

# The Forrester Wave™: Geospatial Analytics Tools And Platforms, Q3 2016

The Six Providers That Matter Most And How They Stack Up

by Rowan Curran

August 31, 2016

## Why Read This Report

Mobile handsets and embedded software in IoT devices are causing a proliferation in the sources and speed for capturing location. Location awareness is just the first step, and today top companies are analyzing and acting on spatial data to drive differentiation across enterprises: from sales to product to support and more. In our 38-criteria evaluation of spatial analysis platform vendors, we identified the six most significant ones — Alteryx, Esri, MapLarge, Oracle, Pitney Bowes, and SAP — to help AD&D professionals and their peers to select the right solution for their company.

## Key Takeaways

### **Esri, Oracle, And Pitney Bowes Lead The Pack**

Forrester's research uncovered a market in which Esri, Oracle, and Pitney Bowes lead the pack. SAP, Alteryx, and MapLarge offer competitive options.

### **AD&D Pros Want To Operationalize Spatial Analysis Across Their Company**

The geospatial analysis market is growing because more AD&D professionals see spatial data and location intelligence as a way to address their top challenges. This market growth is due in large part to AD&D pros' increasing need for spatial insights to drive accurate and differentiated decisions.

### **Scalability, Ease Of Use, And Insights Delivery Are Key Differentiators**

As geospatial analysis moves out of geographic information systems (GIS) teams and begins to inform the organization more broadly with its insights, the key differentiators are changing from years past. Accuracy of insight is critical, but just as important are the platform's capabilities to scale to large data sets, easy-to-use interfaces for business analysts and application developers, and methods for delivering insights.

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August 31, 2016

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### Notes & Resources

Forrester conducted product evaluations in June and July 2016 and interviewed 23 vendor and user companies, including the top six vendors featured in this report: Alteryx, Esri, MapLarge, Oracle, Pitney Bowes, and SAP.

### Related Research Documents

[Q&A: Locate Answers To Five Key Spatial Analytics Questions](#)

[TechRadar™: Spatial Data And Location Intelligence, Q1 2016](#)

[Vendor Landscape: Spatial Analysis And Location Intelligence, Q2 2016](#)

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## The Market Changes From GIS To Spatial Analysis Platforms

Spatial analysis, like many areas of analytics, has traditionally been the purview of specialists with domain expertise in the mathematics and theory of map-making and geospatial information. The tools they used were too esoteric for much of the organization, and cycles of insight production were slow. Today, a transformation has taken hold in the industry, and the creation and use of spatial insights is rapidly spreading across the enterprise. Spatial insights are finding their way into sales, customer relationship management (CRM), customer support, human resources, marketing, technology management, and many other areas. Crucial to this trend is the fact that these teams are not just consuming spatial insights provided by specialist teams; often they are customizing or generating their own.

### The Mobile Mind Shift Transformed Location Data — The IoT Will Revolutionize It

GIS enjoyed a prominent but sleepy role for many years: In some industries it was critical and in others it was not even considered. Today, advancements and innovations are driving a new wave of interest in location solutions. These allow companies to use spatial data to drive unprecedented levels of understanding and analysis of users' habits and behavior, but they also provide the platforms to deliver the messaging, content, and other actions directly to users in the most appropriate context. Some of the most important trends to application development and delivery (AD&D) pros at enterprises looking to capture value from location data are the:

- › **Ever-expanding arrays of sensors to collect location data.**<sup>1</sup> As the variety of channels and devices that connect customers, companies, and physical assets increases, so too do the ways to measure and analyze spatial information. GPS, IP address, RFID, Wi-Fi, Bluetooth low energy (BLE), and VLC are just a few of the sources for spatial information.<sup>2</sup> The internet of things (IoT) presents a massive opportunity for companies to uncover insights from spatial relationships, as every connected device can be located by some means.
- › **New software architectures to ingest, store, and analyze this data.**<sup>3</sup> Scalability and processing are now at the fingertips of every company, thanks to the advent of cloud economics combined with advances in distributed processing and storage to allow deeper analysis across wider sets of data than ever before. Traditional desktop deployment and single-threaded processing architectures that traditionally dominated GIS tools are not sufficient to analyze web-scale data, much less the rushing flood of data from the IoT that is bearing down on enterprises.
- › **Vendor-provided data sets and location intelligence.**<sup>4</sup> One of the great challenges for effectively making use of location data has been integrating it with other data sets and analysis to provide deeper context and insight. Companies providing basemaps, background data, and so on are growing, as are folks directly delivering insights using spatial information.

