

# Ovum Decision Matrix: Selecting an API Management Solution, 2016-2017

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Meeting the requirements of internal and external API management, and digital business initiatives

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## Summary

### Catalyst

APIs offer a simple yet flexible and scalable approach to enable enterprises to participate in and exploit the digital economy, and are no longer considered to be "humble" technical interfaces. APIs in their various guises facilitate the externalization of the enterprise, enabling the opening up of new revenue streams and simplifying the integration of digital sales, marketing, commerce, branding, and other channels into established business processes and models. With this background, it is quite clear that APIs are central to the integration infrastructure required to support digital business initiatives.

API management offers a unified approach to the governance of public, private, and partner APIs while fulfilling other key requirements, such as message/protocol transformation, developer enablement and community management, API lifecycle governance, operational and business analytics, API/service/data security, and monetization. It is an increasingly critical capability, providing the requisite governance, performance management, and security framework to help ensure that digital business initiatives involving use of APIs deliver positive business outcomes.

This Ovum Decision Matrix (ODM) is a comprehensive evaluation to help enterprise/solution/integration architects, integration competency center/integration center of excellence directors/managers, API product/business owners, and digital business and line-of-business (LOB) leaders select an API management solution best suited to their specific requirements.

### Ovum view

The ever-increasing need to achieve digital transformation continues to be a key driver of the business and IT agenda, although it is often disguised by flashy buzzwords and unfulfilled strategic objectives. Digitalization is driving major changes in the expectations of end users of technology. This transformation is not confined to business process improvements or achieving more with less.

Instead, it signifies a shift toward digital supply chains that are essential for engaging and retaining customers and partners expecting a better user experience across a range of access channels and on a 24x7 basis. APIs are at the core of the integration layer supporting this transformation.

API providers need to attract, manage, engage, and retain skilled developers for the development of innovative applications and services. API design, lifecycle management, developer and partner community management and engagement, secure access and identity federation, and visibility into API consumption are critical factors for the success of API-led digital transformation initiatives.

Several enterprise API initiatives have failed to deliver business value not because IT did not put the right infrastructure in place, but because of the lack of effective business-IT coordination. This can lead to a half-baked enterprise API strategy that fails to identify key metrics for gauging the success of API initiatives, and by and large does not align with the overall business objectives. It is therefore important that chief information officers (CIOs), chief digital officers (CDOs), and enterprise architects realize that APIs are strategic assets offering a simple and flexible approach to "externalization" of the enterprise. In simple terms, APIs are the glue binding together different components of the digital supply chain.

The ever-evolving API economy presents a good opportunity for API providers to improve their positioning in the digital value chain. Several enterprises have demonstrated how APIs can help create new revenue streams as well as deliver competitive advantage via new sales, marketing, commerce, branding, and other channels embedded into established business models. However, without API management, API providers/business owners will struggle to govern the use, proliferation, and monetization of APIs and the underlying digital assets.

Several vendors have entered the API management market over the last two or three years and quite a few have revamped their API management proposition over the same period. Ovum's conversations with enterprise IT leaders and architects indicate a rapid decline of the old guard of service-oriented architecture (SOA) governance, which is "good enough" for only a few use cases.

Interestingly, API management itself is undergoing a transformation toward becoming a more comprehensive approach delivering API creation and composition capabilities along with end-to-end API management. This is important because an API created without due consideration of expectations and requirements of API consumers will fail to gain any significant traction. We define such a combination of API creation and end-to-end API management capabilities delivered via the cloud as "API platform-as-a-service" (APIPaaS).

A growing number of API management vendors have not resulted in a highly fragmented market. In fact, the top seven vendors in this ODM account for over 65% of the global market size. While this figure might diminish in the future, it is highly unlikely that this market will follow a normal distribution. This will continue to be a rapidly evolving market where no vendor can rest on its laurels and expect to retain competitive positioning without continued effort and investment in execution of an aggressive product and growth strategy.

It is equally critical that API management vendors focus on selling more than a piece of software and that they develop competencies as a "strategic partner" for digital business initiatives. Without doubt, this "add on" to API management solutions represents a growing market opportunity in terms of API technical and strategy consulting services.

We see "x+API" as the new mantra for innovation in an increasingly digital world, where enterprises need to respond to new market opportunities at a pace that cannot be supported by traditional approaches. The component "x" in "x+API" equation can range from a specific data set, service, application, or an API to an integration flow allowing mobile enablement of existing business processes. This translates into the exposing and combining of various software components for the development of new applications and services.

Enterprise adoption trends indicate an unrelenting need for the coupling of both comprehensive and specific integration capabilities with API management to support the requirements of complex use cases. It is clear that API management is a critical component of a middleware stack catering for digital business integration requirements. The "API economy" will be a hot topic in the near term, but we expect enterprise interest to shift toward monetization and development of new API-enabled business and engagement models.

Enterprise APIs will continue to evolve and so will the need to govern API usage and to support complex use cases. We expect to see microservices (micro APIs) providing greater flexibility for composing new APIs that can be combined with other APIs and services to develop new applications. API providers will have the flexibility to tweak components of an API mix to develop another set of

applications/services. With API-led innovation driving the development of new digital services and business models, API management will increase in scope and complexity.

## Key findings

- Specialized API management vendors and a couple of major middleware vendors are among the market leaders.
- There is stiff competition between market leaders, and successful execution of an aggressive product strategy and roadmap, and expansion into new regions and market sub-segments will determine how the vendor positioning changes over the next two-to-three-year period.
- Continued success in this market will not be determined by technological prowess, size of customer base, or aggressive sales and marketing tactics. It is less about selling a good software product and more about developing competences to function as a strategic partner to enterprises embarking on digital business/transformation initiatives involving the use of APIs.
- Ovum expect more partnerships and acquisitions in this space over the next couple of years as specialized API management vendors realize the need to develop an end-to-end proposition in combination with middleware stack vendors.
- API management is gradually evolving into a broader discipline, which we define as API PaaS. Several vendors are working toward offering an API platform delivering comprehensive API creation/composition capabilities along with end-to-end API management.
- There is a strong belief among developers, integration practitioners, and enterprise and solution architects that fine-grained service governance is of limited use in the current operating environment. Enterprises following an SOA governance-led approach for meeting API management requirements of digital business initiatives are likely to fail.
- According to a recent Ovum survey, the number of enterprises with an API program is expected to increase by 150% over the next two to three years. It is often said that an enterprise that does not expose APIs in today's business environment bears a stark resemblance to a company that did not have a website in 1990s.
- Enterprise API initiatives will continue to be largely driven by business motivations, and IT will indirectly position APIs as a strategic business asset. There will be more talk of digital services and digital business, with APIs used as a peripheral argument to secure buy-in and funding for digital initiatives.
- In the near term, we expect interest in microservices architecture to drive the development of lightweight API management platforms comprising "microservice/micro API" gateways and a management layer enabling service discovery, lifecycle management, community management, and operational monitoring and analytics.
- Ovum forecasts rapid growth for global "standalone" API management solutions market, which is expected to grow at a compound annual growth rate (CAGR) of 31.8% between 2015 and 2020.

### Vendor solution selection

## Inclusion criteria

Ovum has closely tracked the API management vendor landscape over the last three to four years and we have used these observations as the baseline for inclusion/exclusion in this ODM. The criteria for inclusion of an API management solution in this ODM are as follows:

- It should be available as a “standalone” API management solution offering a minimum set of features and capabilities across the key pillars of end-to-end API management: API lifecycle management and core capabilities, developer enablement and community management, security, and monitoring and analytics.
- From a broader perspective, the solution’s features and capabilities should not be confined to basic monitoring, lifecycle management, analytics, and security delivered on top of a broader platform or middleware stack.
- There is substantial evidence that vendors are interested in pursuing a progressive product strategy that helps ascertain product viability and applicability to a range of API management use cases.
- The API management solution should have been generally available as of June 30, 2015. The vendor must have at least 30 enterprise (paid) customers using its API management solution as of December 31, 2015.
- It should be able to meet requirements of at least five use cases covered under the “execution” evaluation dimension of this ODM.
- It should deliver enterprise-grade developer enablement, API governance, and security capabilities. Low-cost solutions/alternatives that don’t have significant credentials in these areas were excluded from this evaluation.
- It is not a “cloud-only” solution and there are means to support on-premise deployment of at least some core architectural components of the API management solution.

## Exclusion criteria

An API management solution is not included in this ODM if:

- It is more or less an “SOA governance solution with better tools” and does not resonate with the practical requirements of enterprise API initiatives aimed at meeting specific business objectives.
- There is not enough evidence that the vendor is interested in expanding the solution’s features and capabilities to cater for the requirements of emerging use cases and exploit new market trends.
- It is just an “add-on” module to a broader integration platform, especially an integration PaaS (iPaaS) solution or an enterprise service bus (ESB)/SOA platform.
- There are indications that the vendor is struggling to grow business and has partnered with middleware vendors to retain its position in the market.
- The customer base is confined to only a few specific vertical industries and/or a specific region.
- The vendor has no direct contact with end users (enterprise customers), and customer support and interaction is taken care of by partners.

- There were not enough improvements in terms of product development, geographic expansion, and marketing. This indicates a reactive/defensive/archaic business strategy for this specific product line, which otherwise is not a core business for the vendor.

## Ovum ratings

### Market leader

This category represents a leading API management solution that Ovum believes is worthy of a place on most technology selection shortlists. The vendor has established a commanding market position with its API management solution demonstrating relatively high maturity, good innovation and enterprise fit, and the capability of effectively meeting the requirements of a wider range of use cases, as well as executing an aggressive product roadmap and commercial strategy to drive enterprise adoption and business growth.

### Market challenger

An API management solution in this category has a good market position and offers competitive functionality and a good price/performance proposition, and should be considered as part of the technology selection. The vendor has established a significant customer base, with its API management solution demonstrating substantial maturity and catering for the requirements of a range of use cases, as well as continuing to execute a progressive product and commercial strategy.

### Market follower

An API management solution in this category is typically aimed at specific use cases and/or customer segment(s), and can be explored as part of the technology selection. It can deliver the requisite features and capabilities at reasonable charges for specific use cases/ requirements.

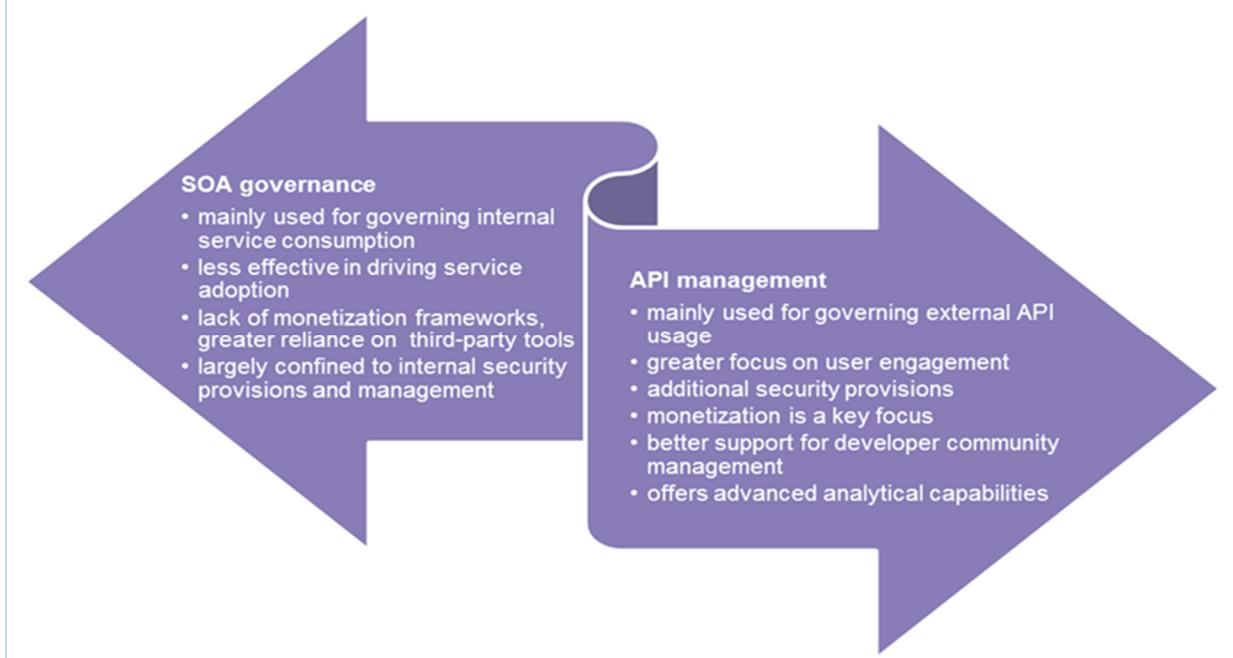
## Market and solution analysis

### Settling the SOA governance versus API management debate: focus on differences and not synergies

There is a significant synergy between SOA governance and API management. Both focus on managing user access and interactions with service components. In addition to following the principles of service orientation, both disciplines advocate the application of best-practice patterns and offer guidance to developers to help promote system manageability. Similar governance paradigms can be used for both disciplines, although API management calls for much more stringent rules and policies because these scenarios typically involve external parties, whether business partners or third-party developers (see Figure 1).

SOA governance involves the management of the relationship between the service consumers and the providers by exploiting a loosely coupled architecture. However, SOA governance is not very effective when it comes to defining usage entitlements and monetization rules and enabling runtime monitoring across different environments. API management fills this gap and focuses on driving user engagement, thereby extending the use of SOA principles both within and outside the enterprise.

**Figure 1: SOA governance versus API management**



Source: Ovum

The premise that API management is "service-oriented architecture (SOA) governance with better tools" does not resonate with the practical requirements of enterprise API initiatives that aim to meet specific business objectives. It is quite common to see developer teams publishing services without much success in driving the sharing, reuse, and adoption of these services across different parts of the enterprise. IT leaders often complain that SOA governance programs do not provide adequate insight into service consumption and the business value realized by developing, reusing, and aggregating SOA services. It is hard to imagine API initiatives delivering any significant business value without insight into how and by whom APIs are being consumed and what needs to be done to drive API adoption.

Community management and engagement is a decisive factor for the sustainability of any API ecosystem. A key feature of API management is the provision of a collaboration venue that enables API providers to expose, document, promote, and support their APIs in a way that increases visibility and eases consumption of APIs across the developer community.

API providers need to simplify the process involved in onboarding new developers to the community. In general, API management solutions offer self-service access to API documentation and software development kits (SDKs) to help simplify API consumption. API management vendors are increasingly focusing on social integration of their solutions to allow single sign-on and login from Facebook, GitHub, Google, and other OAuth 2.0-enabled sites. This is yet another area where API management overcomes the limitations of SOA governance, which tends to be less effective in dealing with external developers and users.

An API that does not attract the attention of developers and fails to deliver significant business value is just another run-of-the-mill SOA service that gets lost in the spaghetti of integration flows that cannot adapt to new requirements. While not all APIs are developed and used for revenue generation,

external parties can only be engaged if there is a potential opportunity of directly or indirectly realizing significant value.

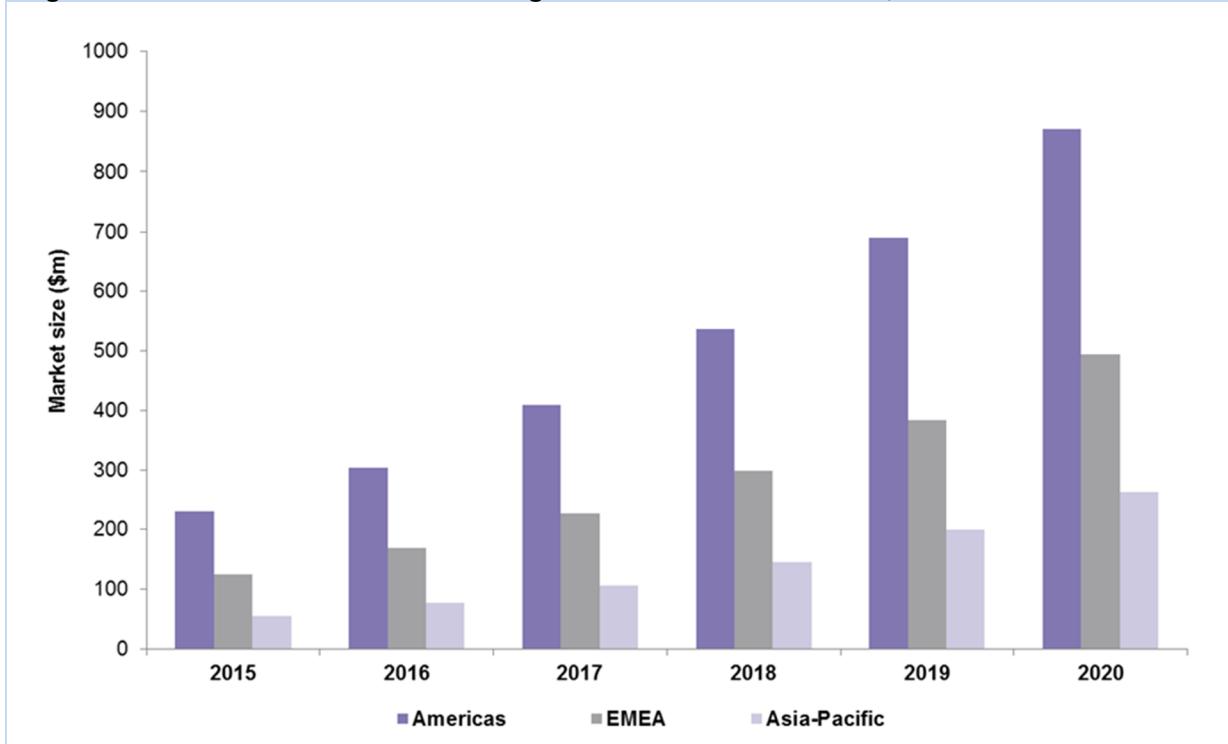
SOA governance proponents often argue that API providers can use third-party monetization platforms or billing solutions to support monetization requirements. Several API management solutions can support a range of monetization models, while ensuring a close fit with operational and business analytics.

