

# The Forrester Wave™: Enterprise Data Warehouse, Q4 2015

The 10 Providers That Matter Most And How They Stack Up

by Noel Yuhanna  
December 7, 2015

## Why Read This Report

In the era of big data, enterprise data warehouse (EDW) technology continues to evolve as vendors focus on innovation and advanced features around in-memory, compression, security, and tighter integration with Hadoop, NoSQL, and cloud. Forrester identified the 10 most significant EDW software and services providers — Actian, Amazon Web Services (AWS), Hewlett Packard Enterprise (HPE), IBM, Microsoft, Oracle, Pivotal Software, SAP, Snowflake Computing, and Teradata — in the category and researched, analyzed, and scored them. This report details our findings about how well each vendor fulfills our criteria and where they stand in relation to each other to help enterprise architect professionals select the right solution to support their data warehouse platform.

## Key Takeaways

### **Oracle, Teradata, IBM, SAP, AWS, And Microsoft Lead The Pack**

Forrester's research uncovered a market in which Oracle, Teradata, IBM, SAP, Amazon Web Services, and Microsoft lead the pack. Pivotal Software, Hewlett Packard Enterprise, Actian, and Snowflake Computing offer competitive options.

### **EDW Evolves Beyond Traditional Storage And Delivery**

The EDW market continues to evolve as enterprise architecture pros recognize that improved scalability, better performance, and deeper integration with Hadoop and NoSQL platforms will address their top challenges. Many EDW vendors are now offering tighter integration with dynamic random-access memory (DRAM), Flash, solid-state drive (SSD), and some distributed in-memory that spans across multinodes in a cluster to process larger amounts of data to support real-time analytics.

### **Scale, Performance, And Innovation Distinguish The EDW Leaders**

The Leaders we identified offer credible, high-performance, scalable, secure, flexible, and robust EDW solutions. Our Strong Performers have turned up the heat as high as it will go on the incumbents, with innovations that many customers find compelling.

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### Notes & Resources

Forrester conducted product evaluations in October 2015 and interviewed 10 vendor and user companies: Actian, Amazon Web Services (AWS), Hewlett Packard Enterprise (HPE), IBM, Microsoft, Oracle, Pivotal Software, SAP, Snowflake Computing, and Teradata.

### Related Research Documents

- [Market Overview: In-Memory Data Platforms](#)
- [The Forrester Wave™: Enterprise Data Virtualization, Q1 2015](#)

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## EDW Frameworks Continue To Evolve To Support New Use Cases

Today, organizations still rely on EDW platforms to deliver actionable, timely, and trustworthy intelligence. EDW technology organizes and aggregates analytical data from various functional domains and serves as a critical repository for organizations' operations. It offers in-database analytics, predictive models, and embedded business algorithms to drive business decisions. EDW is a robust, secure, and proven ecosystem that supports integration with data models and security frameworks, real-time analytics, automation, and a broad range of business intelligence (BI) and visualization tools. It is the foundation for BI to support timely reports, ad hoc queries, and dashboards and to supply other analytics applications with trusted and integrated data. Most organizations that have a data warehouse (DW) are either enhancing it or considering new business initiatives that require faster processing and larger storage requirements. EDW is delivering new use cases that include real-time analytics, operational intelligence, customer analytics to deliver improved customer experience, and Internet of Things (IoT) analytics to improve operational efficiency.

### Next-Generation EDW Technology Focuses On Real-Time, Automation, And Integration

EDW vendors continue to deliver innovative features to support new and growing data requirements. Next-generation EDW technology continues to expand to support extreme scale and performance, provide richer integration and a higher degree of automation, and support real-time analytics. Recent EDW innovations and feature enhancements have been in the areas of:

- › **Integrating with in-memory architectures to support real-time analytics.** Until recently, using a large memory platform was not an option, because memory was expensive. Today, EDW vendors have started to offer more-scalable platforms that use distributed memory in a clustered configuration and integrate with solid-state drives (SSDs) seamlessly to process large amounts of data quickly. These options deliver real-time analytics and predictive analytics that are essential for businesses.
- › **Integrating with Hadoop to support larger ingestion and transformation.** Many EDW vendors now offer the ability to integrate their solutions with Hadoop to store, process, and transform large amounts of structured and unstructured data. Forrester sees many enterprises already using an extract-Hadoop-load (EHL) approach to extract data from various source systems, such as IoT devices and cloud and traditional platforms, then load it into Hadoop, perform aggregation and transformation, and finally load it into the EDW to support business analytics. Why EDW? Because of its maturity around governance, security, integration and quality, which still remains a weak spot for Hadoop.
- › **Leveraging native data compression capabilities.** With growing data volumes, larger, petabyte-scaled data warehouses have started to emerge, creating administrative challenges. Vendors are now offering advanced data compression capabilities that can dramatically reduce EDW sizes by 60% to 90%, cutting down cost and administration requirements. Some vendors are starting to offer chip-level hardware compression that minimizes system overhead and offer extreme levels of compression.

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- › **Leveraging data virtualization to simplify integration.** Data virtualization integrates disparate data sources in real time or near-real time to support analytics, predictive analytics, customer personalization, and real-time integrated analytics. With EDW solutions, data virtualization offers the ability to transform, cleanse, and integrate various sources before loading into an EDW platform. Leading vendors supporting data virtualization solutions include Composite Software, Denodo Technologies, IBM, Informatica, Microsoft, Oracle, Red Hat, and SAP.
- › **Enabling in-database analytics to process complex functions.** EDW platforms support application integration scenarios through features and interfaces such as MapReduce, in-database function pushdown, embedded statistical algorithm libraries, predictive modeling integration, decision automation, and mixed workload management.

**Enterprises Have More Choices When It Comes To Deployment Strategy**

EDW appliances have been gaining significant momentum, thanks to their stronger integration of hardware and software, improved automation, single-vendor support, higher performance and scale, and reasonable prices. These advances now allow companies to use the platforms for new and emerging use cases such as IoT insights, real-time analytics, fraud detection, 360-degree view of customer, and predictive analytics. Top EDW vendors offer enterprise-grade, appliance-based EDW solutions, either directly or through hardware partners. Leading EDW appliance vendors include Hewlett Packard Enterprise, IBM, Microsoft, Oracle, Pivotal Software, SAP, and Teradata. In addition, thousands of enterprises are deploying data-warehouse-as-a-service (DWaaS) to support new use cases such as customer analytics. EDW solutions are available in four categories:

- › **Traditional DBMS product enhancements that support mixed workloads.** Traditional, general-purpose database management system (DBMS) software vendors like IBM, Microsoft, Oracle, and SAP have extended their database products over the years to support enterprise-grade EDW requirements. Using common DBMS software for transactional and analytics can reduce data movement and processing requirements.
- › **Specialized EDW software that delivers an analytical stack.** This category includes EDW software optimized for analytics workloads, such as columnar-optimized EDW solutions and in-memory analytics processing engines. Vendors like Actian, Pivotal Software, and Teradata have created specialized EDW software to support large, complex data sets.
- › **EDW appliances that optimize software and hardware integration.** Vendors like Hewlett Packard Enterprise, IBM, Microsoft, Oracle, Pivotal Software, SAP, and Teradata offer EDW appliances that optimize servers, storage, memory, and software to deliver faster analytics and predictive analytics. They also automate the administration, tuning, and scaling of DWs.
- › **DWaaS that offers faster time-to-value and low-cost alternatives.** These new public cloud offerings deliver low-cost alternatives to on-premises EDW solutions, automating provisioning, configuration, security, tuning, optimization, scalability, availability, and backup. Vendors offering DWaaS include Amazon Web Services, IBM, Microsoft, Oracle, SAP, Snowflake Computing, and Teradata.

