architecture").

- Reworking existing internal APIs or service interfaces exposed by an iPaaS, integration SaaS (iSaaS) or other (possibly hybrid) integration platform, or by a preexisting enterprise service bus.
- Using IoT API toolkits, which enable direct API creation in order to access data and manage IoT devices.
- Composing existing lower-granularity SOA services or microservices, and frequently adding business logic on top.
- Embedding or combining external APIs (public or partner APIs, including cloud or SaaS APIs).
- Programming new implementation code from scratch.

Providers often package into their full life cycle API management offerings the functionality to ease identity management or speed up the implementation of APIs serving mobile apps. This may extend to portions of what are sometimes called mobile back-end services, which are evaluated as part of this subcriterion.

When implementing an API, an API provider typically wants to enforce specific design policies. There is a wide variety of design policies and, in general, the bigger the API provider, the more design policies apply. Here are some examples of design policies:

- Enforcement of technology standards or protocols that a specific API must comply with before being published.
- Definition of a specific application area that a specific development group can implement APIs on (or from).
- Adherence to specific API templates, or to patterns or models provided as input from the previous design phase. An example is a "style guide," defined by an API product manager, for APIs to adhere to within an organization (see "Create the Role of API Product Manager as Part of Treating APIs as Products").

API industry standards are generally very immature at present. However, several API providers

need to comply with or observe:

- The European Second Payment Services Directive (PSD2) for open banking, and the authentication framework it mandates in the EU.
- The Fast Healthcare Interoperability Resources (FHIR) recommendations for the healthcare sector.
- The privacy rules set out in the General Data Protection Regulation (GDPR) to protect personal data in the EU.

We consider the availability of toolkits, accelerators or specific extensions to ease the implementation of APIs according to these "standards" to be of high importance.

Once an API has been implemented, it must be tested for suitability for its expected — and frequently unexpected — uses (see "Promote Continuous Quality for APIs to Support Digital Business"). It's fairly common for successful public APIs (success often being measured by the range, number and diversity of consumers) to be used for purposes they were never designed for. Very often, wide usage of APIs should be encouraged, because it enables the creation of new value, but APIs should be tested thoroughly if they are to operate properly in different usage scenarios. Indeed, with the widespread growth of digital transformations, effective API testing is of paramount importance, both at design time and at runtime. That is why this subcriterion also assesses generic functionality for API testing.

Additionally, this subcriterion evaluates the ease and speed with which an API is implemented and tested. It does so by examining how easily and effectively the API testing works in conjunction with API design functionality (whether offered directly by the vendor or via partners), and the operation of the API at runtime.

Deploy and Run (Basic)

This subcriterion assesses providers' capabilities in the area of basic API management, which mainly concerns the packaging, operation, runtime and maintenance of APIs.

Basic API management is divided into three functional areas:

- Policies relating to operational management, security, format translation and the collection of metrics associated with the usage of APIs. A policy defines, implements, monitors, enforces and manages desired behaviors and exceptions relating to the usage of a specific API. Examples relate to caching, throttling, load balancing, capacity planning, integrity, confidentiality, authentication and authorization (with OAuth, for example), threat prevention and protection, data transformation (depending on the consumer), data and functionality visibility, quality of service, and compliance with SLAs.
- An API gateway that enforces the above policies.
- Discovery, developer access provisioning, testing and collaboration (in the developer portal). Developer portals also include general reference documentation (such as code samples, sandboxes, client libraries, software development kits, test kits, references to hackathons and API/app contests). Ease of use and the ability to support self-service — for the developers who will create apps that consume the APIs — are of fundamental importance.

Deploy and Run (Advanced)

This subcriterion assesses capabilities that go well beyond basic API management. Some of the following can be packaged as options for mature API management offerings:

- Support for API providers, through API management products or services related to the building of ecosystems, including active promotion of API usage, solutions built with APIs and collaboration, sometimes via an API marketplace (see "Align Your API Marketplace Strategy With Your Ecosystem Goals and Revenue Expectations"). Frequently, this support is achieved by setting up hackathons and running API/app contests that target, through social platforms or other means, the developer communities that might be interested in an API and provide innovative ideas (see "Using Ongoing Hackathons to Accelerate Digital Transformation: A Practical Handbook"). A social platform may also be provided for developers to collaborate on APIs, and to share ideas about the usage of APIs. We also assess how easily a digital marketplace can be built.
- Delivery of metrics to assess the business value of a specific API. Users of Gartner's client inquiry service who are interested in APIs often ask "How do I know if an API is of value?" Generally, the value is in the eyes of the API consumer and in the business benefits that the API enables, directly or indirectly, for the API provider. Also, we rate specific features aimed at easing and enhancing the work of the API product manager, such as the ability to define API

products, and analytics features that compare API products and link them to each API's business value.