## Global API management market size forecast

On the vendor side, there have been several developments indicating strong momentum behind a holistic approach to API management, and in particular, a shift from the traditional SOA governance paradigms for internal API management. There will be a further rationalization of the SOA governance and API management solutions portfolios of major vendors, with a gradual shift toward standalone API management solutions capable of meeting both internal and external API management needs.

Ovum forecasts the global spend on “standalone” API management solutions to grow at a CAGR of 31.8% between 2015 and 2020, crossing the \$1bn mark in the first half of 2019 (see Figure 2). Asia-Pacific (Asia-Pacific) will be the fastest growing regional market, and is estimated to grow at a CAGR of 36.7% over the forecast period. The regional market in Americas is expected to grow from \$304.4m in 2016 to \$871.6m by end of 2020.

Spending on standalone API management solutions in the Europe, Middle-East, and Africa (EMEA) region is expected to grow at a CAGR of 31.6% over the forecast period. This forecast excludes solutions that fall under the category of “SOA governance with better tools”, with significant gaps in capabilities across key API management pillars. We have also excluded solutions that offer only specific capabilities, such as, for example, API monitoring on top of iPaaS, or are a nascent “add-on” to a broader middleware platform.

**Figure 2: Global “standalone” API management market size forecast, 2015-2020**

Source: Ovum

## Key and emerging API management use cases

Ovum analyzed adoption trends based on insights gathered from conversations with enterprise IT decision-makers and users, and API management vendors. Table 1 specifies key, mid-level, and emerging API management use cases, and interestingly, most of the relatively mature solutions are capable of meeting the requirements of key use cases. Emerging API management use cases represent a growing market opportunity.

**Table 1: Identifying key, mid-level, and emerging API management use cases**

Use case	Adoption criticality/priority
iPaaS/cloud integration + API management	Key
Mobile application/access gateway: mobile-enablement/mobile access to back-end applications/services	Key
B2B/partner gateway: B2B integration + APIs	Emerging
Enterprise API initiatives, including API creation, external consumption, developer/partner community management, and API monetization	Key
M2M communications/internet of things	Emerging
Extension of SOA beyond the firewall	Mid-level
Content distribution and ecommerce	Key
API management for software-defined networking (SDN)	Emerging
API management to accelerate mobile application development (internal and external developers)	Key
Microservices orchestration and management	Emerging

Source: Ovum

## Market developments

A closer look at the API management vendor landscape reveals several developments over the last two to three years that are indicative of the increasing importance of API management:

- In the fourth quarter, 2012, Axway acquired Vordel to exploit its API management and SOA governance portfolio and offer an end-to-end security and management suite.
- Intel acquired Mashery in the first half of 2013, and in 2015 sold it to Tibco.
- CA Technologies acquired Layer 7 Technologies in the first half of 2013.
- In 2013, MuleSoft announced the availability of Anypoint API Manager and acquired ProgrammableWeb, the largest API directory and community.
- Dell Boomi announced the availability of API management capabilities with the Summer 13 release of AtomSphere integration PaaS and later in the first half of 2015, launched a dedicated API management offering.
- In the first quarter 2013, IBM announced the availability of an on-premise solution for the creation, socialization, and management of APIs. Later in September 2015, it announced the acquisition of StrongLoop to add Node.js capabilities for rapid creation of APIs with Java and API management delivered via the cloud.
- In the third quarter 2015, Oracle introduced Oracle API Manager Cloud Service as a component of Oracle SOA Cloud Service to enable API creation, publishing, community management, and security via the cloud.

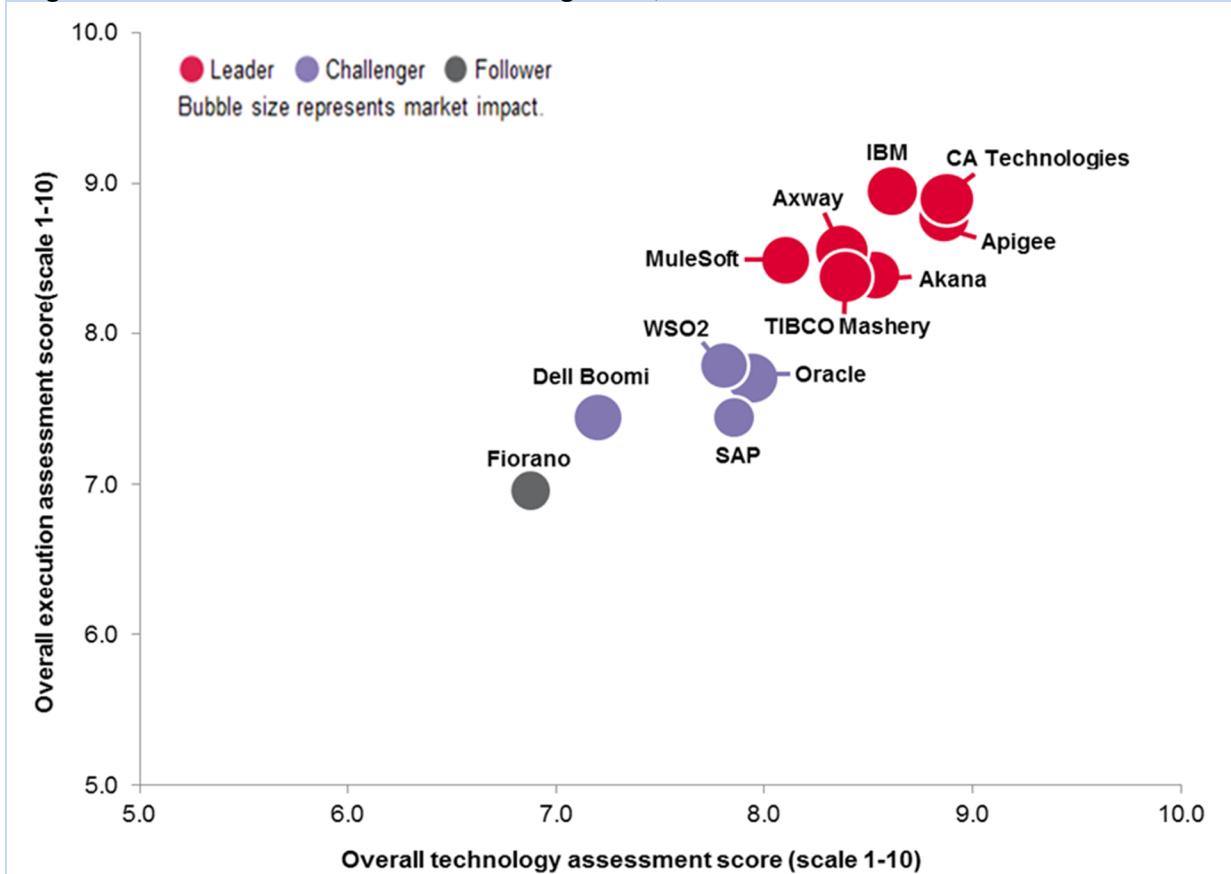
## Ovum Decision Matrix: API management, 2016-2017

The ODM charts in Figures 3 and Figure 4 represent the results of a comprehensive evaluation of 12 API management solutions meeting the inclusion criteria. Figure 3 includes “leaders”, “challengers”, and a “follower”, as per the results and specifications of ODM evaluation and ratings framework (see Methodology section).

As shown in Figure 3, there are a couple of distinct clusters, representing vendors with relatively small differences in overall scores across technology and execution dimensions. Figure 4 provides an expanded view of overall competitive positioning of 12 API management solutions included in this ODM.

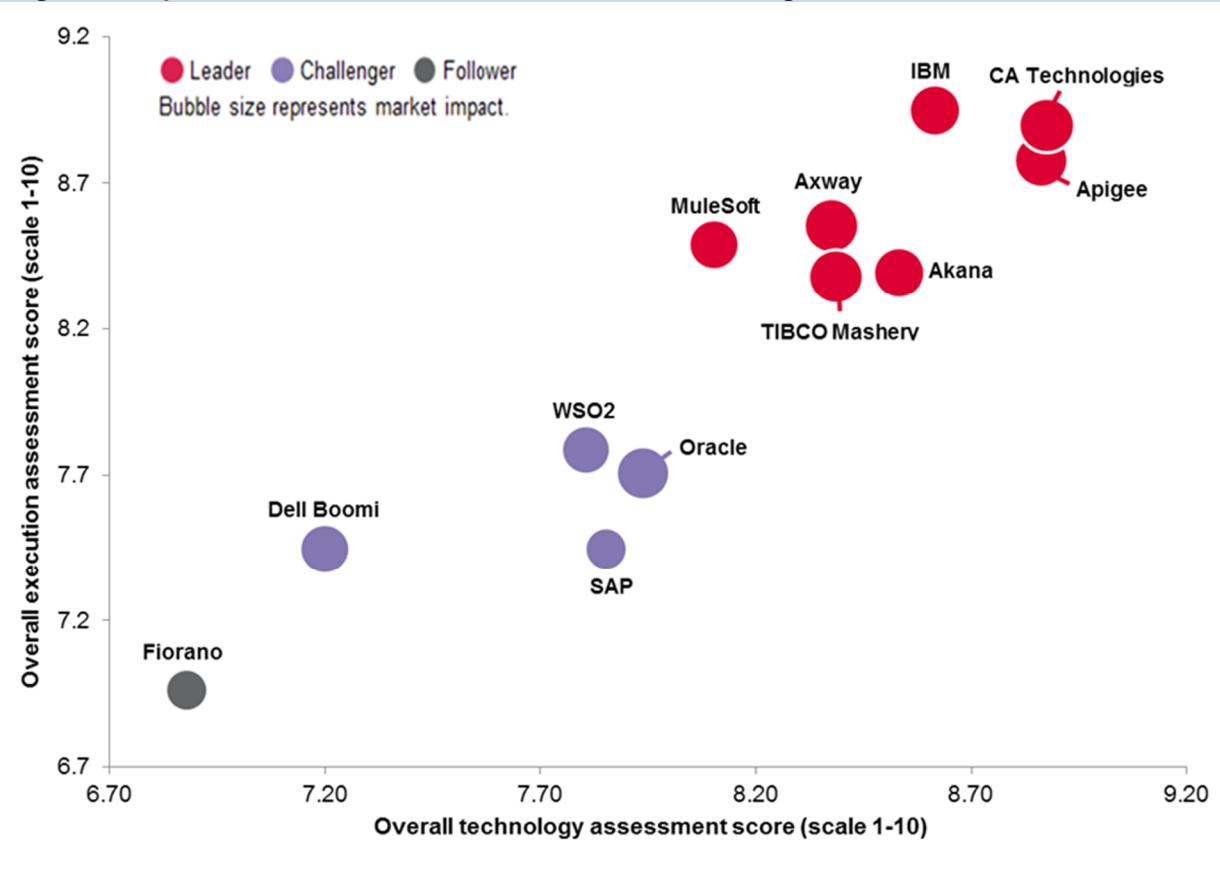
Market impact scores determining the bubble size were calculated based on scores achieved for four criteria groups (customer base and time-in-market, revenue, geographical revenue distribution, and customer diversity/enterprise size split). The geographical revenue distribution and customer diversity/enterprise size split criteria groupswere assigned minimal weighting. Table 1 provides a list of market leaders, challengers, and followers in alphabetical order (not in terms of scores), and subsequent sections also follow this practice.

**Figure 3: Ovum Decision Matrix: API management, 2016-2017**



Source: Ovum

**Figure 4: Expanded view of Ovum Decision Matrix: API management, 2016-2017**



Source: Ovum

**Table 2: Ovum Decision Matrix: API management, 2016-2017**

Market leaders	Market challengers	Market followers
Akana	Dell Boomi	Fiorano
Apigee	Oracle	
Axway	SAP	
CA Technologies	WSO2	
IBM		
MuleSoft		
Tibco Mashery		

Source: Ovum

## Market leaders: Akana, Apigee, Axway, CA Technologies, IBM, MuleSoft, and Tibco Mashery

Akana is a specialized API management vendor headquartered in Los Angeles, California. Its API management solution offers a good balance between developer and business-centric approaches to enterprise API initiatives. Akana has strengthened its competitive positioning by adding/expanding features and capabilities in areas such as DevOps automation and support for microservices-based

application development, API security and identity federation, software-as-a-service (SaaS) integration, API analytics, community management, and API publishing and consumption.

Apigee is headquartered in San Jose, California and is a pioneer in evangelizing and supporting API-led digital transformation. It has expanded features and capabilities of its API management offering in areas such as hybrid cloud architecture and lightweight API management, API design and testing, API security, and private cloud deployment. Apigee's recent financial results indicate impressive business growth and it raised \$78.3m from initial public offering (IPO) of common shares on Nasdaq global select market trading on April 24, 2015.

Axway is a middleware vendor with corporate headquarters in Phoenix, Arizona. It offers integration solutions catering for electronic data interchange (EDI) and managed file transfer (MFT), API management, and cloud integration requirements. Axway's API management solution is an established offering supporting a wide range of use cases. Axway is a front-runner in supporting "B2B + API" use cases and its API management solution offers robust security capabilities. The Appcelerator acquisition is expected to strengthen the mobile integration, performance, lifecycle management, and monetization capabilities of Axway's API management solution.

CA Technologies is an established enterprise software vendor headquartered in New York. CA API Management offers comprehensive features and capabilities across key API management pillars including API lifecycle management and core capabilities, developer enablement and community management, security, and monitoring and analytics. Product announcements made at CA World 2015 in areas such as enterprise API creation and secure exposure, mobile application services, and "API management-as-a-service" further strengthen the competitive positioning of CA API management.

IBM is a major enterprise software (including) middleware vendor headquartered in Armonk, New York. It offers a comprehensive set of end-to-end API management capabilities and strategy consulting services to support digital business/transformation initiatives. IBM continues to execute an aggressive product and marketing strategy and recently announced the availability of IBM API Connect, which in simple terms is an end-to-end API platform allowing users to create, run, manage, and secure APIs and microservices. Ovum envisages the future of API management as a broader API PaaS phenomenon, and IBM API connect aligns with this vision.

MuleSoft is an established middleware vendor headquartered in San Francisco, California. MuleSoft Anypoint Platform is a unified solution for SOA, SaaS, and API-led integrations. MuleSoft's API management proposition is functionally rich in terms of API lifecycle management and core capabilities and monitoring and analytics, and caters for a range of developer enablement and community management requirements. MuleSoft is one of the fastest growing companies in the middleware market, and has secured external financing of more than \$250m since its inception in 2006. The product strategy for API management aligns well with key market trends and emerging use cases, and MuleSoft can effectively function as a strategic partner for digital transformation initiatives.

Tibco is a major middleware vendor headquartered in Palo Alto, California. The Mashery acquisition has enabled extended comprehensive API lifecycle management and greater ease of use for developers to the combined Tibco-Mashery API management offering, which can be used for meeting the requirements of a range of key and emerging API management use cases. Tibco Mashery API management offers robust monitoring and analytics capabilities, and a range of essential features across API lifecycle management and core capabilities, developer enablement and community

management, and security. Tibco is focusing on expanding toward an “API platform” enabling API creation, productization, and distribution. This aligns with Ovum’s vision of the natural evolution of API management discipline toward “APIPaaS”.

## Market challengers: Dell Boomi, Oracle, SAP, and WSO2

Dell Boomi is the only specialized iPaaS vendor included in this ODM. It is based in Berwyn, Pennsylvania. Dell Boomi offers a cohesive combination of cloud-based iPaaS, MDM, and API management solutions. It has registered rapid growth in the adoption of its API management offering since its general availability in 2015. The API management solution offers capabilities across API creation, publishing, and governance, and Dell Boomi is focusing on expanding/adding capabilities in areas such as usage reporting, policy management, better visibility into end-to-end management, and Internet of Things (IoT) integration.

Oracle is a major enterprise software (including middleware) vendor headquartered in Redwood City, California. Oracle offers both on-premise and cloud-based API management solutions and is executing well against an aggressive product strategy focused on developing an “APIPaaS” offering that supports end-to-end API management. We believe this is a move in the right direction because we see “APIPaaS” as the future of API management. Oracle’s API management solution offers robust security capabilities, and in combination with other components of Oracle middleware stack it can cater for a range of use cases, including “cloud integration + API management”, mobile-enablement of back-end applications/services, “B2B integration + APIs”, and IoT integration.

SAP is a major enterprise software vendor headquartered in Walldorf, Germany. It offers both on-premise and cloud-based API management solutions. SAP’s API management proposition is functionally rich in terms of developer enablement and community management, and monitoring and analytics. The enterprise edition offers integrated SAP HANA predictive analytics, with SAP Hybris Billing solution supporting API monetization requirements. SAP’s API management proposition continues to evolve at a good pace, with significant cross-selling opportunities across existing SAP applications, integration infrastructure, and HANA platform customers.

WSO2 is an open source middleware vendor with offices in the US, UK, and Sri Lanka. WSO2’s API management solution offers a range of capabilities across API lifecycle management and core capabilities, and developer enablement and community management, and supports a range of deployment options. A relatively low-cost solution, it offers a predominantly developer-centric approach to API management. WSO2 has achieved significant success in driving business growth, especially via its partner network, which itself has grown at a rapid rate to expand reach across the globe. It is well placed to support microservices orchestration and management use cases, and the integration and API management requirements of IoT initiatives.