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## Enterprise Data Warehouse Evaluation Overview

To assess the state of the EDW market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top EDW vendors. The EDW market is extremely competitive because it has become a critical category in data management, with leading pure-play EDW vendors and big data vendors gunning for a piece of the data management market. Customers will benefit as the pace of innovation increases and the costs of memory and SSD further decline to support petabyte-scaled environments.

### Our Evaluation Focuses On Scale, Performance, Administration, And Use Cases

After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 31 criteria, which we grouped into three high-level buckets:

- › **Current offering.** To assess the breadth and depth of each vendor's EDW product set, we evaluated each solution's architectural and operational functionality.
- › **Strategy.** We reviewed each vendor's strategy to assess how each vendor plans to evolve its in-memory solution to meet emerging customer demands. We also evaluated each vendor's go-to-market approach, commitment, and direction strategies.
- › **Market presence.** To establish each EDW database product's market presence, we evaluated each solution provider's company financials, adoption, and partnerships.

### Evaluated Vendors Meet Functional, Architectural, And Market Presence Criteria

Forrester included 10 vendors in the assessment: Actian, Amazon Web Services, Hewlett Packard Enterprise, IBM, Microsoft, Oracle, Pivotal Software, SAP, Snowflake Computing, and Teradata. Each of these vendors has (see Figure 1):

- › **An enterprise-class data warehouse offering.** Vendors offer the following core EDW functional components, tools, and features: 1) support for core EDW features and functionality, including high availability, security, performance, scalability, and management; 2) support for analytical data storage for persistence, integrity, and access; 3) integration with one or more vendors to support BI, reporting, and other analytical solutions; 4) native tools or integration with third-party vendors to support data loading, unloading, transformation, and cleansing of analytical data sets; 5) support for multiple concurrent analytical SQL queries, aggregated data sets, and integrated data access; 6) the ability to deploy on-premises, in the public cloud, or both; and 7) tools that database administrators, data architects, and DW analysts can use to manage the EDW platform.
- › **A publicly available EDW release.** Each participating player must actively market an enterprise EDW solution or service that is clearly mentioned on its website marketing literature and brochures. The product version included in the evaluation must have been generally available prior to July 31, 2015.

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- › **A standalone EDW solution.** We included EDW products that are not technologically tied to any particular application, such as enterprise resource planning or customer relationship management; that are not tied to any particular BI, business performance solution, predictive analytics, extract-transform-load, or middleware stack; and that do not require embedding in other applications. The EDW solution can stand alone.
- › **Referenceable customers.** Each of the participating EDW vendors provided contact information for at least two customers that agreed to speak to Forrester about their use of the EDW solution.
- › **Significant interest from Forrester clients.** Forrester included only EDW vendors that have been mentioned by customers in at least five Forrester inquiry calls over the past 12 months.

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**FIGURE 1** Evaluated Vendors: Product Information And Inclusion Criteria

Vendor	Product evaluated
Actian	Vector Matrix Vector in Hadoop
Amazon Web Services	Amazon Redshift
Hewlett Packard Enterprise	HP Vertica Analytics Platform
IBM	DB2 with BLU Acceleration dashDB
Microsoft	SQL Server
Oracle	Database 12c Exadata Database Machine X5 Big Data Appliance X5
Pivotal Software	Pivotal Greenplum
SAP	SAP Hana Platform
Snowflake Computing	Snowflake Elastic Data Warehouse
Teradata	Teradata Unified Data Architecture: Teradata Database Aster Discovery Platform Teradata QueryGrid Teradata Hadoop Appliance Teradata Cloud

**Inclusion criteria**

The vendor has an enterprise-class data warehouse solution that offers all core data warehouse functional components, tools, and features and that was generally available before July 31, 2015.

The solution can stand alone and is not technologically tied to any particular application, performance solution, or stack.

The solution can run on-premises, in the cloud, or both.

The vendor can provide the names of at least two referenceable production customers that can vouch for the quality of its offering.

Forrester has seen significant interest in this vendor from our clients in the past 12 months.