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**Spatial Analysis Platforms Are Just The Tip Of The Location Intelligence Iceberg**

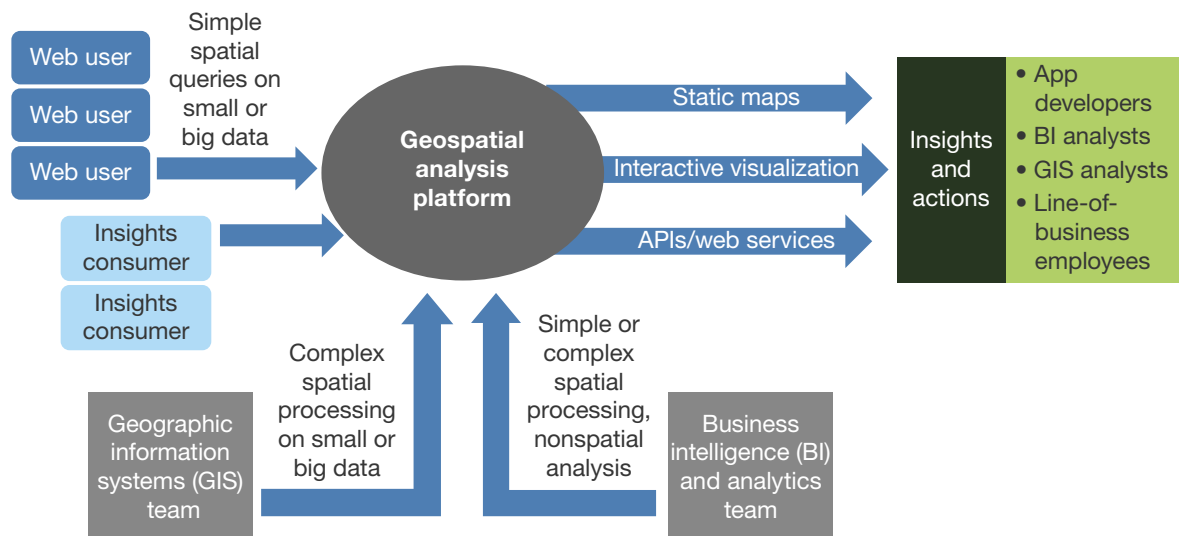
New ways of accessing location insights mean that GIS pros, data scientists, app developers, and their line-of-business colleagues all have a conduit from data discovery to insights and to action (see Figure 1). While the platforms assessed here can all be applied to the broad data and application challenges below, dedicated vendors have arisen for specific spatial use cases and verticals. Some are even built upon the vendor technologies assessed in this Forrester Wave. In addition to the dedicated GIS tools and advanced analytics platforms, AD&D pros looking to uncover insights using location data can leverage:

- › **BI platforms with embedded or integrated spatial capabilities.** Business intelligence (BI) tools have not been equipped to allow users access to the insights that a spatial context provides, and even today the native capabilities of many vendors are still limited. Companies like GoodData, Microsoft, SpagoBI, and Yellowfin allow users to take data sets with addresses or GPS coordinates and display them on a map, but only through simple layers and clusters. This highlights a key difference between spatial analysis vendors and BI vendors: The former offer advanced algorithmic analysis of spatial data, while the latter are often limited to querying, drilling, and visualizing. For the more advanced spatial analytics, many vendors such as IBM Cognos, Information Builders, MicroStrategy, and Panorama Technologies have integrated with vendors of dedicated spatial analytics or other advanced analytics platforms to surface spatial insights to users.
- › **Spatial infrastructure and software providers.** The advent of ubiquitous mobile devices has ushered in a new wave of hardware and software tools to capture the value of the location where most of us spend the majority of our time: indoors. Accurately and consistently capturing and acting on indoor location information usually requires infrastructure in the form of Wi-Fi, BLE, or RFID. Cutting-edge vendors are also using sources like LEDs and magnetometry. Providers of this hardware are increasingly becoming the purveyors of the software to turn location information into business value, ranging from basic mapping and monitoring of users within a space to more detailed analytics about footfall, dwell-time, and proximity.
- › **Location intelligence applications and services.** In some cases, the insights and actions derived from spatial data no longer require any infrastructure at all. Developers can address use cases such as geocoding, geofencing, geosearch, drive-time analysis, directions, customer targeting, and many others by using a variety of API services. Advanced location intelligence providers include Here and LocationSmart, and location data and intelligence companies include Factual or PlacelQ. Developers who have limited experience with spatial data can integrate these services into their applications and business processes. Many of the vendors in this Forrester Wave also provide location data and intelligence in addition to their core spatial data processing and analysis capabilities.
- › **Open source analysis tools and data sets.** At present, open source has a unique role in the geospatial analysis landscape. While there are ever-growing sets of options for both spatial processing (e.g., QGIS, Boundless Spatial) and visualizing spatial data (e.g., OpenStreetMap Foundation), enterprises are finding that current open source projects aren't able to cope with the demands for enterprise deployments. These can serve smaller insights projects and application

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deployments, but once the depth and scale of analysis reach the complexity needed for use cases such as oil exploration or telecom network analysis, they often can't meet the demand for speed and accuracy.