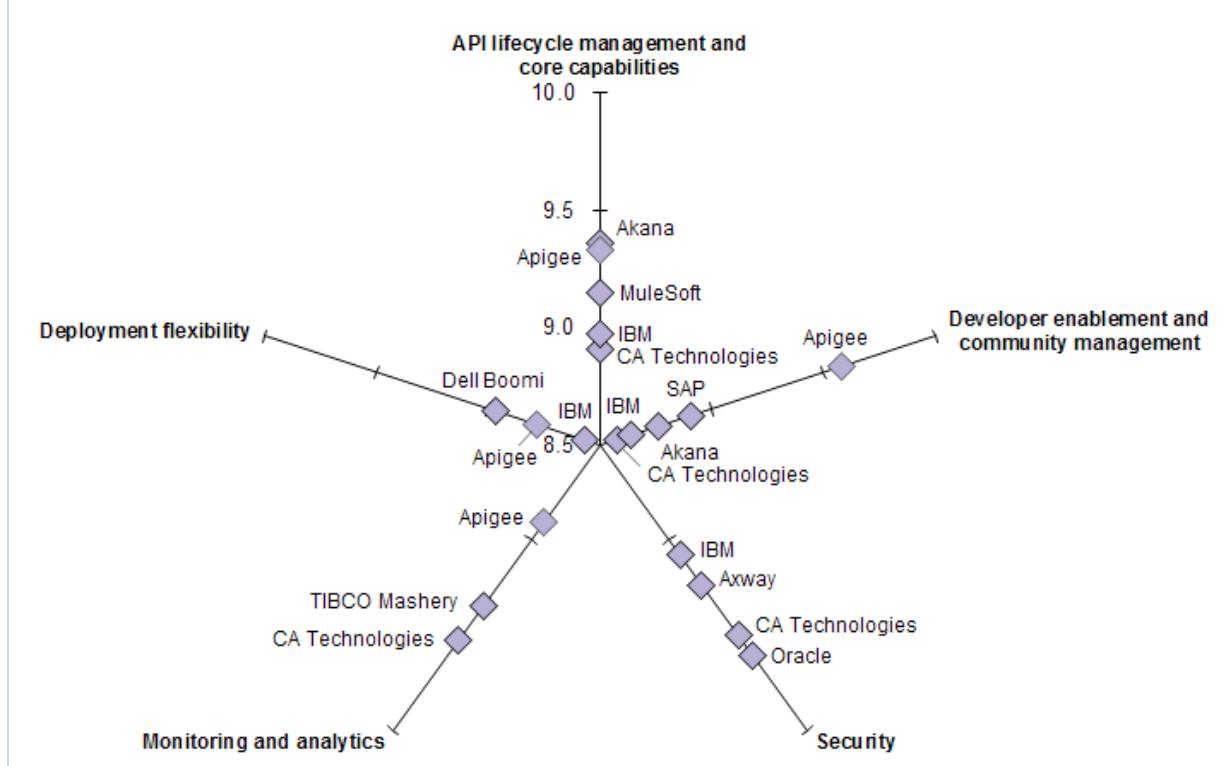
## Market follower: Fiorano

Fiorano, a privately held company based in Palo Alto, California, was founded in 1995. It is a relatively new entrant in the API management market. Fiorano has evolved from being a provider of elementary integration products, such as message bus, to its current position as an enterprise middleware vendor that offers integration platforms for a wide range of integration requirements including application-to-application, B2B, cloud service, and mobile application integration. Fiorano’s API management offering has evolved at a good pace since its general availability in December 2014.

## Market leaders

### Market leaders: technology

**Figure 5: Ovum Decision Matrix: API management, 2016-2017 market leaders – technology**



Source: Ovum

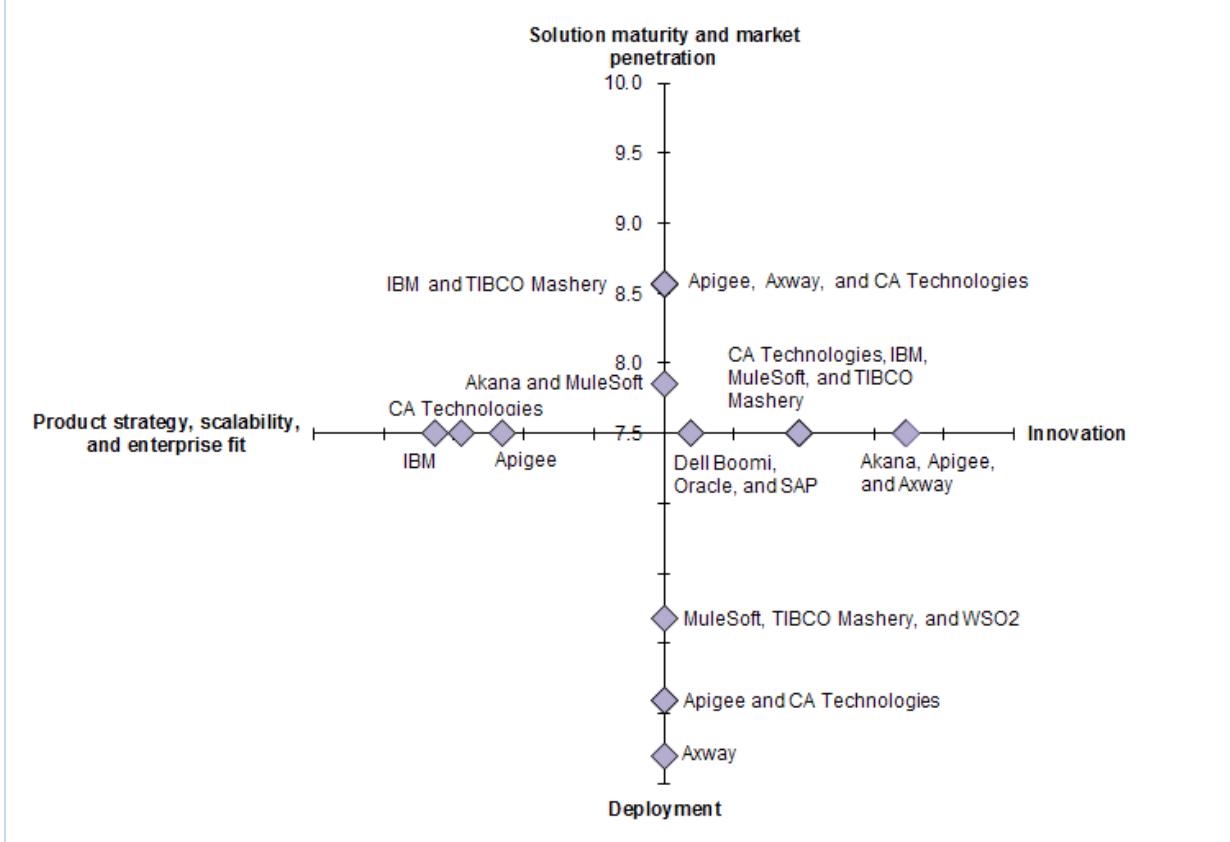
Figure 5 shows vendors with “top five” scores within the range of 8.5-10 (on a scale of 1-10, including those with the same scores) for each category of the ODM technology dimension.

Akana, Apigee, MuleSoft, IBM, and CA Technologies are top five vendors in API lifecycle management and core capabilities, while Apigee, SAP, Akana, IBM, and CA Technologies are corresponding “top five” vendors based on cores against the parameters covered under the “developer enablement and community management” criteria.

In the context of security, Oracle, CA Technologies, Axway, and IBM have top four scores. CA Technologies, Tibco Mashery, and Apigee figure among the top three in terms of monitoring and analytics capabilities. Dell Boomi, Apigee, and IBM offer greater deployment flexibility.

## Market leaders: execution

**Figure 6: Ovum Decision Matrix: API management, 2016-2017 market leaders – execution**



Source: Ovum

Figure 6 shows vendors with top three scores within the range of 7.5-10 (on a scale of 1-10, including those with same scores) for each category of the ODM execution dimension.

“Product strategy, scalability, and enterprise fit” criteria group has significantly higher weightings than the three other criteria groups under execution dimension. In the context of solution maturity and market penetration, Apigee, Axway, CA technologies, IBM, and Tibco Mashery have the highest scores, followed by Akana and MuleSoft.

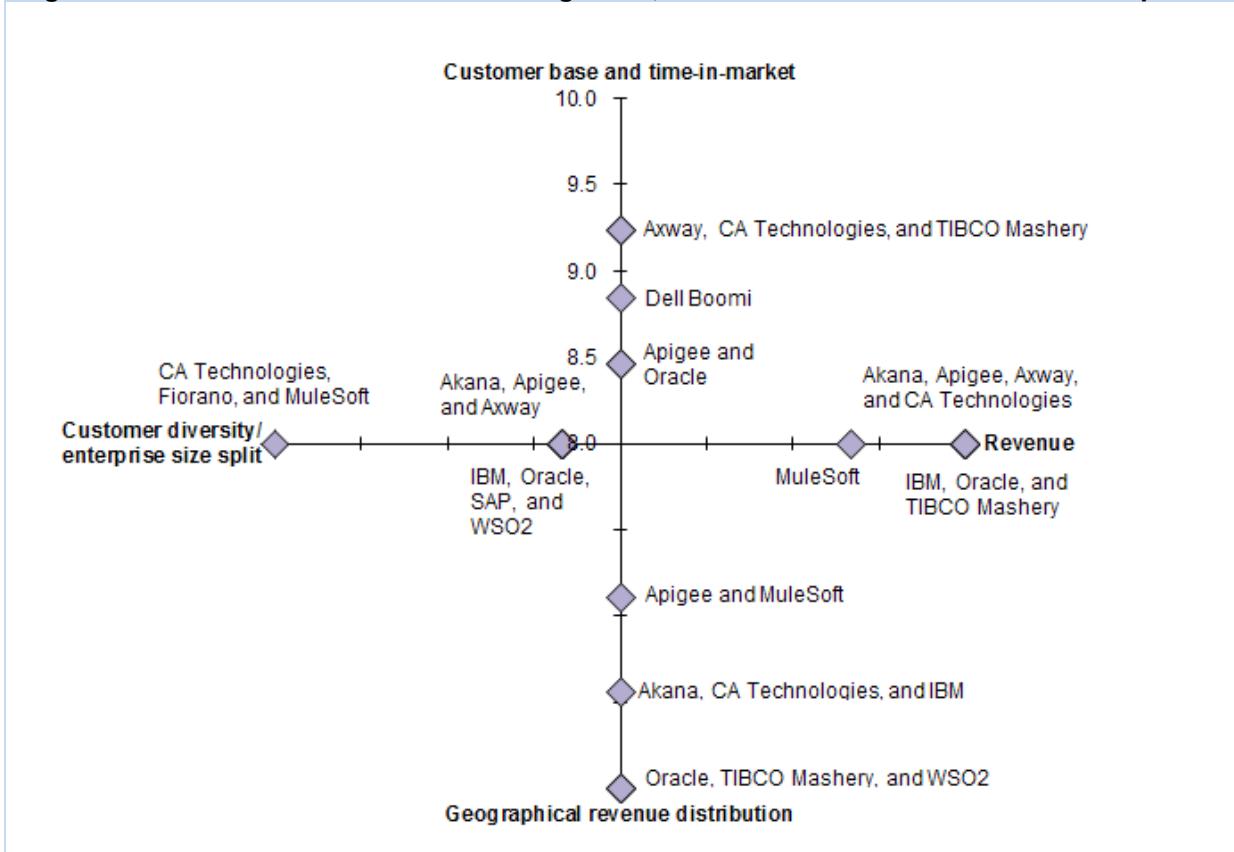
IBM, CA Technologies, and Apigee have top three scores against the evaluation parameters covered under “product strategy, scalability, and enterprise fit” criteria group. The innovation offered by an API management solution in terms of product strategy, architecture, and commercial model is a key differentiating feature and an indicator of long-term product roadmap and execution commitment.

All the leaders scored well in this category. Axway, Apigee, CA Technologies, MuleSoft, Tibco Mashery, and WSO2 have high scores for the “deployment” criteria group.

Vendors with high scores across both technology and execution dimensions demonstrate a good balance between product and commercial strategies, and have established a leading competitive positioning.

## Market leaders: market impact

**Figure 7: Ovum Decision Matrix: API management, 2016-2017 market leaders - market impact**



Source: Ovum

Figure 7 shows the vendors with the top three scores within the range of 8-10 (on a scale of 1-10, including those with same scores) for each category of the ODM market impact dimension. The overall market impact score is predominantly based on the corresponding vendor score for “customer based and time-in-market” and “revenue” criteria groups.

Axway, CA Technologies, and Tibco Mashery achieved the highest scores for the “customer base and time-in-market” criteria group, followed by Dell Boomi, and Apigee and Oracle. All leaders scored well against evaluation parameters covered under the “revenue” criteria group.

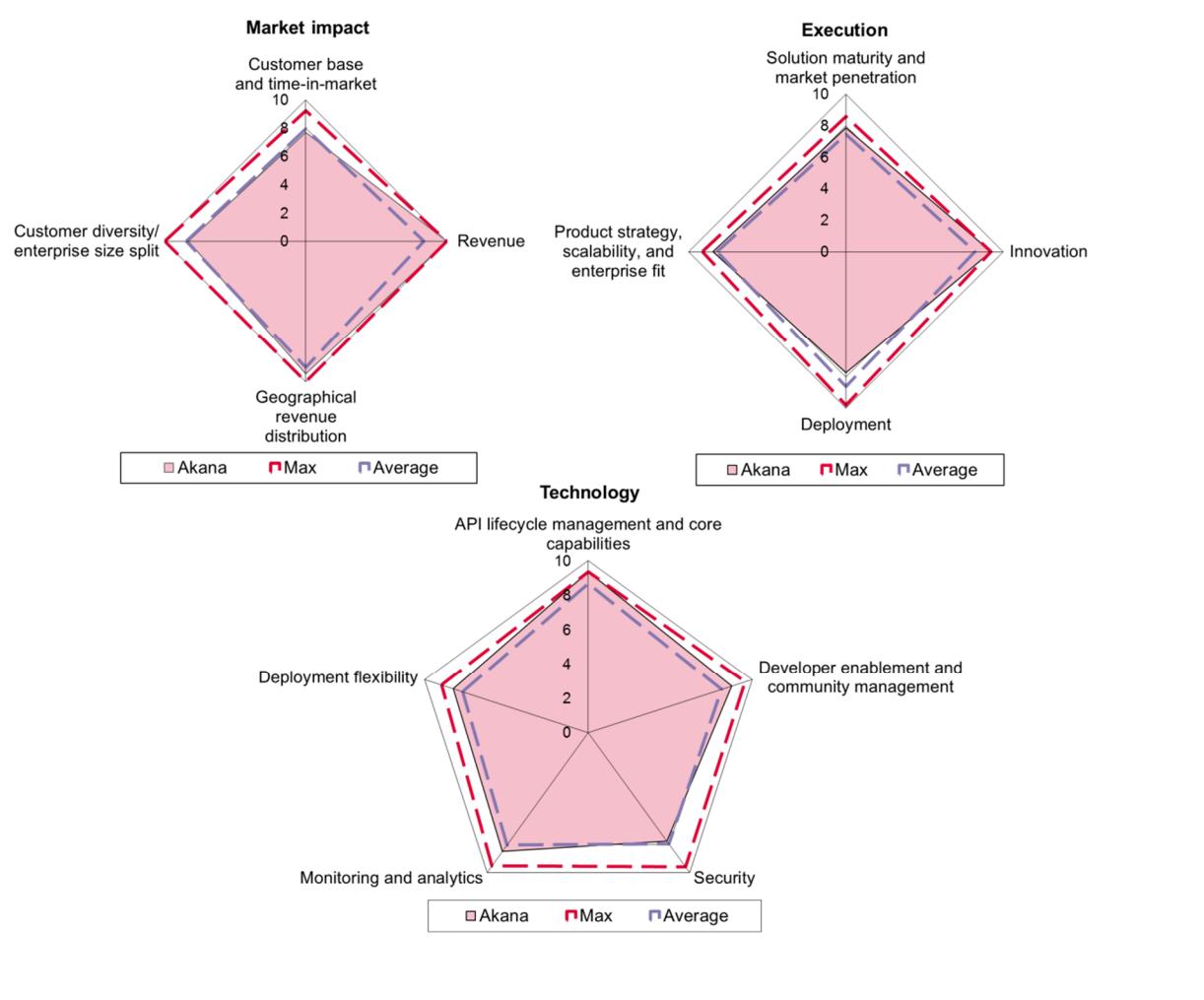
Oracle, Tibco Mashery, and WSO2 achieved the highest scores for the “geographical revenue distribution” criteria group. Akana, CA Technologies, IBM, Apigee, and MuleSoft also achieved good scores for this criteria group. This score is a direct indicator of the evenness of revenue distributed across three key regions: Americas (North, Central, and South America), EMEA, and Asia-Pacific.

All vendors except for Dell Boomi and Tibco Mashery achieved a score above 8 for “customer diversity/enterprise size split” criteria group. This score indicates the evenness of customer base distribution across small and medium-sized enterprises (SMEs) and large enterprises. The last two criteria groups under “market impact dimension” were assigned minimal weighting (5% each).

## Vendor analysis

Akana (Ovum recommendation: leader)

**Figure 8: Akana radar diagrams**



Source: Ovum

### Ovum SWOT Assessment

#### Strengths

##### Well-integrated, robust, end-to-end API management offering

SOA Software was renamed Akana in March 2015. It offers a well-integrated, end-to-end API management solution enabling developer community management and engagement, service transformation and orchestration, API lifecycle management, API security, and API analytics and monitoring. Akana's API management solution offers robust API lifecycle management and core capabilities and it achieved highest score for this "evaluation category" of all the vendors included in this Ovum decision matrix. Akana Envision offers deeper business and operational analytics for enterprise API initiatives, which also allows policy-based data collection for meeting regulatory and security compliance mandates. Akana's API management solution simplifies API publishing and

consumption via support for translation between key API description languages. From a broader perspective, Akana has a well-balanced offering that aligns with both developer and business-centric approaches to enterprise API initiatives. Other key features and capabilities include support for multi-datacenter geographic distribution, easy integration/federation with key identity and access management (IAM) solutions, and support for private cloud, public cloud, and hybrid deployment models.

### **Aggressive product development strategy for supporting emerging requirements of enterprise API initiatives**

Akana is a front-runner in supporting DevOps automation for API management, and enables discovery, scaling, security administration, routing, and auditing of microservices across a range of containerization and cloud environments. We expect lightweight API management to emerge as a middleware layer simplifying microservice orchestration and management, and Akana has developed a good foundation for exploiting this market opportunity. Over the last 12 to 18 months, Akana has expanded features and capabilities of its API management solution in areas including API security and identity federation, SaaS integration, API analytics, multi-data center deployment, industry and regulatory compliance mandates, community management, and API publishing and consumption. Akana continues to execute well against an aggressive product roadmap and has made good progress in terms of growing its customer base and partner network.