- Support for a variety of API monetization options, well beyond simple usage statistics for APIs (see "Choose the Right API Monetization and Pricing Model"). The benefits and value of APIs can be measured in many ways, because APIs generally have several types of value associated with them, which, furthermore, can change rapidly over time. The granularity and bands of usage plans may also change over time, based on API consumers' behavior.
- Availability of, and effective integration with, a microgateway, and/or a service mesh (open-source or not) (see "How a Service Mesh Fits Into Your API Mediation Strategy"), together with management and distributed governance of distributed services and microservices.
- Support for asynchronous and event-driven APIs, according to OpenAPI 3.0 callbacks or other means, and, in general, functionality to manage the loading and analysis of event streams (generated by IoT devices, for example).
- Support for non-REST protocols, such as GraphQL and gRPC.
- Reverse gateway functionality. Applications (or even single APIs) frequently call out to other web APIs that are offered by different companies. Alternatively, an organization may make use of third-party APIs — a reverse gateway would enable API providers to monitor usage of and dependencies on third-party APIs (see "Managing the Consumption of Third-Party APIs").
- Advanced security features — offered directly or through partners — aimed at preventing malicious attacks on an API platform and protecting against activities such as competitive data mining, logic attacks and sustained bot activity.
- Customization, flexibility, extensibility and ease of use of the developer portal. The developer portal is a company's "digital face."
- Availability of a potentially limited offering that prospective customers could use for free for a limited period to clarify their API management platform needs.
- Support for PSD2, FHIR and GDPR-specific policies.
- Provision (directly or through partners) of AI APIs, and usage of AI techniques within the platform, such as predictive analytics on API usage patterns, bot detection (good and bad bots) or assisting developers browsing through APIs (for example, with a chatbot).

Versioning and Retirement

Mature API programs already have to deal with several versions of the same API. This issue is becoming more important as companies realize how impractical it is to keep many versions of the same API in production at the same time. Specific usage policies (such as simple data transformations) aimed at specific types of API consumers can greatly reduce the need for different versions of the same API.

Applications, apps, devices, chatbots and personal assistants that use APIs change frequently, and with digital business will come and go very dynamically. As APIs are typically consumed in several different scenarios, some will evolve to such an extent that a new version is demanded, some will no longer be used, and a few will require no change at all.

The creation of new versions of APIs while supporting old ones should always be thought through, as it will become increasingly hard to sustain. Avoiding versioning in the first place would prevent many downstream problems (see "A Guidance Framework for Creating Usable REST API Specifications"). If API providers allow versioning to get out of control, the only choice is to retire old versions of APIs by moving API consumers off them and onto new versions. That is easier said than done. In many scenarios, it will prove very difficult and will require a variety of "hard" and "soft" approaches. As support for API providers and consumers is crucial in this regard, this subcriterion assesses how wide and effective that support is.

Additionally, companies increasingly realize that APIs they have published in the past no longer meet their business goals or have unintended, adverse effects, and therefore retire them. This is becoming more and more common, especially for B2C APIs. If a soon-to-be-retired API doesn't have many consumers, the decision to retire it will have manageable consequences downstream. Sometimes, however, an API is retired because it doesn't produce value for the API provider — but does for the consuming applications and its users, who may be many. This situation is difficult to manage. Technology can help by, for example:

- Determining from the developer portal which and how many developers have actually created an app that consumes the API
- Using API analytics, and providing insights into patterns and volumes of usage of the API
- Informing developers when an API is scheduled to be retired or deprecated, and what alternative APIs might be offered (frequently with a new pricing plan)

But managing these cases is largely a complex organizational endeavor, involving many negotiations that only humans can carry out, especially when no alternative API is offered. A modern API management platform can, however, support and facilitate API retirement in many ways, and companies increasingly need this type of functionality.