**FIGURE 1** Wide User Bases Mean Vendors Must Meet New Scales Of Insight Creation And Action Delivery

## Spatial Analysis Platforms Evaluation Overview

To assess the state of the spatial analysis platform market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of the top six spatial analysis platform vendors. After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of 38 evaluation criteria, which we grouped into three high-level buckets:

- › **Current offering.** Vendors' current offerings include architecture, analysis, and capabilities to serve a broad range of users as well as prebuild solutions for horizontal and vertical uses.
- › **Strategy.** We assessed each vendor's strategy for pricing and acquisition, company and product road map, and ability to support implementation.
- › **Market presence.** We assessed each vendor's relative placement in the market, including customer numbers, revenue, and partners.

## Evaluated Vendors And Inclusion Criteria

Forrester included six vendors in the assessment: Alteryx, Esri, MapLarge, Oracle, Pitney Bowes, and SAP. To be included in this evaluation, each of these vendors must (see Figure 2):

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- › Have a minimum annual revenue of \$10 million USD for its geospatial analysis solutions.
- › Have at least 10 enterprise customers or 10,000 end users.
- › Be able to ingest, model, and analyze data with geospatial algorithms and models.
- › Provide capabilities for handling Wi-Fi, BLE, and GPS data.
- › Be able to translate the insights into business action through APIs, published maps, exported models, and others.

**FIGURE 2** Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product evaluated	Product version evaluated
Alteryx	Alteryx Designer, Alteryx Server, and Alteryx Analytics Gallery	10.5
Esri	ArcGIS	10.4
MapLarge	MapLarge Mapping Engine	4.5
Oracle	Oracle Spatial	12c
Pitney Bowes	Pitney Bowes Location Intelligence Suite, Spectrum Technology Platform	N/A (individual products within the suite have various version numbers)
SAP	SAP Hana Platform, SAP Data Services, SAP BusinessObjects Lumira, and SAP BusinessObjects Cloud	SAP Hana SPS 12 SAP Data Services 4.2 SAP BusinessObjects Lumira 1.30 SAP BusinessObjects Cloud 2016.16

**Vendor selection criteria**

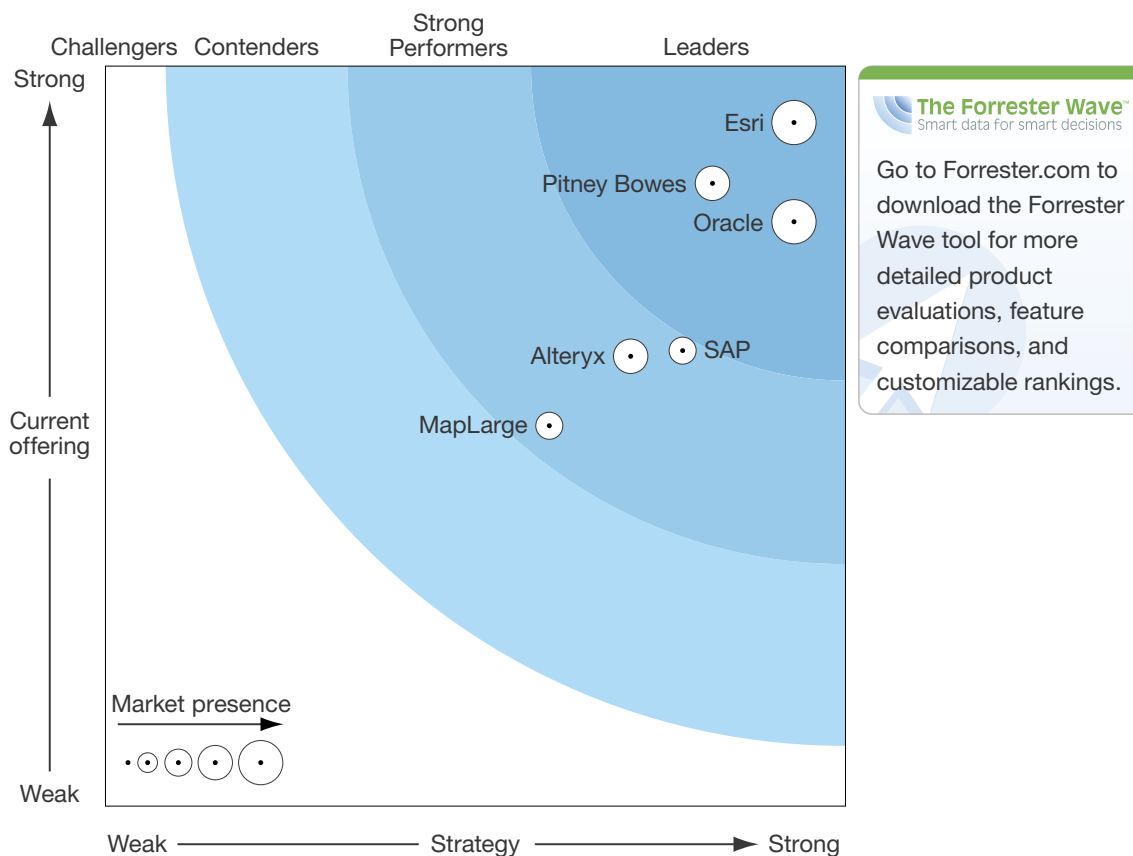
1. **Vendor revenue.** The vendor must have had more than \$10 million revenue for the geospatial analysis solution in 2015.
2. **Customer base.** The vendor has at least 10 enterprise customers or 10,000 end users.
3. **Complete platform for spatial analysis.** The vendor provides capabilities to ingest, model, and analyze data with geospatial algorithms and models.
4. **Indoor/outdoor.** The vendor must provide capabilities for handling Wi-Fi, Bluetooth low energy (BLE), and GPS data.
5. **Insights to action.** The vendor must be able to translate the insights into business action through APIs, published maps, exported models, and so on.