### **Weaknesses**

#### **Relatively limited marketing and outreach outside the Americas**

While as an API management vendor Akana enjoys good brand recognition in the Americas, its corresponding marketing efforts for Europe and Asia-Pacific regions lag behind those of some of its key competitors. While the expansion of its partner network is a move in the right direction, Akana should focus on strengthening its marketing efforts to improve its competitive positioning against major and specialized API management vendors with a better foothold in these regional markets.

### **Opportunities**

#### **Digital transformation and microservices-centric initiatives**

Akana has already supported a number of enterprises undertaking API-led digital transformation initiatives and has the capability to function as a strategic partner in these initiatives. This is increasingly a key requirement for tactical enterprise API initiatives focusing on using APIs as flexible interfaces to digital services and business models. Microservices architecture (MSA) is gaining ground as a software architectural style for the development of distributed and decoupled applications, and MSA implementations can benefit from the use of API management as a facade for microservice orchestration and management. Akana is rapidly developing its product offering (including a microservices gateway) to support microservices-based application development initiatives.

### **Threats**

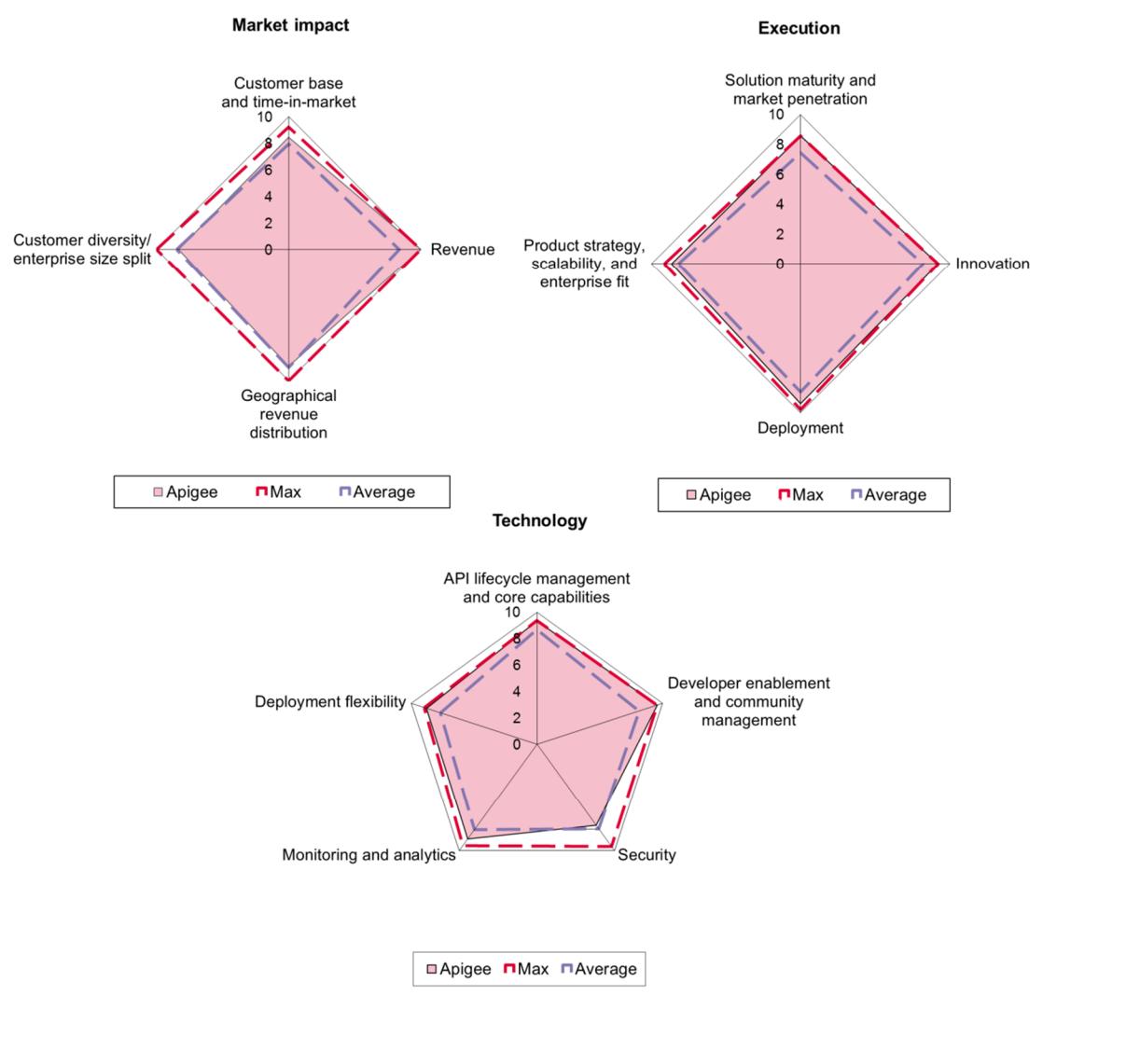
#### **Major middleware vendors are strengthening their API management credentials**

Many major middleware vendors have strengthened their API management offerings over the last 12 to 18 months, and others have used acquisitions and partnerships to develop their competitive positioning in this middleware market segment. Several major middleware vendors offer API management as an extension to their middleware stack, often as a component of a broader solution to

complex hybrid integration needs. Akana will face significant competition for deals involving enterprises that have an existing relationship with a major middleware vendor offering API management.

## Apigee (Ovum recommendation: leader)

**Figure 9: Apigee radar diagrams**



Source: Ovum

## Ovum SWOT Assessment

### Strengths

**Mature and well-rounded API management offering strengthened by an aggressive product strategy**

Apigee offers a combination of a unified API platform (API Edge) and big data predictive analytics (Apigee Insights) along with technical and business consulting/digital strategy services to cater for the

infrastructure and tactical requirements of enterprise API initiatives. Apigee's API management offering is functionally rich and mature, and Apigee achieved high scores (including top scores) across the technology and execution evaluation dimensions, including for key criteria groups, such as API lifecycle management and core capabilities, developer enablement and community management, monitoring and analytics, as well as product strategy, scalability, and enterprise fit, and innovation, solution maturity, and market penetration. Ovum's conversations with enterprise customers indicate Apigee's sound positioning as an API management vendor for a range of use cases, including API-led digital transformation initiatives.

Last year Apigee introduced an IoT platform (Apigee Link) enabling API-led device connectivity, data streaming between devices, applications, and the cloud, and protocol mediation, as well as offering mobile and platform SDKs, and identity and security features. Over the last six to nine months, Apigee has expanded the features and capabilities of its API management offering in areas such as hybrid cloud architecture and lightweight API management, API design and testing, API security, and private cloud deployment.

Its recent financial results indicate strong momentum and impressive business growth, and we expect that Apigee will continue to execute well against an aggressive product strategy. Apigee's product marketing and sales strategies are increasingly balancing developer and business-centric approaches to API management, resonating with a broader set of end users, stakeholders, and enterprise decision-makers.

### **Apigee is a pioneer in evangelizing and supporting API-led digital transformation**

Apigee has exploited its first-mover advantage in this space to develop significant competitive differentiation against key competitors. Apigee has an impressive track record as a strategic partner to enterprises exploiting APIs for digital transformation initiatives. In its product marketing it has used evangelism as a key approach to target hands-on technologists and IT decision-makers. Technical education and trainings imparted by Apigee Academy and API conferences and workshops delivered by Apigee have added to its credentials as a leading API management vendor for digital transformation initiatives.

### **Weaknesses**

#### **Solution pricing and footprint in European region**

The investment proposition for Apigee's API management offering that is suitable for medium to broad-level enterprise initiatives is relatively high in comparison to some of its competitors. While Apigee Edge SMB is optimally priced and is a good move in the right direction, Apigee would benefit from an expanded version offering greater features and access privileges to minimize the gap between SMB and full-fledged/enterprise versions. Apigee Edge SMB aligns with the requirements of specific use cases with a medium level of complexity.

Despite Apigee's experience and the maturity of its API management offering, the share of business attributable to enterprises based in Europe is lower than some of its key competitors. We expect that its ongoing efforts to expand footprint in European region will deliver significant results in the near future. This is a clear growth opportunity for Apigee.

### **Opportunities**

#### **Emerging API management use cases**

Microservices-centric implementations and enterprise IoT initiatives represent good market opportunities for Apigee. Apigee has undertaken marketing and evangelism around the role of APIs and API management in microservices-based software architecture and is using PaaS for running microservices and APIs, which is a good move in terms of developing visibility and reference points for potential sales opportunities.

With the introduction of Apigee Link, Apigee is well placed to exploit market opportunity associated with enterprise IoT initiatives. On a comparative basis, Apigee Link is an unusual offering from an established API management vendor, and provides a range of capabilities for IoT integration, analytics, and application development.

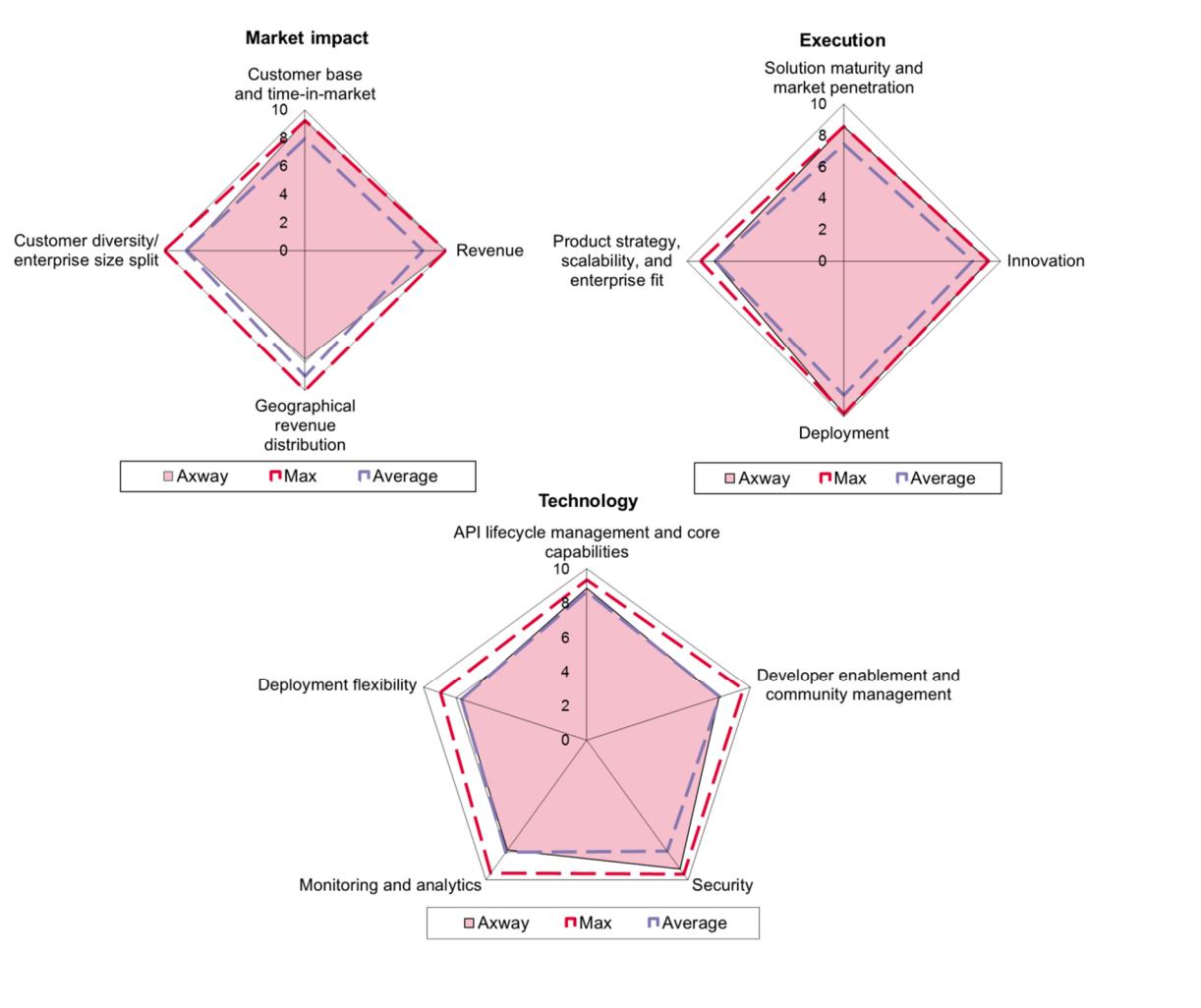
### *Threats*

#### **Comprehensive middleware suite/stack vendors targeting digital transformation opportunities**

Apigee will face significant competition from major vendors offering middleware suites/stacks catering for an extensive set of integration requirements of digital business/transformation initiatives. These vendors can deliver integration capabilities beyond API management and adjoining use cases, and frequently exploit existing relationships with enterprises embarking on digital business/transformation initiatives to secure additional business. Some of these vendors have also developed significant competencies in API technical and strategy consulting services. In this context, Apigee has made some progress via partnerships with SAP and Pivotal Cloud Foundry to better support customers that need a broader middleware stack for meeting a range of integration, application development, and API management requirements.

## Axway (Ovum recommendation: leader)

**Figure 10: Axway radar diagrams**



Source: Ovum

### Ovum SWOT Assessment

#### Strengths

##### Well-established end-to-end API management offering for a range of use cases

Axway's unified API management solution enables development, delivery, management, and security of enterprise APIs. Axway's API management solution supports a wide range of use cases and is a mature offering in this space. Axway offers an extensible and customizable API portal that can be deployed on-premise or in the cloud. It has one of the largest customer bases in this middleware market segment. Axway is one of the few vendors that achieved balanced scores across key criteria groups under the technology evaluation dimension, including "API lifecycle management and core capabilities", "developer enablement and community management", security, and "monitoring and analytics".

#### Robust API security features and capabilities

Axway delivers an extensive set of API security capabilities across four key areas: interface security, access control, data security, and API key management. Axway API Gateway can function as an integrated policy enforcement point that enables users to enforce and govern policies related to access control, performance and quality-of-service (QoS), compliance and audit, and data security and privacy. These policies can be enforced and monitored across APIs, SOA, SaaS, and mobile integrations. The API Gateway provides support for transport-level security, encryption, and signing, and supports a wide range of security standards, including WS-Security, Kerberos, XACML, SAML, OAuth 2.0, JSON web signature, PKCS #7, #11, and #12. Customer references indicate strong trust in the Axway API management solution's data security and privacy-related capabilities. Axway is a prominent API management vendor in the financial services industry and its solution is frequently used for supporting digital business initiatives exposing mission-critical data assets/services.

#### **Strong credentials in supporting “B2B + API” use cases**

Axway has used the acquisition of Vordel to cross-sell API management to its existing B2B integration customers. Axway is a front-runner in supporting “B2B + API” use cases and its marketing messaging on “data flow governance” resonates well with enterprises that need to enforce end-to-end governance over consumption of enterprise data assets, services, integration capabilities, and back-end applications via APIs. Axway has supported several leading-edge digital transformation implementations involving extension of B2B/EDI and MFT capabilities via APIs.

#### **Weaknesses**

##### **Axway should strengthen its presence and reach in emerging markets**

Because Axway is one of the more experienced vendors in the global API management market, the percentage of revenue attributed to customers in Asia-Pacific is smaller than some of its key competitors, and Axway also has relatively limited presence and reach (direct and via partners) in emerging markets, including Asia-Pacific and Central and South America. Axway should focus on expanding its presence in these rapidly growing markets to effectively compete with API management vendors with well-established footprints in emerging markets.

#### **Opportunities**

##### **API-led digital transformation initiatives**

Ovum has identified API-led digital transformation initiatives as a key integration trend for 2016 and beyond, and this represents a rapidly growing market opportunity for middleware vendors with a well-established API management offering. Axway has supported several transformational initiatives involving the mobile-enablement of existing business processes, API-led M2M communications, and “B2B + API” use cases. Moreover, it has the competence to help customers define API strategy, including API design and solution architecture aspects. Axway recently acquired Appcelerator, a mobile app development platform vendor to strengthen the mobile integration, performance, lifecycle management, and monetization capabilities of its API management offering. In the near term, Axway plans to introduce new features and strengthen capabilities in areas such as simplified API-led consumption of MFT capabilities across various flavors, prebuilt operational intelligence comprising the monitoring of customer experience for monetization, microservices orchestration and management, and IoT and UX SDK and an enriched data model for different personas/participants and devices.