Overall Viability

Once API programs mature, depending on how standard the policies on the gateway are, API providers might incur relatively high costs to switch full life cycle API management vendor. Also, the degree of change that occurs in API consumers' requirements (and the potential impact of those changes) can be noticeable. For these reasons, we consider a vendor's relative size (in terms of customers and revenue), the impact of past, present (and potentially future) acquisitions, financial stability and the continuity of management in this market.

Because of the breadth of full life cycle API management functionality, some vendors partner with other providers to complete their offerings. Some others partner to multiply their sales opportunities. Such partnerships and their perceived effectiveness are of interest when evaluating a vendor's viability. We also consider the size and quality of a vendor's active user community, relative to its target market, and the availability of professional and consulting services.

Sales Execution and Pricing

We track revenue growth, including the number of clients a vendor has, the number and business impact of the projects it has implemented, and whether (and how) professional and consulting services have eased implementations. We also evaluate whether pricing models — on-premises and in the cloud — are expressed with clarity and predictability, and track their changes over time. A vendor's ability to handle large and complex deals comes into play here, too.

Market Responsiveness/Record

The dynamic nature of API programs, the furious pace of change that the execution of digital transformations increasingly demands, and the speed with which a vendor can respond, adapt and take advantage of the changes are key factors. We also look for evidence that a provider responds well to rapidly evolving conditions in this market by, for example, integrating AI into its security policies and developer portals, or serving as a platform for digital business.

Marketing Execution

We assess the degree to which a vendor has captured mind share, demonstrated thought leadership and gained a solid reputation in this evolving and growing market. Of particular significance is how strong a vendor's differentiation is, and the breadth of its thought-leading content. We also evaluate how effective a vendor's go-to-market strategy has been, and how often it appears on shortlists for full life cycle API management projects. The effectiveness of marketing and partnership programs is evaluated, too.

Customer Experience

We track the specificity and quality of support (domestic and international), contracts and SLAs for the availability of full life cycle API management functionality. API management issues are roughly the same worldwide, and across industries, but the types of policy that organizations choose to address first vary considerably by culture, geography and project, even within the same company. We assess service and support, and the ability to understand organizations' needs. Specific attention is given to the customer experience outside the vendor's home market.

Operations

This is another area in which the availability of professional and consulting services for the effective deployment of full life cycle API management, and the provision of related tactical or strategic advice, are crucial. We consider a vendor's track record in meeting SLAs and its security and privacy certifications. We assess the scope (in terms of people and data centers, for example) and reliability of its hosted service platforms (for cloud offerings). We also evaluate the scalability and adaptability of its software platforms (for on-premises deployment), including metrics for efficiency, speed of change, implementation of new features and scale.

Note: The weightings in Table 1 are unchanged from the previous Magic Quadrant.

Table 1: Ability to Execute Evaluation Criteria

Evaluation Criteria ↓	Weighting ↓
Product or Service	High
Overall Viability	High

Sales Execution/Pricing	Medium
Market Responsiveness/Record	Medium
Marketing Execution	High
Customer Experience	High
Operations	Medium

Source: Gartner (October 2019)

Completeness of Vision

Please refer to the general Evaluation Criteria Definitions at the end of this document. Additionally, immediately below we describe details of some aspects specific to full life cycle API management.

Market Understanding

End users need to run API programs effectively, increasingly as part of digital transformations. They need to build platforms and develop ecosystems on top of them. And they need to manage the API security issues that will arise. Accordingly, we evaluate the degree to which they show understanding of these needs and anticipate or create new ones. We also assess the likely future effectiveness of a vendor's partnerships with other technology and service providers (for example, API security and bot protection providers). Additionally, we evaluate how well a vendor understands on-premises and cloud (private and public) requirements for small, midsize and large projects in various industries, and in different geographies, and its support for nascent standards (where available). In short, we assess how well a vendor understands the full life cycle API management market, and how powerfully its vision will drive this market forward.

Marketing Strategy

We examine a vendor's plans to articulate its value propositions (for example, enabling their clients to create a digital platform), and how its offering (together with any partners' offerings) will create new business value for clients (for example, in a digital transformation). In this evolving market, a vendor must understand and monitor its competitors, differentiate itself, and exploit an

effective marketing channel to reach its target audience; segmentation of the target market and clear identification of buying centers are fundamental.