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## Vendor Profiles

This evaluation of the geospatial analytics platforms market is intended to be a starting point only. We encourage clients to view the detailed product evaluations and adapt the criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool (see Figure 3).

**FIGURE 3** The Forrester Wave™: Geospatial Analytics Tools And Platforms, Q3 '16

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**FIGURE 3** The Forrester Wave™: Geospatial Analytics Tools And Platforms, Q3 '16 (Cont.)

	Forrester's Weighting	Alteryx	Esri	MapLarge	Oracle	Pitney Bowes	SAP
CURRENT OFFERING	50%	3.04	4.62	2.57	3.95	4.21	3.08
Architecture	10%	3.00	3.50	4.60	5.00	3.60	4.40
Operational management	5%	3.00	5.00	3.00	5.00	3.00	5.00
Data sources and preparation	15%	3.90	4.70	2.70	4.25	5.00	4.40
Security	5%	5.00	5.00	3.00	5.00	5.00	5.00
Spatial insights	40%	2.37	4.64	2.42	3.51	4.33	2.09
Application development	20%	3.30	4.80	1.95	3.80	4.10	3.00
Business applications	5%	3.00	5.00	1.00	3.00	3.00	1.00
STRATEGY	50%	3.55	4.65	3.00	4.65	4.10	3.90
Acquisition and pricing	20%	3.00	5.00	2.00	5.00	5.00	3.50
Solution road map	35%	3.00	4.00	3.00	4.00	4.00	3.00
Ability to execute	35%	4.00	5.00	3.00	5.00	4.00	5.00
Implementation support	10%	5.00	5.00	5.00	5.00	3.00	4.00
MARKET PRESENCE	0%	3.18	5.00	2.93	4.48	3.79	2.73
Vendor sizing	70%	2.40	5.00	2.90	4.25	3.70	1.75
ISV and services partners	30%	5.00	5.00	3.00	5.00	4.00	5.00

All scores are based on a scale of 0 (weak) to 5 (strong).

**Leaders**

- › **Esri is an authoritative standard for GIS and continues to innovate.** Esri's consistent and constant focus on serving the GIS market for decades has matured into a platform with some of the most extensive capabilities for capturing spatial data and the analysis, presentation, and delivery of spatial insights. Esri's strong capabilities in 3D mapping and projections as well as its comprehensive Living Atlas of spatial enrichment data provide a wealth of components for deep analysis. Nonspecialists can easily consume Esri's insights as well, through applications or through its ArcGIS Online software-as-a-service (SaaS) platform.
- › **Oracle powers spatial decisions that demand big data.** Oracle's strong history in the database market was brought to bear on the geospatial market, and the result is a powerful platform for enabling enterprises to execute complex spatial analysis and build demanding spatial applications at scale. While hardcore GIS professionals may start their work in other applications, when they want to solve spatial problems in production and with web- and IoT-scale data, Oracle gives them the platform to do so. Spatial and graph are built on the Oracle kernel, and customers are delighted with its built-in security, performance, and optimization for their spatial analysis.