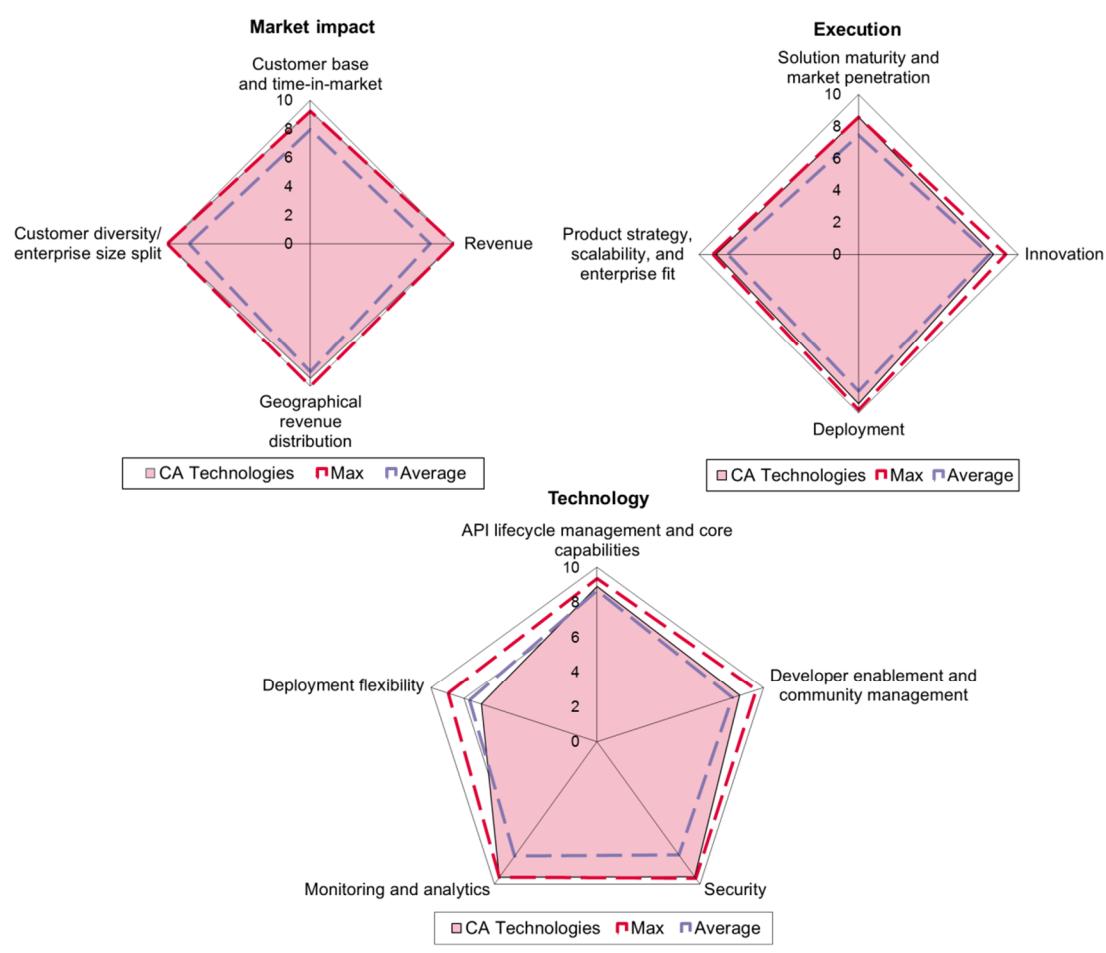
### *Threats*

#### **Major middleware vendors are offering API management solutions**

Major middleware vendors including IBM and Tibco have established strong footprints in the large enterprise segment with API management offered as a component of a comprehensive middleware stack that can cater for on-premise, B2B, cloud, and mobile integration needs. These vendors have developed strategic customer relationships, which are used to sell API management solutions as an add-on to their existing middleware platforms. Axway will continue to face stiff competition for deals where an enterprise is already using integration platforms offered by the major middleware vendors.

## CA Technologies (Ovum recommendation: leader)

**Figure 11: CA Technologies radar diagrams**



Source: Ovum

### **Ovum SWOT Assessment**

#### *Strengths*

#### **Comprehensive features and capabilities across key API management pillars**

CA API Management is one of the most comprehensive API management offerings available in the market. CA Technologies has expanded on the strong credentials of Layer 7 Technologies and is well recognized for the robust API/data/service security capabilities of its API management solution. CA Technologies achieved the highest overall score for the technology evaluation dimension, and also achieved high scores across key criteria groups, including API lifecycle management and core capabilities, developer enablement and community management, security, and monitoring and analytics. CA Technologies enjoys good brand recognition in the API management market and has one of the largest customer bases, including large enterprises based in North America and Europe.

### **Good execution track record and robust product strategy**

CA Technologies continues to execute well against an aggressive product strategy and roadmap. It achieved high scores across key criteria groups under the execution evaluation dimension, including solution maturity and market penetration; product strategy, scalability, and enterprise fit; and innovation. Product announcements made at CA World 2015 in areas such as enterprise API creation and secure data exposure, mobile app services, and “API management-as-a-service” resonate with the evolving requirements of mobile application developers, integration practitioners/architects, and digital business leaders focused on exploiting APIs to support key business imperatives and opportunities.

Recent developments indicate that CA Technologies is expanding toward an end-to-end API platform offering API creation, lifecycle management, developer and community management, security, and productization capabilities. CA API Management has registered impressive growth in terms of revenue and customer base over the last 12 to 18 months.

### **Weaknesses**

#### **CA Technologies should focus on expanding footprint in the Asia-Pacific region**

The Asia-Pacific region represents a rapidly growing market for API management solutions, which is especially relevant to the interests and strengths of CA Technologies, as robust end-to-end security is a key imperative for some of the most extensive API-centric initiatives undertaken by enterprises based in this region. Its footprint in the Asia-Pacific region is not in line with competitive positioning in the global API management market. CA Technologies should focus on expanding its footprint to effectively compete with major API management vendors in this region. This is more of an area for improvement rather than a weakness. It has already made some progress in this regard over the last 6 to 12 months.

### **Opportunities**

#### **API-led digital transformation initiatives**

CA Technologies is well placed to function as a strategic partner to enterprises that need various software capabilities and API strategy and technical consulting services to achieve success with API-led digital transformation initiatives. CA API Academy provides API strategy consulting services, and also conducts API design and architecture boot camps on a regular basis. An internal professional services team and systems integrator (SI) and value-added reseller (VAR) partner network augments its services capabilities in this area. We expect API-led digital transformation initiatives to be a key driver of the adoption of API management solutions over the next two to three years.

#### **Mobile and IoT application development initiatives**

CA Mobile App Services as an extension of CA API Management offer a set of common back-end services exposed as open source SDKs and open APIs to simplify mobile and IoT application development. With this approach, CA Technologies enables accelerated mobile and IoT application development, while exploiting the security capabilities of CA Mobile API Gateway to enforce end-to-end security. The value proposition of this combination, which can be extended to include CA Live API Creator, is attractive for mobile and IoT application developers struggling with the alternatives such as MBaaS and MADP solutions due to a lack of support for agile tool deployment, limited developer productivity features, and a high up-front expenditure/investment proposition. We expect CA Technologies to gain significant traction in the enterprise mobile and IoT developer community with these new products and capabilities.

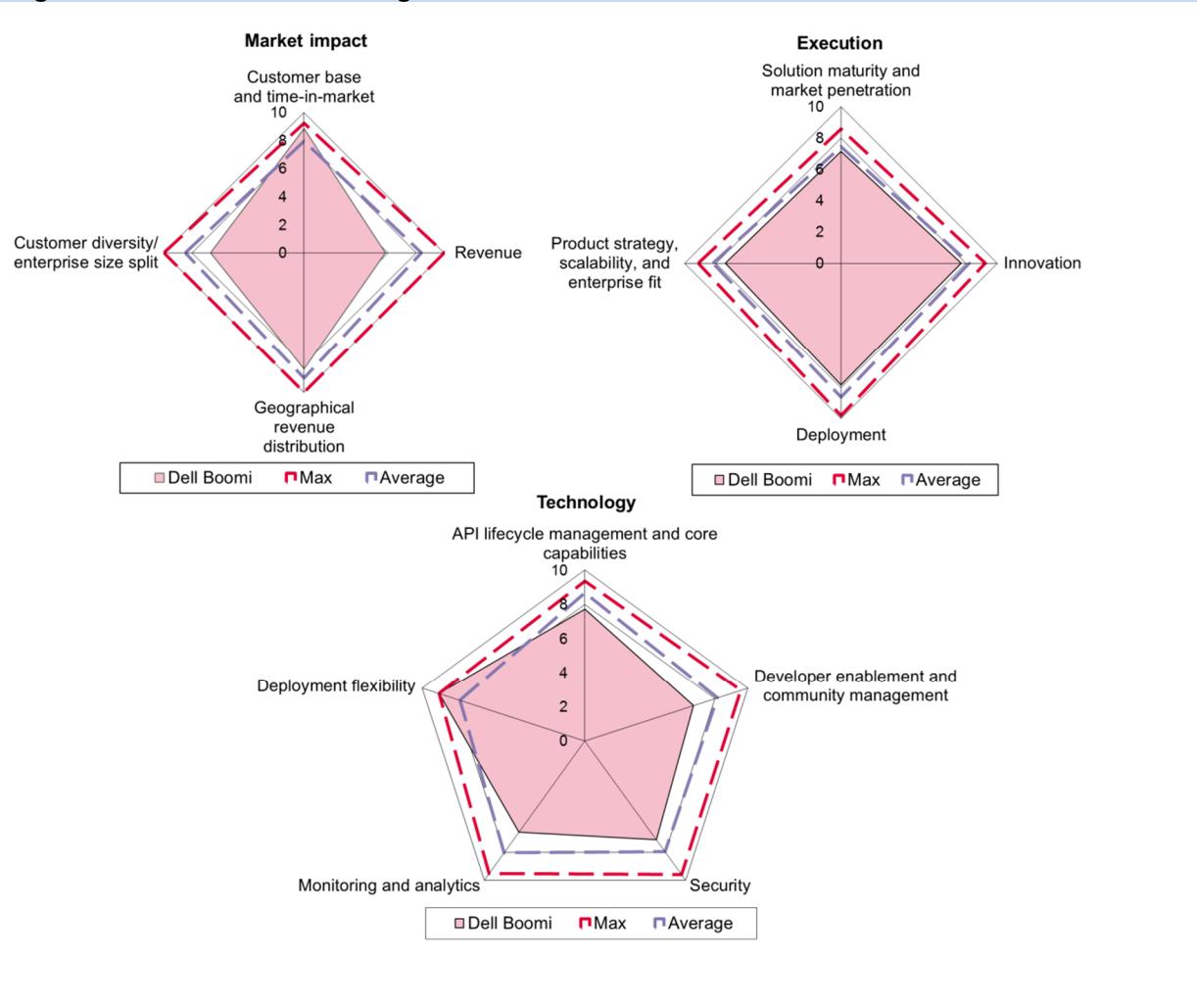
### *Threats*

#### **Major middleware vendors are offering comprehensive enterprise integration suites/stacks**

There are several cases where enterprises need a comprehensive and cohesive middleware stack to meet integration the requirements of digital business initiatives. While these initiatives frequently use APIs for agile integration and exposing enterprise data assets/services to support the development of new applications and business models, API management is only a component of a broader middleware stack required for supporting a range of integration requirements. Major middleware vendors offering compressive middleware suites/stacks to meet diverse requirements of a mix of on-premise, cloud service, mobile application, and B2B integration use cases are better placed to support tactical and broader initiatives involving the use of APIs.

## Dell Boomi (Ovum recommendation: challenger)

**Figure 12: Dell Boomi radar diagrams**



Source: Ovum

### Ovum SWOT Assessment

#### Strengths

##### Dell Boomi is a front-runner in supporting “iPaaS + API management” use cases

Dell Boomi API Management is key component of Dell Boomi's middleware-as-a-service portfolio, which includes AtomSphere iPaaS and cloud-based MDM solutions. The API management solution offers capabilities across API creation, publishing, and governance, and complements AtomSphere iPaaS's core integration capabilities. Dell Boomi has a strong presence in the small-and medium-sized enterprise (SME) segment and a growing footprint in the large enterprise segment.

The dedicated API management offering builds on the web service API Management capabilities of AtomSphere iPaaS, which allows integration processes to be transformed into web services that can be deployed on-premise or in Boomi's Atom Cloud. The combination of Dell Boomi iPaaS, MDM, and API management provides a significant competitive differentiation over those offered by other specialized iPaaS vendors.

### **Strong growth in adoption and a rapidly evolving product strategy**

The adoption of Dell Boomi's API management solution has grown at a rapid pace since its introduction in the first half of 2015, and interestingly, Dell Boomi has the highest number of customers (of all the vendors included in this ODM) using an API management solution. Dell Boomi is implementing a rapidly evolving product strategy, with a near-term focus on usage reporting, policy management, better visibility into end-to-end management, and IoT integration.

### **Weaknesses**

#### **Relatively limited developer enablement, security, and monitoring and analytics capabilities**

This can be largely attributed to the coupling of Dell Boomi's API management product strategy with the existing requirements of AtomSphere iPaaS users. Dell Boomi would benefit from expanding the features and capabilities of its iPaaS solution in areas such as developer enablement and collaboration, operational and business analytics, multi-factor authentication, and identity federation.

Dell Boomi should focus on developing this offering as a standalone API management solution capable of meeting a range of complex internal and external API management requirements, and Dell Software's existing security and analytics capabilities can readily fill some of these gaps in Boomi's API management proposition.

### **Support for tactical enterprise API initiatives**

While Dell Boomi's API management solution can cater for a range of "iPaaS/integration + API management" use cases, there are still gaps that need to be filled to effectively meet the requirements of tactical enterprise API initiatives. API-led digital transformation is a key theme in the API management market space, and vendors need to offer more than a piece of software to help enterprises achieve success with these initiatives. In this context, Dell Boomi should focus on strengthening its API technical and strategy consulting services to function as a strategic partner to enterprises embarking on digital business/transformation initiatives involving the use of APIs.

### **Opportunities**

#### **Rapidly growing middleware-as-a-service market opportunity**

Middleware-as-a-service is a rapidly growing market opportunity and Dell Boomi is a leading iPaaS vendor with a strong track record of helping customers achieve success with a cohesive combination of cloud-based iPaaS, MDM, and API management capabilities. Dell Boomi has achieved significant success in cross-selling API management to existing iPaaS vendors. Moreover, only a few vendors can compete with Dell Boomi when it comes to customer retention and engagement and a dedicated product strategy aimed at SMEs. Dell Boomi API management in its current state is one of the lowest cost solutions available.

### **Threats**

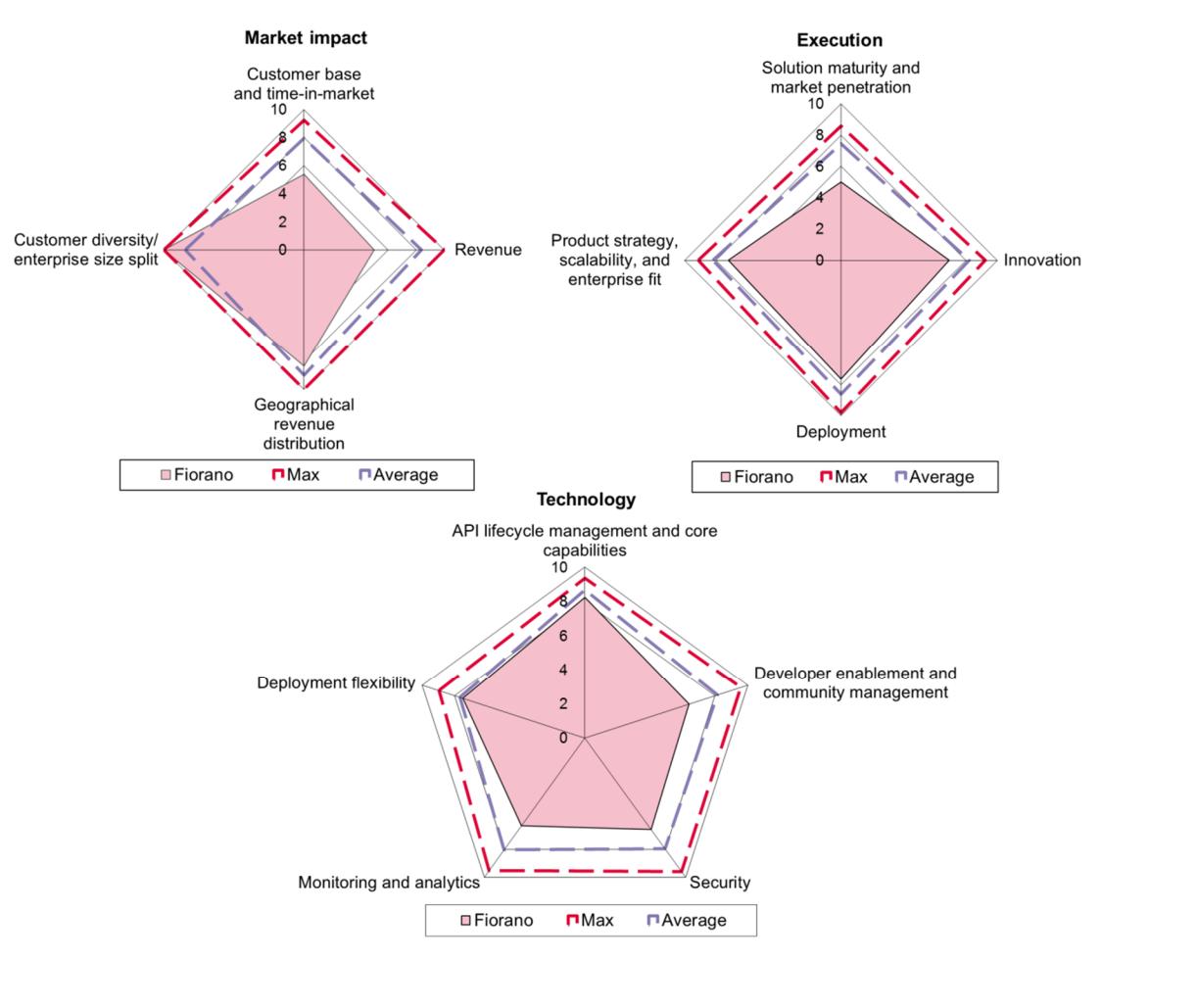
#### **Established, standalone API management solution vendors**

Dell Boomi will face stiff competition from established, standalone API management solution vendors for a range of use cases. These vendors offer API management solutions that can meet the requirements of internal and external API management, with robust developer enablement, lifecycle management, security, and analytics capabilities. Some of these vendors have developed significant

competencies in terms of API technical and strategy consulting services and can function as a strategic partner to enterprises pursuing digital business/transformation initiatives.

## Fiorano (Ovum recommendation: follower)

**Figure 13: Fiorano radar diagrams**



Source: Ovum

## Ovum SWOT assessment

### Strengths

#### An evolving API management offering based on a mature middleware foundation

Fiorano announced the general availability of its API management solution in December 2014. It is an extension of Fiorano's middleware stack that builds on a mature foundation comprising Fiorano's ESB/SOA platform. It supports all types of API exposure (internal, public, and private/partner APIs) and offers features and capabilities across a range of areas including API creation, mediation, developer enablement and community management, security and monitoring, and analytics. Fiorano API management is reasonably priced, and well suited for the "integration + API management" requirements of existing Fiorano ESB/SOA platform customers. Fiorano API management can be

used both on a standalone basis and on top of middleware provided by other vendors. Adoption trends indicate that a significant number of enterprise customers are using the Fiorano API management solution along with middleware platforms (including ESB/SOA infrastructure) offered by other vendors.