Sales Strategy

We look for evidence that a vendor uses the right balance of direct and indirect sales vehicles. We also assess whether it targets the right mix of small, midsize and large organizations for its target markets, geographies and industries. Even more than for Marketing Strategy, we look for clear identification of a target market (innovation centers, chief digital officers and their groups, or companies in a specific industry with time-critical transformation efforts) and specific roles in that market. We also look for evidence of a sound business plan and an effective strategy that uses presales, evangelists, activities that demonstrate thought leadership, and professional and consulting services (with related templates, accelerators, blueprints and best practices), where appropriate.

Offering (Product) Strategy

We ask specifically about a vendor's offering plans and roadmaps, and we assess how complete and effective the full life cycle API management offering is likely to be in years to come. We also examine the offering's overall architecture, whether based on technology or managed services, to assess how future-proof it is and how easily it can be integrated with users' current infrastructure. When a vendor uses third-party functionality from partners to extend its offering (for example, to cover other API life cycle stages), we assess a number of things: How effective and seamless is the extension for the user? How solid and helpful are support practices likely to be? How viable is the partner? Would inclusion of this functionality in the vendor's direct offering make more sense in terms of its vision?

Business Model

We examine how a vendor targets or maintains profitability through its sales strategy and pricing models, and how those models work in the cloud, on-premises and for partner sales. In some cases, especially for smaller vendors, profitability might not be an immediate objective, so we evaluate on a case-by-case basis how things are likely to work out for a vendor and its customers. Because of the breadth of full life cycle API management functionality, some vendors must partner to complete their offerings. These partnerships, their effectiveness and their viability, from a user perspective, are central to evaluating a vendor's business model. We assess the breadth of a vendor's professional and consulting services, how a vendor recognizes revenue and capitalizes

on investments in R&D, and its growth strategy (including mergers and acquisitions) across geographies.

Vertical/Industry Strategy

We look at the industries a vendor focuses on, the industry-specific solutions it offers (if any), and how successful or differentiating these solutions are (or are likely to be). The rules by which an API program is run are frequently industry-specific, even if core API policy requirements change little across industries. We assess industry-specific blueprints, standards support and starter kits, if there are any.

Innovation

In the full life cycle API management market, innovation is not a desirable option. It is a necessity for survival. Innovation targets the three cornerstones of the API economy: API providers, developers and users of the application constructs that consume APIs (see "The API Economy: Turning Your Business Into a Platform (or Your Platform Into a Business)"). We look at structured approaches to discover, value and drive innovation ideas, and assess how effectively and systematically innovative ideas are filtered and funneled through product development. We also look at a vendor's track record of anticipating or leading new trends in the market.

Geographic Strategy

API programs are now running in many parts of the world. We look for evidence that a vendor is engaging with the most promising locations for its capabilities, and whether further opportunities might exist in areas not explicitly addressed at present. We assess a vendor's nondomestic project fulfillment capacity, support centers, sales offices, partner networks, and ability to support complex international requirements and features (such as region-specific compliance with local laws and regulations).

Note: The weightings in Table 2 are unchanged from the previous Magic Quadrant.

Table 2: Completeness of Vision Evaluation Criteria

Evaluation Criteria ↓	Weighting ↓
Market Understanding	High

Marketing Strategy	High
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	Medium
Vertical/Industry Strategy	Low
Innovation	High
Geographic Strategy	High

Source: Gartner (October 2019)

Quadrant Descriptions

A Magic Quadrant reflects Gartner's judgments about vendors' Ability to Execute and Completeness of Vision in a market — in this case, the full life cycle API management market. The Ability to Execute criteria reflect the staying power and record of execution of vendors in this market. The Completeness of Vision criteria reflect vendors' abilities to understand the market's trends, to lead and influence them, and to follow them with agility and consistency.

In 2018, vendors' collective Completeness of Vision worsened significantly, effectively shifting the 2019 Magic Quadrant to the right. This is a definite sign of a maturing market, but it also reflects the following major changes since the previous Magic Quadrant was published:

- Three of the Leaders in the last Magic Quadrant (CA Technologies, MuleSoft and Red Hat [3scale]) have been acquired. Red Hat has been acquired by another Leader (IBM).
- The remaining Leaders in the last Magic Quadrant (Google [Apigee], Software AG and TIBCO Software), one Challenger (Axway), one Visionary (WSO2) and one Niche Player (Oracle) have either changed their CEO or their head of API management products.