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## Innovation And Real-Time Support Distinguish The Leaders

The evaluation uncovered an EDW market in which (see Figure 2):

- › **Oracle, Teradata, IBM, SAP, Amazon Web Services, and Microsoft lead.** The EDW Leaders — Oracle, Teradata, IBM, SAP, Amazon Web Services, and Microsoft — all support large enterprise customers' analytics needs that are core to businesses. They offer mature, high-performance, scalable, secure, flexible, and robust EDW solutions that often combine an analytics-optimized DW with query optimization, parallel loading, deep data compression, and mixed-workload management features. Oracle continues to be the most widely used EDW solution for on-premises and is now starting to make its presence felt in the cloud. Teradata continues to deliver high-end, scalable EDW solutions to support any DW requirement, now including expansion to the cloud. IBM has ramped up its analytics and data warehouse offering, improving on scale, performance, and compression, and it supports integrated PureData System appliances for analytics and operational analytics. SAP supports massively parallel columnar DW technology and, coupled with SAP Hana, delivers a scalable in-memory analytics platform. Amazon Web Services, a recent entrant in the EDW market, has done extremely well, gaining more than 5,000 customers, including some very large, petabyte-scale deployments. Microsoft is the second most widely used EDW solution; its cost-effective EDW software and appliances dominate the midmarket, and it is now expanding its adoption in the cloud.
- › **Pivotal Software, HPE, Actian, and Snowflake Computing offer competitive options.** This group has turned up the heat as high as it will go on the incumbent Leaders, with innovations that many customers find compelling. Pivotal Software continues to innovate and execute well on its strategy, increasing its adoption and offering integration with its own Hadoop distribution. HP Vertica has risen quickly into the top tier of EDW platform providers through its strategy, innovation, and commitment. Actian offers a viable analytical platform that integrates with its in-memory capabilities to support real-time analytics. Snowflake Computing, a new entrant in the EDW market, has done extremely well, delivering a platform in the cloud with compute and storage separation.

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



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**FIGURE 2** The Forrester Wave™: Enterprise Data Warehouse, Q4 '15 (Cont.)

	Forrester's Weighting	Action	Amazon Web Services	Hewlett Packard Enterprise	IBM	Microsoft	Oracle	Pivotal Software	SAP	Snowflake Computing	Teradata
<b>CURRENT OFFERING</b>	50%	3.48	3.91	3.54	4.24	3.77	4.70	3.16	4.15	2.54	4.63
Architecture	40%	3.63	3.68	3.20	4.18	4.05	4.48	3.20	4.28	2.13	4.75
Deployment	60%	3.39	4.06	3.77	4.28	3.58	4.85	3.13	4.06	2.82	4.55
<b>STRATEGY</b>	50%	3.05	4.05	3.10	4.05	4.05	4.15	3.67	4.05	2.71	4.10
Product strategy	90%	3.05	4.05	3.00	4.05	4.05	4.05	3.85	4.05	2.90	4.00
Corporate strategy and focus	10%	3.00	4.00	4.00	4.00	4.00	5.00	2.00	4.00	1.00	5.00
Cost	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>MARKET PRESENCE</b>	0%	2.33	4.48	3.48	3.95	3.95	3.95	2.70	3.93	0.60	3.30
Installed base	30%	2.00	5.00	4.00	5.00	5.00	5.00	3.00	5.00	1.00	3.00
Revenue	20%	1.00	3.00	3.00	5.00	5.00	5.00	3.00	5.00	1.00	5.00
Revenue growth	35%	3.00	5.00	3.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
Employees	10%	3.00	4.00	4.00	5.00	5.00	5.00	3.00	5.00	1.00	5.00
Licensing Partners/Resellers	5%	3.50	4.50	4.50	5.00	5.00	5.00	4.00	4.50	0.00	4.00