#### **API management as an extension of Fiorano's middleware stack**

Fiorano offers a range of middleware solutions catering for the requirements of on-premise, cloud, B2B, and mobile application integration. Fiorano API management is a natural fit for the extension of these integration capabilities via APIs. Fiorano has already supported implementations involving the extension of SOA services beyond the firewall and mobile-enablement of enterprise applications and services.

#### **Weaknesses**

##### **Limited visibility across the wider API management vendor landscape**

Fiorano is a relatively new entrant to the API management market. With its focus on cross-selling API management to existing middleware customers, there is limited visibility and brand recognition for its API management solution, especially among enterprises interested in using a standalone API management solution for meeting a range of internal and external API management requirements. Fiorano's marketing efforts lag behind those of its nearest competitors, and its credentials in supporting strategic and complex enterprise API initiatives (including via API technical and strategy consulting services) have yet to be established.

##### **Developer enablement, security, and monitoring and analytics capabilities**

In the context of developer enablement and community management, Fiorano should focus on expanding/adding capabilities in areas such as easy sign-on via different social platforms, API catalog, portal customization, developer collaboration, and support for API cloning.

Support for federation with common enterprise IAM solutions, enforcement of authorization policies at the network edge, and proxying of mobile streaming protocols would strengthen its security capabilities. Richer analytics on API consumption and operational KPIs, better support for API monetization, alerts for tier breaches, and the automation of specific analytics functions would fill gaps in terms of its monitoring and analytics capabilities.

#### **Opportunities**

##### **Applicability to a broader set of API management use cases**

There are significant opportunities for Fiorano in terms of supporting emerging and key API management use cases, as well as developing deeper engagement with existing middleware customers. In this context, Fiorano API management can be used to support a range of use cases, including "B2B integration + APIs" (with Fiorano B2B gateway), IoT integration and messaging (with Fiorano MQTT), mobile application integration, and "cloud integration + API management".

The other significant opportunity would require the delivery of API management on a standalone basis or on top of middleware provided by other vendors. Fiorano should focus on implementing a dedicated and aggressive product marketing strategy for its API management solution.

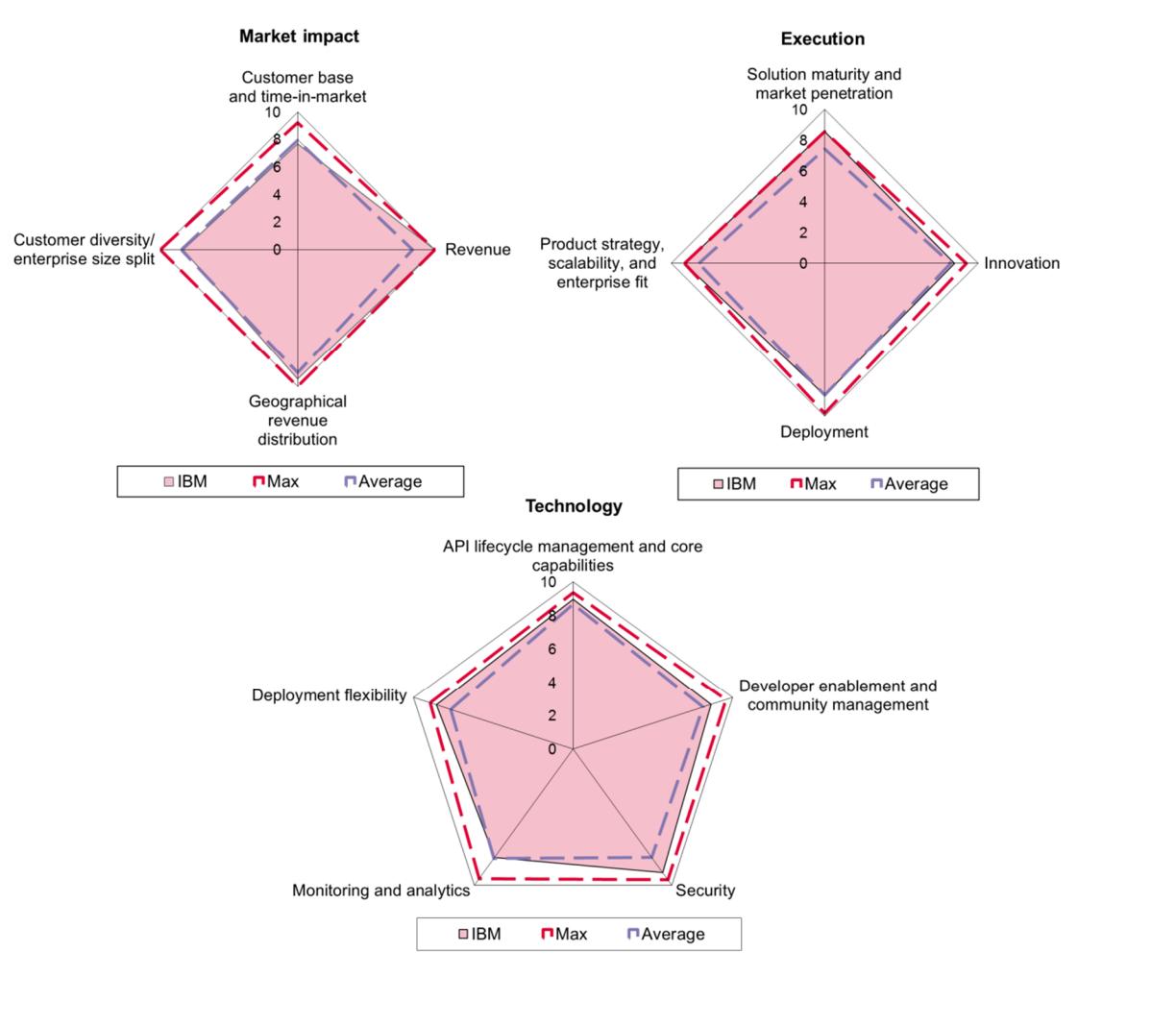
#### **Threats**

##### **ESB/SOA middleware vendors with established or substantial API management credentials**

With its near-term focus, Fiorano's real competitors are ESB/SOA middleware vendors offering API management. Fiorano will face significant competition from major and specialized middleware vendors with established or substantial API management credentials. This is especially applicable for opportunities in the North America, Western Europe, and Asia-Pacific regions.

## IBM (Ovum recommendation: leader)

**Figure 14: IBM radar diagrams**



Source: Ovum

## Ovum SWOT assessment

### Strengths

#### Well-established market position as a leading global middleware vendor

IBM is the largest middleware vendor in terms of market share, and its API management solution offers a simple extension of the integration capabilities provided by IBM WebSphere middleware platforms to cater for a range of use cases. Only a few middleware vendors can provide such an extensive set of integration capabilities required for supporting digital business initiatives. With several strategic initiatives and resources, such as IBM developerWorks, the BlueMix platform, and the "API

economy" pushing the case for API management, we expect rapid growth in the adoption of IBM API management solution, including when it is consumed as a cloud service.

### **End-to-end offering for API-led digital transformation initiatives**

IBM offers a compelling set of end-to-end API management capabilities and strategy consulting services, with an increased focus on driving ease of use and developer productivity, and simplifying the governance of enterprise API initiatives exposing digital assets for the development of new applications/services, channels, and business models. IBM's extensive, dedicated consulting services organization can function as a strategic partner to enterprises embarking on digital transformation initiatives. Customer references revealed significant success of IBM's engagement model aimed at large enterprises undertaking API-led digital business initiatives.

### **Aggressive product and marketing strategy**

IBM has made significant investments as part of an aggressive market push aimed at driving adoption of its API management offering. Recent announcements about API economy and more specifically, the introduction of the API Harmony offering elevated developer experience via cognitive capabilities, such as intelligent mapping and graph technology, are some of the key differentiators that form a potent combination with IBM's core competencies in end-to-end API management and strategy consulting services. Moreover, StrongLoop acquisition complements IBM API management solution in terms of an integrated API platform enabling development of scalable APIs and microservices, as well as delivering end-to-end API management and simplifying backend integration across mobile, IoT and web applications initiatives.

### **Weaknesses**

#### **More clarity in market messaging will simplify selection for various use cases**

IBM's API management proposition has gradually evolved from WebSphere Service Registry and Repository and Cast Iron Live offerings to a next generation API management solution. Since then, IBM has undertaken several marketing and rebranding exercises, including those focusing on new product features and consumption/delivery models. While it is always good to offer more choices/combinations to customers, IBM would benefit from clearer messaging helping customers select most appropriate and cost-effective option for meeting the requirements of their specific initiatives. For example, IBM can better exploit its extensive middleware portfolio by clearly specifying what IBM API Management (on-premise and cloud-based) can deliver on a standalone basis, and in combination with other IBM middleware and application platforms.

### **Opportunities**

#### **Positioning as a strategic partner for digital business initiatives involving APIs**

Enterprises more often than not need a strategic partner to achieve success with digital business initiatives involving the use of APIs. Vendors can no longer maintain competitive positioning by just selling a piece of software allowing users to develop, securely expose, and govern APIs, and it is now more about providing support and essential guidance via strategy and technical consulting services to help ensure the success of API-centric digital business initiatives. IBM is well placed to exploit this rapidly growing market opportunity with its comprehensive set of strategy consulting and API technical services.

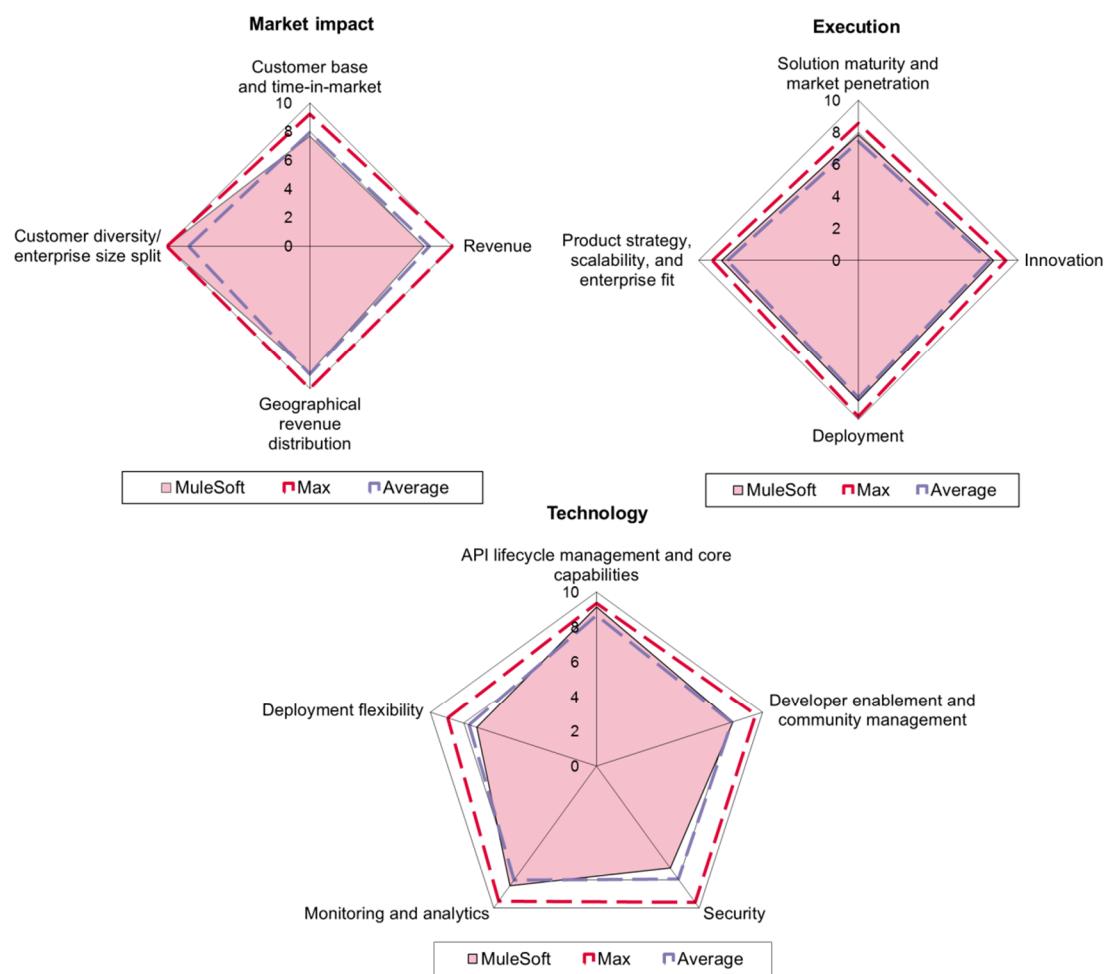
## Threats

### Increasing competition from major and specialized API management vendors

The level of competition in the API management vendor landscape has increased to a great extent with several key vendors including Tibco (largely via its Mashery acquisition), MuleSoft, and Axway expanding features and capabilities of their API management solutions over the last 12 to 18 months. Moreover, specialized vendors such as CA Technologies, Apigee, and Akana have strengthened the value proposition of their API management solutions, and continue to invest in product development and expanding their reach to new markets/regions.

## MuleSoft (Ovum recommendation: leader)

**Figure 15: MuleSoft radar diagrams**



Source: Ovum

## Ovum SWOT Assessment

### *Strengths*

#### **Strong foundation for a combination of enterprise integration and API management requirements**

API management is a key component of MuleSoft Anypoint Platform, which is marketed as a unified platform for API-led connectivity. MuleSoft's API management proposition builds on the robust integration capabilities offered by Mule ESB and CloudHub (MuleSoft's iPaaS solution), and is functionally rich in terms of API lifecycle management and core capabilities and monitoring and analytics, as well as supporting a range of developer-enablement and community management requirements. With this foundation, MuleSoft can support a wide range of API management use cases, including those involving the extension of on-premise, cloud service, mobile application, and B2B integration capabilities via APIs.

MuleSoft continues to be successful in building deeper and strategic relationships with enterprises interested in using a cohesive middleware suite for a combination of enterprise integration and API management requirements.

#### **Good balance between developer and business-centric approaches to enterprise API initiatives and API management**

With API technical and strategy consulting services included in the standard solution package, MuleSoft is well placed to function as a strategic partner for enterprises embarking on digital transformation initiatives. Customer references and recent wins indicate that MuleSoft is succeeding with a mix of developer and business-centric approaches to enterprise API initiatives and API management.

#### **Strong business growth and momentum**

MuleSoft is one of the fastest growing companies in the middleware market and registered 92% revenue growth on a year-on-year (YoY) basis in financial year 2015. MuleSoft has secured external financing of over \$250m since its inception in 2006 and this has provided financial muscle for executing aggressive product development and business growth strategies.

MuleSoft has a good track record in responding to emerging market trends and customer requirements, and it is no different with API management. It has expanded features and capabilities of its API management offering in areas such as an integrated development environment (IDE) for designing, building, testing, documenting, and sharing representational state transfer (REST) APIs aimed at the RAML community, test-driven integration and API mocking, a new gateway for scalable performance, OAuth policy enforcement, and delegated administration across various API provider groups.

### *Weaknesses*

#### **Relatively limited footprint outside Americas**

Considering MuleSoft's experience and growth as a middleware vendor, the share of revenue and customer base accounted for by enterprises based in Asia-Pacific and European regions is small. MuleSoft has the financial muscle required for expansion outside the Americas and should focus on exploiting the growing market opportunity in the Asia-Pacific and European regions.

### **Limited support for standard enterprise IAM systems**

Enterprises are interested in exploiting their existing investments in IAM systems, as well as using a simpler approach to identity federation and enforcement of access management policies. In this context, MuleSoft offers pre-built integration with only a few of the common enterprise IAM systems. It should therefore focus on providing built-in support for a wider range of security standards/protocols to simplify enforcement of end-to-end security across a range of users.

### *Opportunities*

#### **Digital transformation initiatives and emerging API management use cases**

The combined value proposition of MuleSoft's API management offering and technical and strategy consulting services is compelling for enterprises embarking on digital business/transformation initiatives involving APIs. Ovum believes that digital transformation will continue to be a key driver of growth in the adoption of API management solutions.

MuleSoft Anypoint Platform is capable of meeting a range of requirements of enterprise IoT initiatives (for example, integration and application development) and mobile application development, as well as supporting the extension of B2B integration capabilities via APIs. MuleSoft's product strategy aligns with the requirements of emerging API management use cases.