These tectonic shifts are still affecting a very dynamic and healthily growing market (see the Market Overview section below). The massive sales opportunities that digital transformations will continue to offer will keep prompting adjustments to the vision of most vendors in this Magic Quadrant, which will make them attractive acquisition targets. Many of the offerings from vendors in the Magic Quadrant have been acquired, in some cases twice, but acquisitions are unlikely to stop in the medium term.

Also, with this market having grown to $1.3 billion in 2018, this year's Magic Quadrant reflects a general improvement in vendors' Ability to Execute, with sizable growth from some vendors in the upper half of the quadrant (again, see the Market Overview section below). Consequently, the Magic Quadrant has effectively shifted up significantly, in the process appearing to lower the positions of many vendors on the Ability to Execute axis.

A word of caution. A vendor assessment process naturally tends to favor comprehensive offerings and powerful sales and marketing strategies. A tightly focused product, even if exceptional, typically won't score as well as a comprehensive offering supported by strong sales and marketing strategies. This, in turn, frequently favors the larger vendors, because their extra resources enable them to allocate substantial sales and marketing investments to support their API management products, and to offer more comprehensive collections of functionality.

Our conversations with clients indicate that they often focus only on the Leaders when starting a vendor selection process. That is not the best approach. The variety of use cases for APIs (see "Critical Capabilities for Full Life Cycle API Management") means that the best vendor for a particular type of company, industry, project or geography is often found within the Magic Quadrant, but not among the Leaders. This is especially the case outside the U.S. Clients often wrongly fear that non-Leaders just aren't good enough. But the breadth of functionality in API management platforms means that it takes considerable investment and a sharp focus on this market just to appear in this Magic Quadrant (even among the Honorable Mentions). We therefore recommend that clients start their selection process by considering a subset of the vendors in this Magic Quadrant, one that includes non-Leaders. Furthermore, it's potentially worthwhile to consider vendors not mentioned in this Magic Quadrant, if they could prove particularly effective locally, or if they specialize in a particular type of API, or if they are already well established in your company. You can then narrow the field further as the evaluation becomes more focused on specific requirements.

Leaders

Leaders are vendors that execute strongly and that lead and influence the market. Recent entrants to this market that have a limited record of execution are less likely to be Leaders. The same applies to strongly executing vendors that are overly risk-averse or that don't effectively exploit innovation trends.

The most distinctive attribute of Leaders is that they can address the widest variety of API use cases: mobile and multiexperience, integration using APIs, data as a service, B2B and open banking (for further details, see "Critical Capabilities for Full Life Cycle API Management").

The pulverization of the API economy into a growing number of sweeping digital transformations and the rise of the platform/ecosystem business model have put API programs on the agendas of CIOs and, in some cases, CEOs. API programs frequently start small with innovative ideas, and might involve a few hackathons before they take off, but then they need to execute very quickly. Leaders have made sure their offerings can help clients thrive in this dynamic environment.

In this Magic Quadrant, there are fewer Leaders than in the previous one. The tectonic shifts mentioned above have reduced their number from seven to five. Collectively, their vision is good, but not exceptional: None is really driving this market forward with innovative ideas. Also, in Figure 1, the Leaders are roughly stacked on top of each other, which indicates bigger differences in their Ability to Execute than in their Completeness of Vision.

There are two main ways of becoming a Leader in this market:

- By acquiring another Leader or Visionary, integrating it into a wider application infrastructure offering and keeping up with the pace of API management innovation.
- By addressing digital transformations and their integration challenges head-on, with thought leadership and product functionality, and offering fully functional API management solutions.

Leaders understand the market trends that will benefit them and their clients' business strategies, frequently in the form of digital transformations. Leaders see the business potential of API programs, communicate this potential to business units, and help their clients realize it.

There are no fully open-source Leaders in this market. But this situation is likely to be temporary,

as several open-source providers are close to the Leaders quadrant.

Challengers

Challengers generally execute well for the types of work for which they offer functionality, but they have a blurred or incomplete view of the market's direction, sometimes due to a lack of innovation, marketing and sales focus on API management.