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- › **Pitney Bowes delivers a scalable spatial solution connected for commerce.** Pitney Bowes offers a scalable spatial platform that GIS professionals require, but the vendor also helps many other users of geospatial technology and data accelerate adoption by leveraging the power of its Spectrum Technology Platform and enabling its wider software solutions with spatial capabilities. Its solution focuses on scalable analysis, fast and accurate geocoding (with additional contextual data delivered via the GeoEnrichment capability), and an increasing empowerment of developers through web-based APIs for infusing applications with additional spatial data and location intelligence, such as local geosearch and supporting data solutions.

**Strong Performers**

- › **SAP embraces the spatial market with Hana to deliver geo-enabled applications.** Hana, an enterprise-class in-memory computing platform that allows users to execute spatial analytics at large scale, is another step in SAP's vision to deliver a wide range of advanced analytics — geospatial, predictive, text and search, time-series, and more — to enterprise applications in a single platform. In addition to Hana's capabilities in high-volume processing, SAP offers a geospatial analysis framework to allow developers and GIS analysts alike to embed spatial insights into their workflows. SAP's focus on tight integration with the wider BusinessObjects suite enables easy leveraging of spatial insights into a range of applications.
- › **Alteryx puts the power of spatial into the hands of every analyst.** With its origins in spatial data blending, Alteryx sees success as a data integration, preparation, and analytics tool. Serving data scientists, location intelligence analysts, and line-of-business employees, Alteryx's tool has a reputation for user friendliness in addition to its powerful analytical capabilities. Alteryx users can easily combine their analysis of spatial data within workflows that demand other statistical or predictive modeling.
- › **MapLarge turbocharges spatial processing for high-end enterprises.** MapLarge delivers a geospatial analysis platform with great capacity for scalability but with a particular focus on enterprises that have demanding requirements in security and resilience for mission-critical deployments. While MapLarge is one of the few vendors in this Forrester Wave without ACID-compliant SQL, this choice lets it focus on the efficient use of low-level caching to speed delivery of insights to end users. MapLarge is in use at some of the most demanding government agencies, delivering speedy and accurate spatial insights.

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## Supplemental Material

### Online Resource

The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

### Data Sources Used In This Forrester Wave

Forrester used a combination of four data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by June 22, 2016.

- › **Hands-on lab evaluations.** Vendors spent one day with a team of analysts who performed a hands-on evaluation of the product using a scenario-based testing methodology. We evaluated each product using the same scenario(s), creating a level playing field by evaluating every product on the same criteria.

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- › **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.
- › **Product demos.** We asked vendors to conduct demonstrations of their products' functionality. We used findings from these product demos to validate details of each vendor's product capabilities.
- › **Customer surveys and reference calls.** To validate product and vendor qualifications, Forrester also conducted reference calls with three of each vendor's current customers.

### The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on 1) product fit, 2) customer success, and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave evaluation — and then score the vendors based on a clearly defined scale. We intend these default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. For more information on the methodology that every Forrester Wave follows, go to <http://www.forrester.com/marketing/policies/forrester-wave-methodology.html>.

### Integrity Policy

We conduct all our research, including Forrester Wave evaluations, in accordance with our Integrity Policy. For more information, go to <http://www.forrester.com/marketing/policies/integrity-policy.html>.

### Endnotes

- <sup>1</sup> A cornucopia of technologies exists to collect, analyze, and act on spatial data, and the landscape is still evolving quickly. For more information on these different technologies and to learn more about their maturity, business value, and use cases — see the “[TechRadar™: Spatial Data And Location Intelligence, Q1 2016](#)” Forrester report and see the “[TechRadar™: Internet Of Things, Q1 2016](#)” Forrester report.

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<sup>2</sup> GPS = global positioning system. RFID = radio frequency identification.

<sup>3</sup> Streaming analytics is essential for bringing real-time context to apps, and most AD&D pros aren't fully exploiting real-time streaming data that flows from IoT devices and mobile, web, and enterprise apps. For more information on the leading vendors in this market, see the "[The Forrester Wave™: Big Data Predictive Analytics Solutions, Q2 2015](#)" Forrester report and see the "[The Forrester Wave™: Big Data Streaming Analytics, Q1 2016](#)" Forrester report.

<sup>4</sup> Insights service providers include smaller, specialized boutique providers, large business and IT services companies, as well as the data and analytics software providers themselves. To better understand this landscape, see the "[Vendor Landscape: Insights Service Providers](#)" Forrester report.

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