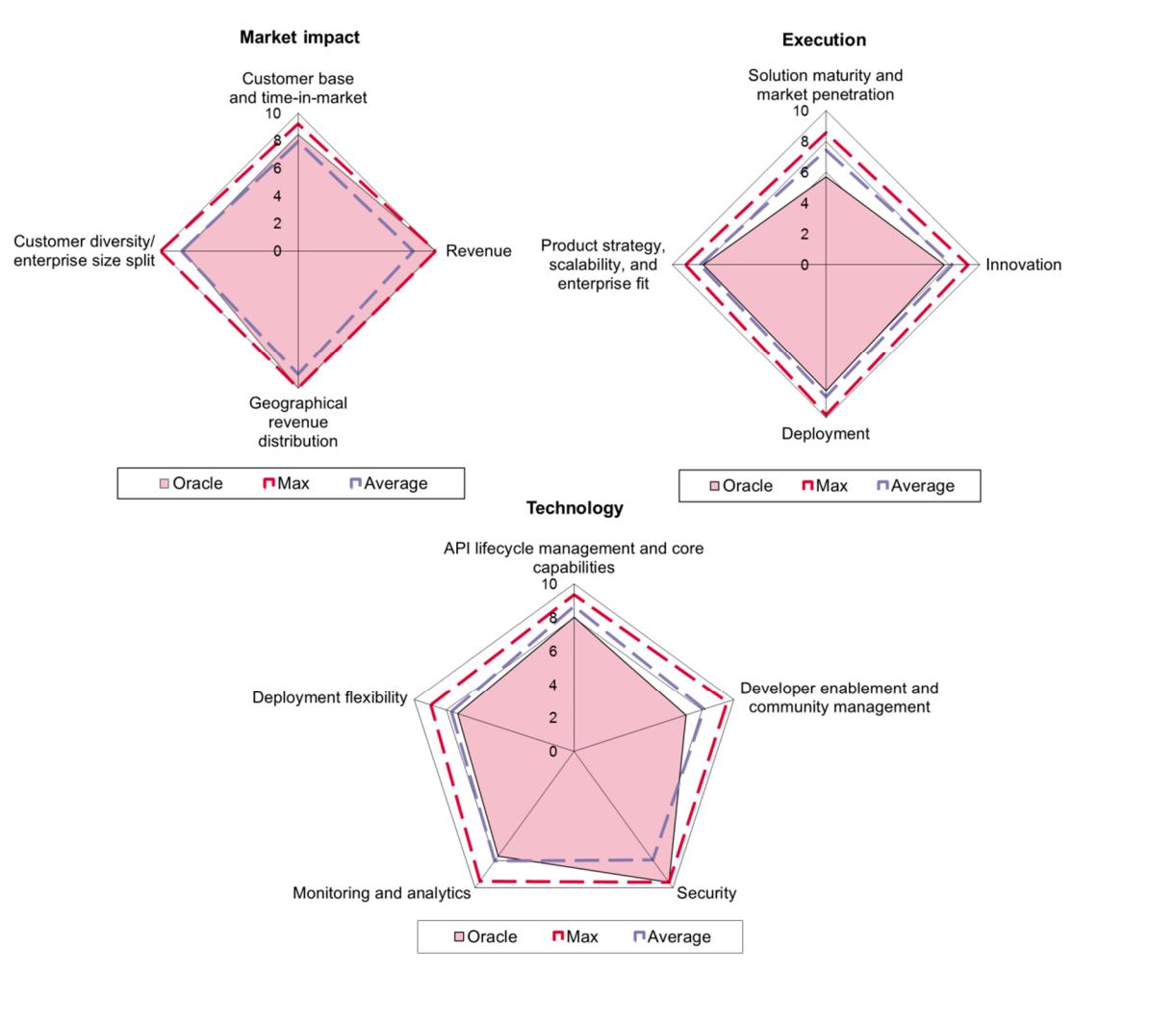
### *Threats*

#### **Major middleware vendors with robust or evolving API management credentials**

MuleSoft will face significant competition from major middleware vendors with robust or evolving API management credentials, especially as these vendors have a large number of enterprise customers that are prime targets for cross-selling API management. Large enterprises are generally inclined to use a homogenous and cohesive middleware stack, and this tendency frequently translates into the extension of existing middleware vendor relationships to support API management requirements.

## Oracle (Ovum recommendation: challenger)

**Figure 16: Oracle radar diagrams**



Source: Ovum

## Ovum SWOT Assessment

### Strengths

#### Well suited to the internal API management requirements of Oracle SOA Suite/Oracle Service Bus customers and other use cases

Oracle's API management proposition builds on its SOA governance (fine-grained service governance) credentials. However, it is rapidly progressing toward a unified, end-to-end API management offering. Oracle's on-premise API management offering uses the Oracle API Gateway in combination with the Oracle SOA Suite to support API lifecycle governance, API security, analytics, and community management needs.

In 2014, Oracle introduced Oracle API Catalog to simplify API publishing, discovery, and consumption, as well as driving reuse and functioning as a single source for visibility into internal and external APIs. In the third quarter 2015 Oracle introduced Oracle API Manager Cloud Service as a

component of Oracle SOA Cloud Service to enable API creation, publishing, community management, and security via the cloud.

Oracle's API management offering in its current state is well suited to the internal API management requirements of existing Oracle SOA Suite/ Oracle Service Bus customers. In particular, Oracle Service Bus allows the creation of proxy services that can be published as APIs (to Oracle API Manager Portal) for a range of back-end services. Moreover, Oracle Enterprise Repository, Oracle API Catalog, and Oracle API Gateway cater for specific requirements of various API management use cases.

Oracle's API management solution offers robust security capabilities, including support for a range of security protocols/standards, API security mechanisms, and common IAM solutions. Oracle's API management offering in combination with other components of the Oracle middleware stack can cater for a range of use cases, including "cloud integration + API management", mobile-enablement of back-end applications/services, "B2B integration + APIs", and IoT integration. Oracle is focusing on adding/expanding features and capabilities in areas such as support for hybrid deployment, API analytics, consumption plans, and custom policy enforcement and management.

### **Rapidly evolving product strategy**

Oracle is executing well against an aggressive product strategy focused on developing an API platform-as-a-service offering supporting end-to-end API management. Oracle API Manager Cloud Service is a part of Oracle's PaaS portfolio for integration, and this product segment has experienced rapid growth over the last five to six months. Oracle's focus on customer success is a key differentiator for the Oracle PaaS portfolio and we expect Oracle to succeed with a combination of software capabilities and technical and strategy consulting services aimed at digital business/transformation initiatives involving the use of APIs. Aggressive sales and marketing complement Oracle's product strategy, which is focused on driving adoption of its middleware-as-a-service portfolio.

### **Weaknesses**

#### **Oracle has been slow to respond to wider API management opportunities**

In the past, Oracle's API management offering focused mainly on meeting the API management requirements of exiting Oracle middleware customers, especially Oracle SOA Suite/Oracle Service Bus customers. While it has a strong foundation in terms of fine-grained service governance, Oracle has been slow in progressing with the development of an end-to-end API management solution capable of meeting a wider range of requirements. As a result, Oracle has a relatively weaker competitive positioning for external API management use cases and tactical enterprise API initiatives.

However, Oracle is executing well against an aggressive product strategy to develop an APIaaS offering supporting end-to-end API management. When it becomes generally available, this offering will significantly strengthen Oracle's competitive positioning in the global API management market.

#### **Relatively limited developer enablement and community management, and monitoring and analytics capabilities**

While Oracle's API management offering is suitable for the internal API management requirements of Oracle middleware customers, there are some gaps that need to be filled to meet the requirements of external API management use cases and tactical enterprise API initiatives. In this context, Oracle

should focus on expanding the capabilities of its API management offering in areas such as portal customization, developer support and collaboration, self-enrollment to appropriate API service tiers, API monetization, business/less-technical user enablement, and the import of Swagger representation.

## *Opportunities*

### **Use cases beyond internal API management**

With continued progress in developing an end-to-end API management offering and product development in adjacent areas, Oracle is working toward meeting the requirements of a wider range of use cases, including the extension of cloud and mobile application integration capabilities via APIs, microservices management, accelerated mobile application development (internal and external developers), and IoT integration.

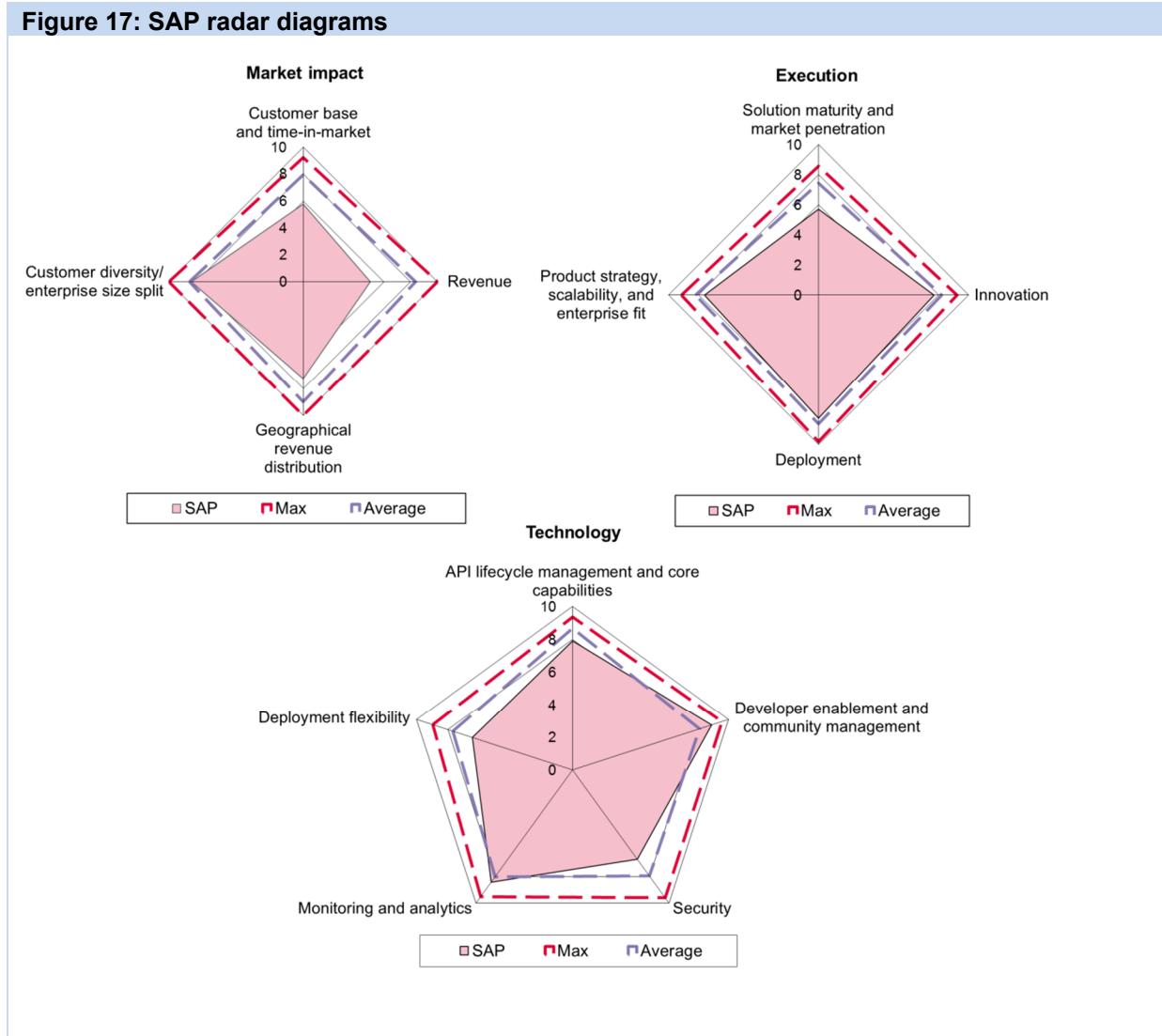
## *Threats*

### **Major middleware vendors with an established API management offering**

Oracle will face significant competition from major middleware vendors with an established API management offering, particularly for opportunities where enterprises are not averse to using a heterogeneous middleware stack and have existing relationships with two or more major middleware vendors.

## SAP (Ovum recommendation: challenger)

**Figure 17: SAP radar diagrams**



Source: Ovum

### Ovum SWOT Assessment

#### Strengths

##### Well suited to API management requirements of existing SAP customers

In July 2014, SAP announced an OEM and reseller agreement with Apigee, under terms of which SAP delivers on-premise API management (with some additions and enhancements) and a cloud-based API management solution built on SAP HANA Cloud Platform. SAP's product strategy for API management revolves around the requirements of existing customers.

While SAP has a good foundation in terms of SOA governance, the API management solution offers far more than fine-grained service governance capabilities. The solution supports easy integration with specific SAP applications and middleware platforms, and SAP is working toward extending this provision to a broader set of products. Both on-premise and cloud-based API management solutions support end-to-end API lifecycle management.

### **Robust developer enablement and community management, and analytics capabilities**

SAP achieved high scores in the “developer enablement and community management” and “monitoring and analytics” criteria groups. SAP’s API management proposition is functionally rich in terms of developer enablement and community management, including rich documentation, portal customizability, and self-enrollment and developer collaboration capabilities. The enterprise edition offers integrated SAP HANA predictive analytics, and API monetization requirements are supported via the SAP Hybris Billing solution.

### **Weaknesses**

#### **Relatively limited security capabilities**

The SAP API management offering provides limited support for common enterprise IAM solutions and specific security standards/protocols. SAP should focus on expanding features and capabilities in this area to better support enterprises in exploiting existing investments in IAM solutions, as well as supporting end-to-end security and comprehensive identity federation. While unified access and orchestration based on open standards such as REST, Odata, SOAP, and OAuth is a good foundation, SAP would benefit from built-in support for other standards, such as public-key cryptography standards (PKCS), OpenID, and JSON web signature (JWS).

#### **More needs to be done in terms of product marketing to improve enterprise mindshare and competitive positioning**

While SAP’s API management proposition continues to evolve at a good pace, there are gaps in the product marketing that need to be filled to increase enterprise mindshare and drive adoption. SAP’s market messaging should clearly identify and emphasize use cases supported by the API management solution when it is used as an extension of SAP integration infrastructure and applications portfolio and the HANA platform. Because SAP’s new API management offering has been in the market for less than two years, dedicated effort and investment are required for improving market visibility and awareness, particularly because aggressive sales and marketing tactics are core characteristics for leading vendors competing in this market segment.

### **Opportunities**

#### **Extension of SAP’s middleware portfolio via API management**

This remains a major opportunity for SAP, which can be further exploited by cross-selling API management to existing SAP applications, integration infrastructure, and HANA platform customers. Initial adoption trends indicate significant success in terms of cross-selling opportunities, and SAP is moving in the right direction by exposing more APIs to developers/integration practitioners.

In light of SAP’s existing customer base, including those using SAP Gateway, there is a huge market opportunity for API management delivered as an extension to SAP’s applications and integration infrastructure portfolio, and this will continue to grow with an increased focus on mobile-centric use cases.

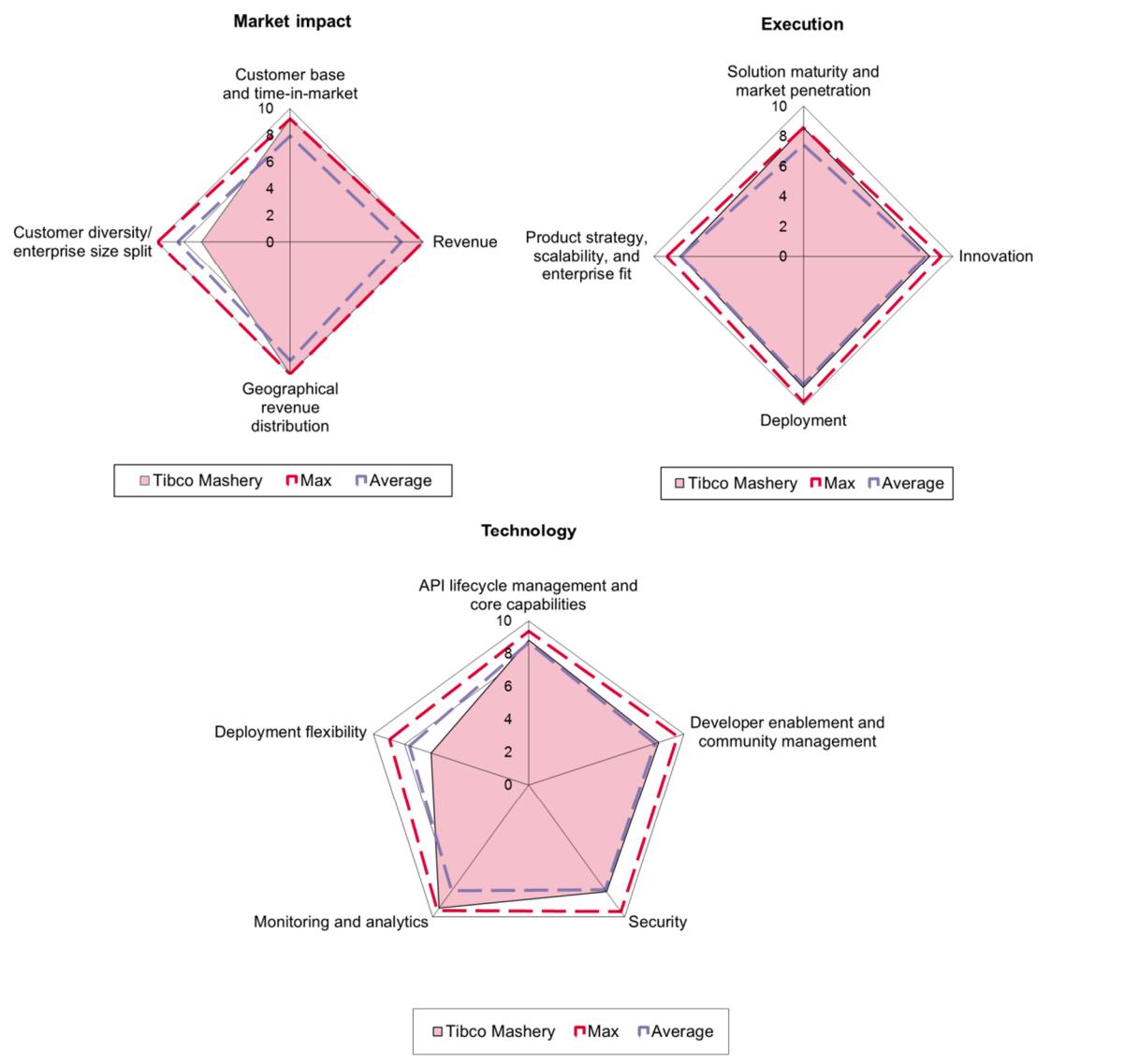
### **Threats**

#### **Middleware vendors with a relatively mature API management offering and specialized API management vendors**

Several middleware vendors have an established API management offering capable of supporting a range of internal and external API management use cases. Some of these vendors have developed competencies to function as a strategic partner for digital business/transformation initiatives, and are not limited to selling a piece of software for meeting API management requirements. SAP will face significant competition from this set of API management vendors. In addition, some specialized API management vendors have extensive experience of supporting a range of API management use cases, including strategic enterprise API initiatives, and can support the federation of their API management solution with middleware platforms provided by other vendors. SAP will face competition from these vendors.

## Tibco Mashery (Ovum recommendation: leader)

**Figure 18: Tibco Mashery radar diagrams**



Source: Ovum

## Ovum SWOT Assessment

### *Strengths*

#### **Tibco is a major middleware vendor and its API management product strategy is evolving at a rapid pace**

Tibco has an extensive and global customer base using its middleware offerings to meet the diverse requirements of on-premise, cloud service, mobile application, and B2B integration use cases. With the rapid rise of digitalization, API management is increasingly used as a tactical solution for supporting agile integration and the extension of existing integration capabilities via APIs. The value proposition of Tibco's middleware stack aligns well with these requirements. Tibco Mashery API management offers robust monitoring and analytics capabilities, and Tibco achieved high scores across the key technology evaluation dimensions, including API lifecycle management and core capabilities, developer enablement and community management, and security.