Traditionally, this Magic Quadrant has had few Challengers, on the basis that, in this market, if a vendor's vision is below average, its execution is likely to be so, too. Also, if a vendor doesn't show thought leadership, most users are unlikely to buy from it. This year, there are only two Challengers, and their Ability to Execute is not far above the median line.

The future of these providers is directly dependent on how aggressive and proactive they are in addressing their current shortcomings. As they must innovate to fulfill requirements for digital transformation, and market them effectively, it's likely that they will become Leaders. Otherwise, they may become Niche Players or Visionaries, or drop out of the Magic Quadrant altogether. Of course, they may also remain Challengers, but this market's strong dynamics and fast evolution over the past 18 months indicate that even maintaining their current position will require them to evolve.

Visionaries

Visionaries approach this market with a fresh view from an innovative angle. Although they are typically smaller, or offer an incomplete set of functionalities, they have the power and mind share to grow their capabilities, often in a different way from established Leaders.

As stated above, no Leader is really driving this market forward with innovative ideas, due to the tectonic shifts. A few vendors have taken advantage of this situation, and improved their Visionary status, or been promoted from the Niche Players quadrant. This year, we have five Visionaries, some of which have vision nearly on a par with Leaders, instead of the four we had in the last Magic Quadrant. Visionaries make generally good acquisition targets for established, larger players that want to buy their way into the Leaders quadrant. As noted above, acquisitions will continue.

Niche Players

Niche Players focus on a segment of the market. The segment is typically defined by a life cycle stage (design, for example) or another characteristic, such as industry, client size (and spending power), geographic area, advanced functionality (in terms of performance or security, for example) or fully open-source nature.

Unsurprisingly, especially given the relatively large number of Niche Players in this Magic Quadrant (eight out of 20 vendors), some of the Niche Players fit this description better than others. Also, some have made significant improvements to their offerings, and some have not.

In their specific niche (typically), these vendors' offerings might be more functional than those of Leaders. In other cases, an improved position on the Magic Quadrant might just be a sign that a Niche Player is maturing, or that it's extending its offering.

Niche Players' Ability to Execute is limited to their focus areas. It's therefore partial and is assessed accordingly. Their ability to innovate and, to a greater extent, survive in this market is limited by their narrow focus, but they often tend to move much faster than vendors in other quadrants. Improving their marketing strategy and fostering innovation is their safest route to graduating from the Niche Players quadrant.

Context

API programs and initiatives don't necessarily need a full set of functionalities from the outset. However, new functional requirements, such as for security and identity management, will emerge rapidly and will need to be addressed quickly. Therefore, we recommend that organizations that run API programs consider offerings with the potential to address their needs well beyond the first project or two. They will find it much easier, quicker and less expensive to acquire an API management platform with more functionality than they currently need than to extend or replace a limited one as new requirements arise.

Replacing an API management platform involves:

1. Rehosting all policies (some of which might not be standard in all platforms)

1. Routing all API calls to a different gateway

2. Republishing APIs in a different developer portal

3. Performing regression tests

This is generally an uncomplicated task during the first few months of usage, but it becomes more complicated as an API program matures and policies become more sophisticated.

An API management platform should not limit its users to one way of consuming APIs, such as via mobile apps. Full life cycle API management solutions have evolved to support, for example:

- IoT scenarios and protocols (including complex connected-car scenarios)
- Personal assistants (such as Apple's Siri and Microsoft's Cortana)
- Wearable devices
- B2B APIs (often used for new B2B interactions, instead of established protocols like EDI)
- APIs consumed by rich web applications

Depending on your company's priorities and digital strategies, the developers who embed the APIs you publish may be inside or outside your IT department, or even outside your company. Therefore, to derive the most value from an API program, you need a developer portal.

Start by meeting the needs of your internal developers. This will reduce the effort required to develop APIs. Also, starting with a good developer portal for internal use will help immensely once you start publishing APIs externally in a B2B or B2C fashion. Some companies publish APIs in a public API catalog (GitHub, for example), and consider that enough — but whatever product you are selling, would you want it available in only one shop or in many? In addition, if you are executing digital transformations, the developers' experience is as important as the users' experience. As previously noted, the developer portal is your company's "digital face."

To stimulate fresh ideas, you need to publish the right APIs and aim to create new business value, which is ultimately what digital business is all about. Several companies run hackathons to uncover innovative opportunities (see "Using Ongoing Hackathons to Accelerate Digital Transformation: A Practical Handbook"). These generally involve APIs from diverse sources in

different industries.