Tibco's near-term API management product strategy aims to expand toward an "API platform" enabling API creation, productization, and distribution. Integration with Tibco BusinessWorks will allow users to natively publish APIs to Mashery, and Tibco is working toward simplifying the extension of API management capabilities to cloud and mobile integration use cases. A key focus of Tibco's API management product strategy is to offer a single enterprise gateway, with API creation supported via an on-premise Tibco-Mashery API management combination enabling API packaging and distribution under a cloud deployment model. From a broader perspective, Tibco's product strategy is well placed to exploit the market opportunity associated with API-led digital transformation initiatives.

#### **Mashery acquisition has strengthened Tibco's positioning in the API management vendor landscape**

Tibco has benefited from the inclusion and expansion of several key capabilities and Mashery's strong competitive positioning in the "API management as-a-service" market. In particular, Mashery extends comprehensive API lifecycle management and greater ease of use for developers to the combined Tibco-Mashery API management offering. This acquisition has also strengthened Tibco's ability to meet the requirements of several key use cases, including microservices orchestration and management, enterprise API initiatives, and the extension of cloud, mobile, and B2B integration capabilities via APIs. Tibco has an extensive existing middleware customer base and geographical reach outside the Americas, which augurs well for the future of the Tibco Mashery API management offering.

### *Weaknesses*

#### **On-premise API management credentials**

While Mashery has strong credentials as an "API management-as-a-service" vendor, the combined Tibco-Mashery API management offering provides limited capabilities in terms of on-premise API management. Tibco should pay attention to better supporting on-premise API management requirements beyond API traffic management and on-premise security and control.

### *Opportunities*

#### **API management used as an extension of Tibco's middleware stack**

API management is a strategic offering for Tibco, especially in terms of exploiting digital enterprise integration opportunities. Tibco Mashery API management along with other components of Tibco's

middleware stack is capable of meeting a wide range of integration requirements, including API-led tactical integration for digital business initiatives. Tibco can cross-sell API management to existing middleware customers to support digital business initiatives involving the use of APIs. Moreover, Tibco is one of only a few vendors that can support the extension of on-premise, cloud service, mobile application, and B2B integration capabilities via API management.

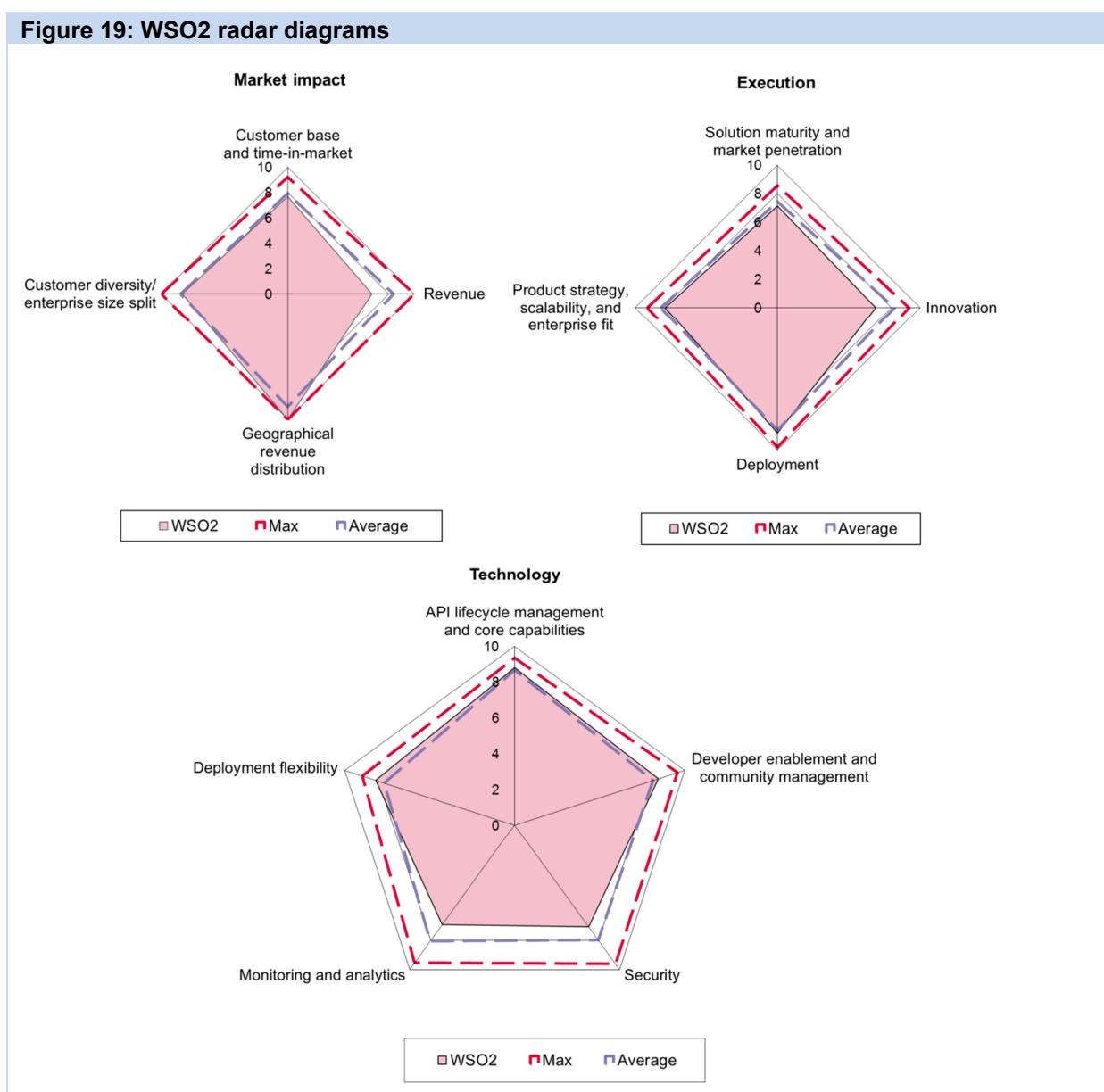
### *Threats*

#### **The API management market and vendor landscape is evolving at a rapid rate**

The astounding rate of evolution on the demand and supply sides of the API management market continues to drive the tactical use of API management as a key enabler for digital business initiatives. Major middleware and specialized API management vendors continue to focus on expanding the features and capabilities of their API management offerings while offering a wider range of options for consuming these capabilities. Increased competition for strategic enterprise initiatives involving the use of APIs is a key characteristic of this market, with API strategy and technical consulting services becoming a critical part of the overall value proposition. Enterprises using heterogeneous middleware stacks, including a combination of on-premise middleware and cloud-based integration services, are likely to undertake a critical evaluation across a range of parameters for selecting an appropriate API management solution. Tibco will face direct competition from major middleware vendors with substantial API management credentials, as well as competing with specialized API management vendors for strategic opportunities where an existing relationship is unlikely to be a decisive factor.

## WSO2 (Ovum recommendation: challenger)

**Figure 19: WSO2 radar diagrams**



Source: Ovum

### Ovum SWOT Assessment

#### Strengths

**A good combination of developer-centric approach to API management and an evolving product strategy**

WSO2 API Manager is an open source solution enabling API discovery, testing, and security, as well as catering for API lifecycle governance and developer community management and engagement requirements. WSO2 offers a predominantly developer-centric approach to API management that builds on a strong SOA governance foundation. The API management solution offers a wide range of capabilities across key API management pillars, such as API lifecycle management and core capabilities and developer enablement and community management, as well as supporting a range of

deployment options. Easy integration/federation with other components of WSO2's middleware stack provides support for a range of "integration + API management" use cases.

As part of an evolving product strategy, WSO2 has expanded the features and capabilities of its API management solution in areas such as role-based access control; centralized governance of APIs, services, and tokens; intuitive user experience, social platform integration, API discovery and subscription, container deployment, and out-of-the-box support for Swagger imports.

### **Optimal solution pricing and effective partner strategy**

It is a relatively low-cost solution, which aligns well with the requirements of enterprises with the in-house skills to exploit open source software capabilities for a range of API management requirements and use cases. WSO2's customer base is evenly split across the Americas, Europe, and Asia-Pacific regions. WSO2 has achieved significant success in driving business growth, especially via partner networks, an area which itself has grown at a rapid rate to expand the company's reach across the globe.

### **Weaknesses**

#### **Monitoring and analytics capabilities**

In the context of monitoring and analytics, WSO2 should focus on expanding/adding capabilities in areas such as less-technical user enablement and custom reports, the automation of analytics functions, and security compliance monitoring. It is worth noting that this is a focus area for product development and in the near term WSO2 plans to expand its analytics capabilities in areas such as richer analytics on API consumption, realtime trend analysis, and alerts for tier breaches.

While there is no major gap in terms of API/service security capabilities, WSO2 would benefit from pre-built support for a range of common enterprise IAM solutions and enforcement of authorization policies at the network edge. It has already made some progress in this regard.

#### **Limited marketing activities**

In comparison to some of its competitors, WSO2 engages in relatively limited marketing activities, which hinders improvement in terms of its brand recognition and competitive market positioning, especially in regions where WSO2 does not have a significant direct presence. WSO2's marketing activities have a technology-centric flavor, which may not resonate with users/decision-makers interested in following a combination of developer and business-centric approaches to API management and adjacent integration use cases. This could be largely attributed to WSO2's strategy as a middleware vendor that chiefly targets enterprise/integration/solution architects and hands-on technologists.

### **Opportunities**

#### **Microservices-centric and IoT initiatives**

WSO2 is well placed to support microservices orchestration and management use cases, and the integration and API management requirements of IoT initiatives with the existing and upcoming capabilities of its broader middleware stack, and these two emerging API management use cases represent a good market opportunity.

### **Threats**

#### **Middleware vendors with a digital transformation-centric strategy**

Several middleware vendors have strong credentials in supporting integration and API management use cases, and some have developed significant capabilities in strategy consulting services aimed at digital business/transformation initiatives. With a predominantly developer/technology-centric approach to API management and integration in general, WSO2 will face significant competition from these vendors for digital business/transformation initiatives involving the use of APIs.

## Methodology

An invitation followed by the ODM evaluation criteria spreadsheet comprising questions across three evaluation dimensions were sent to all vendors meeting the inclusion criteria, with all of these vendors opting to participate. Ovum had thorough briefings with the final 12 vendors to discuss and validate their responses to the ODM questionnaire and understand latest product developments, strategies, and roadmaps.

This ODM includes observations/inputs from Ovum's conversations (including those conducted based on customer references) with IT leaders, enterprise architects, digital transformation initiative leaders, and enterprise developers and integration practitioners using API management solutions.

## Technology assessment

Ovum identified features and capabilities that would differentiate between leading API management solutions. The criteria groups and associated percentage weightings are as follows:

### **API lifecycle management and core capabilities** (weighting assigned =18%)

- end-to-end governance across the entire API lifecycle
- one-click deployment to API gateway for instant publishing
- routing based on message content, headers, and identity
- capability to send alerts and notifications to subscribers when APIs are versioned
- automation of API migration process across different environments
- reuse of existing API definitions via import of Swagger representation
- an extensive library of pre-built policy rules
- capability to revert to the previous versions of an API in runtime, with little or no disruption to consumers
- capability to send alerts and notifications to subscribers in case of occurrence of an API lifecycle event
- support for API deprecation and retirement
- automated fail over for high availability and reliability
- support for bi-directional transformations:
  - REST-to-simple object access protocol (SOAP)
  - Extensible markup language (XML)-to-JSON
  - Hypertext transfer protocol (HTTP)-to- Java Message Service (JMS)
  - JavaScript object notation (JSON)-to-CSV

- mediation with IoT protocols, such as *message queuing telemetry transport* (MQTT) and constrained application protocol (CoAP)
- support for aggregation of data from various sources, such as internal backend APIs and third-party applications
- support for traffic prioritization in case of resource limitations and/or higher latency
- addition/removal of policies at runtime without impacting API availability/performance
- pre-built integration to common SaaS applications
- a tool and/or a SDK for developing new connectors
- easy integration with SOA and traditional integration infrastructure

#### **Developer enablement and community management** (weighting assigned = 24%)

- API developer portal
- support for a "zero-coding" or configuration-based approach for designing APIs
- support for self-registration and approval workflows
- single sign-on via different social platforms
- an API catalog to simplify API publishing, promotion, discovery, and consumption
- provision for setting up of private forums for discussions about specific development initiatives
- developer self-enrollment to appropriate API service tiers based on expected usage
- support for building a developer portal based on an external/third-party content management system (for example, Drupal)
- "invitation only" developer onboarding
- support for customization of branding, look, and feel of the API developer portal
- support for cloning of an API
- a tool for unit testing of APIs
- a tool for performance and load testing of APIs
- interactive tools to test APIs without writing code
- comprehensive API search capabilities, including Simple keyword and Model- or meta-data based search
- backend-as-a-service (BaaS) capability to enable developers to build and scale applications using data services (for example, geo-location, push notifications, and cloud-based scalable datastore)
- Ability to provision API access individually to each application
- collaboration venue that developers can use to contribute, discuss and provide feedback
- interactive documentation on how to use APIs
- support for moving and sharing an API configuration across different environments and tenants

#### **Security** (weighting assigned =21%)

- pre-built integration with common IAM systems/standards:
  - Lightweight directory access protocol (LDAP)

- IBM Tivoli access manager
- CA SiteMinder
- Oracle Access Manager
- EMC/RSA IMG platform
- Dell/Quest IAM
- Microsoft Active Directory
- OAuth 2.0 identity federation
- support for XACML specification for fine-grained access control
- support a range of API security mechanisms, including:
  - API key-based authentication
  - OAuth access tokens
  - Policy-based access control
  - Rate limiting
  - Two-way TLS authentication
- support for a range of security protocols/standards, including:
  - Security assertion markup language (SAML) 2.0
  - WS-Security
  - Kerberos
  - Public-key cryptography standards (PKCS)
  - JSON web signature (JWS)
  - Simple cloud identity management (SCIM 1.0)
  - OpenID
  - ECC digital certificates
- provision for an administrator to restrict user access to specific API operations
- capability to allow/ restrict application access to specific API operations
- support for multi-factor authentication schemes
- capability to hide specific/sensitive information in message body
- provision to allow users to enforce authorization policies at the network edge
- centralized management and secure storage for API keys, tokens, and other security artifacts
- proxying of mobile streaming protocols, for example, WebSocket and extensible messaging and presence protocol (XMPP)
- automatic blocking of requests from specific regions/locations
- audit trail of all service interactions
- message validation, including XML and JSON schema validation

#### **Monitoring and analytics** (weighting assigned =25%)

- dashboard for tracking key metrics, including
  - Top developers

- Top applications
- Number of calls per API
- Response time (Max./Min./average)
- Request methods (such as GET, POST, DELETE, and PUT)
- Bandwidth usage
- Errors
- Peak load
- support for third-party analytics solutions such as Google Analytics and Splunk
- support for realtime reporting and analytics
- support for creation of custom reports as per user role (for example, developers, business owners, administrators) and needs
- performance monitoring reports on key metrics, including
  - Latency
  - Service-level agreement (SLA) compliance
  - Transaction rate and time
  - Availability
- reports covering details on compliance of security policies
- built-in predictive analytics capability
- API monetization tools supporting subscription plans, automated invoice, and billing
- an "easy-to-use" user interface (UI) to allow business/less technical users to create/update rate plans, managing limits, and notifications
- REST API to automate specific analytics functions
- provision for setting up of alerts/notifications to be sent to users when they have consumed a major share (above a certain threshold) of their quota
- easy integration with common log and system management tools

#### **Deployment flexibility** (weighting assigned =12%)

- deployment options: on-premise, private cloud, public cloud, appliance, and hybrid deployment
- support for seamless transition between SaaS and on-premise API management, including the ability to transfer API artifacts between the two versions
- delivery of API management "as a service" via a regional/nearby data center
- flexibility to switch between different infrastructure-as-a-service (IaaS) providers
- provision for running the solution on open source PaaS offerings, such as Cloud Foundry and Apache Stratos
- support for deployment on software containers

## Execution assessment

In this dimension, Ovum assessed the capability of an API management solution across the following key areas:

**Solution maturity and market penetration** (weighting assigned =12%): identifying the maturity of solution in its current state and the extent to which it has penetrated the market for this class of middleware solutions.

**Innovation** (weighting assigned =10%): identifying innovation in key areas, such as product strategy, architecture, and commercial model and assessing the value delivered to enterprise users.

**Deployment** (weighting assigned =10%): assessment criteria and points of information related to various deployment aspects, including professional services for supporting large-scale implementations, strategy and technical consulting services, and types of SLAs and SLA compliance.

**Product strategy, scalability, and enterprise fit** (weighting assigned =68%): assessing the product strategy and scalability of an API management solution, alignment with mainstream IT architectures and roadmaps, and applicability to a range of key API management use cases.

## Market impact assessment

Market impact was assessed on the basis of scores obtained against four criteria groups: customer base and time-in-market, revenue, geographical revenue distribution, and customer diversity/enterprise size split. The first two criteria groups were assigned weighting of 60% and 30% respectively. While the other evaluation criteria groups (geographical revenue distribution and customer diversity/ enterprise size split) were assigned minimal weighting (5% each), the corresponding figures offer useful insight via market impact radar diagrams.

## Appendix

### Further reading

*2016 Trends to Watch: Integration and Middleware*, IT0022-000566 (December 2015)

*API Management: Exploiting and Governing APIs to Achieve Digital Transformation*, IT0022-000023 (April 2014)

*Realizing the Business Value of APIs*, IT0022-000199 (October 2014)

*Using API management to simplify microservice orchestration and management*, IT0022-000479 (October 2015)

*Framework: API Management versus SOA Governance*, IT0022-000149 (August 2014)

*Framework: Evaluation Criteria For Selecting an API Management Solution*, IT0022-000464 (September 2015)

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## Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at [consulting@ovum.com](mailto:consulting@ovum.com).

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