One of the most far-ranging and fascinating rules of API programs, and a general trait of successful APIs, is that once an API has been published, developers will use it for things you never imagined. This is both a blessing, because it will attract innovation, and a curse, because you must protect yourself from malicious usage, which is far from fully predictable at the beginning.

Frequently, clients don't know where to start an API program. In almost all cases, they have started one already, having already amassed tens of APIs. They might not be aware of these APIs — which perhaps arose as byproducts of previous projects — but they have them. Their choice is then whether to govern them or not. We recommend getting involved in digital transformation projects as their requests, which will be fast and furious, will clearly tell you which APIs they need. It's a good idea to focus on the value of the application constructs that might be built on top of the APIs.

Market Overview

A market comprises end users looking for solutions to the same or similar problems, and providers aiming to supply those solutions in the form of products and services. Our view is that companies will need all the functionality described in the Product or Service section (above) for their API programs in the next few years.

Acquisitions continue in this market, as digital transformations will multiply and deepen API programs' execution. Vendors that link digital transformations to API programs effectively will benefit greatly. Further acquisitions of midsize, growing and reasonably established players won't be possible for a while, though, because no acquisition targets matching that description are left. Instead, the market now has larger, more mature and decisively more expensive players (some with considerable technological "baggage"), and much smaller, immature, sharply focused vendors that serve niche requirements. We expect to see a few acquisitions of large players, and a higher number of smaller, more focused acquisitions to plug holes in existing offerings (for example, in API security) and to maintain innovativeness and therefore, ultimately, competitiveness.

This is a healthy, growing market (see "Market Share Analysis: Full Life Cycle API Management, Worldwide, 2018"). Gartner estimates that the market's revenue came to $1.3 billion in 2018,

having grown by 31% from 2017. Although its growth decelerated slightly in 2018 (compared with 33% in 2017), it was still the seventh-fastest-growing infrastructure software market that Gartner tracks.

Gartner estimates this market will reach $1.6 billion within the next 12 to 18 months. This estimate is supported by the strong growth reported by providers in 1Q19 and 2Q19. Gartner expects this market to be the third-largest integration platform segment within the next two to three years. It should attract technology and service providers, due to its consistently high growth rates and the expectation of further growth. Its growth is likely to continue at solid double-digit rates during the next five years, given the rise of pressing API program requirements in the financial services sector (spurred by PSD2 in the EU) and the data privacy regulations that banks must comply with in most countries. These will result in further strong demand for fully on-premises solutions, which might extend double-digit growth further.

A sizable number of full life cycle API management solutions are still bought for installation on-premises, not in the cloud. Most banks outside the U.S. prefer on-premises deployments to comply with payments regulations (which are spreading around the world) or to run an open banking strategy. As most cloud providers are based in the U.S., privacy concerns (real or perceived) still prompt non-U.S. companies to run full life cycle API management solutions on-premises. Recently, some vendors have deprioritized on-premises requirements in favor of better scaling options, more flexible hybrid deployment models, more powerful API analytics and simplification of their product lines. But we believe this is a mistake as on-premises full life cycle API management is not going away — actually its share of total API management revenue is growing (it represented 37% of the whole market in 2018, according to Gartner estimates). Not having an on-premises solution will therefore impair sales execution.

At present, full life cycle API management capability is still generally sold on its own. But even though on-premises solutions remain in demand, API management is increasingly sold as part of more comprehensive cloud service platforms, as the growth of large cloud players like Amazon, Google and Microsoft shows. Increasingly, API management is finding a place in “as a service” variants (such as infrastructure as a service [IaaS] and PaaS), its first coupling with iPaaS being to form an HIP and to meet the needs of complex API designs. This integration trend will increase in the short term as an increasing number of clients needing application integration, in the cloud and on-premises, consider API management solutions first. Also, offerings generically presented as “platforms for digital business,” based on technology and system integration services, are

proliferating, and regularly feature API management. Bear in mind that, as on-premises API management still has a long future ahead, all these combinations go well beyond cloud service platforms. Clients ask us “Where is API management going?” — a question to which all of the above answers apply.

The Market Definition/Description section above provides further details of the trends that are shaking this market.

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.