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

## Vendor Profiles

### Leaders

- › **Oracle's mature EDW solution focuses on cloud, real-time, and big data.** Oracle's dominant position in the database market, growing support for data management appliances, and end-to-end data integration platform give it a competitive advantage. With its Oracle Database in-memory option, it offers the ability to run completely in-memory, delivering low-latency access for transactional and analytical workloads. Oracle offers the ability to deploy EDW on several form factors, including an integrated Exadata appliance, cloud, virtualized offerings, and commodity servers. Some of its key differentiators are around its agile partitioning scheme, mature cost-based query optimizer, optimized indexing, and high-performance support for parallel query, processing, and execution. Oracle offers end-to-end security for its data warehouse platform that includes advanced auditing, access control, masking, and vulnerability assessment features. Oracle is now extending its data warehouse platform to support big data technologies, leveraging its Big Data

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SQL to query against Oracle, Hadoop, and other data repositories. Oracle continues to enhance its EDW solution by investing in storage optimization, data virtualization, compression, in-memory, cloud, hardware optimization, and automation.

- › **Teradata expands capabilities to support cloud, in-memory, and big data.** Teradata continues to offer the most comprehensive and scalable EDW platform. Teradata has a good revenue stream and is now starting to make a stronger play in big data, cloud, real-time, IoT analytics, and in-memory platforms. Key differentiators include one of the broadest sets of EDW packaging, licensing, and professional services options on the market. From a technology perspective, Teradata offers advanced EDW capabilities for in-database analytics, distributed indexing, query optimization, self-service and automation, workload management, distributed query, and security. Teradata's QueryGrid offers the ability to push query processing and data to any platform in the analytical ecosystem (e.g., Hadoop and Teradata Aster) and to some third-party databases (e.g., Oracle) and retrieve results into the Teradata spool space for integrating with data on the Teradata database. Although Teradata is not aggressive in the cloud, its recent announcement that it will support the Teradata database on AWS enables enterprises to choose a flexible hybrid data warehouse platform. Overall, Teradata remains a powerful EDW solution, especially for large, on-premises data warehouses where scalability, security, availability and integration are critical.
- › **IBM EDW appliances gain momentum with evolving cloud strategy.** IBM's significant DB2 and information management solution install base and large professional services organization give it a competitive advantage. IBM's key differentiators lie in its advanced data compression, in-database analytics, real-time streaming, automated resource management, preconfigured vertical data models, virtualization, scalable appliances, and native integration with Hadoop platforms. In addition, IBM DB2 with BLU Acceleration speeds up analytics and reporting, using in-memory columnar platform, parallel vector processing, and actionable and intelligent data compression. IBM offers its dashDB data warehouse cloud solution on IBM SoftLayer and Microsoft Azure; however, its adoption remains low, especially for large data warehouses. IBM has focused on continuing improvements in price and performance, scalability, automation, flexibility, workload management, and total cost of ownership. Overall, IBM has executed well on its EDW strategy and is likely to further extend its capabilities around cloud, in-memory, and real-time warehousing.
- › **SAP's data warehouse strategy focuses on real-time with SAP Hana.** SAP Hana is a distributed multitenant in-memory columnar massively parallel processing (MPP) database engine and application development platform often used for operational, analytical, and advanced analytical workloads. Enterprises are using SAP Hana for in-memory data marts and SAP BW implementations that integrate with other data warehouses, including SAP IQ. SAP's key differentiators include its shared-nothing, distributed in-memory data platform for real-time analytics, optimized data streaming and query processing, integrated data services layer, advanced compression, and security. For enterprises that want to leverage EDW on a cloud platform, both SAP Hana and SAP IQ are available on cloud platforms, including AWS, although most cloud deployments Forrester has seen remain small to midsize. In addition, Hana Enterprise Cloud (HEC),

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SAP's private managed cloud offering, is a viable platform for organizations looking for a dedicated cloud platform. Although SAP has not been aggressive with Hadoop, recent announcements of its launch of SAP Hana Vora, a new in-memory query engine that extends the Apache Spark execution framework to provide enriched interactive analytics on Hadoop, will benefit enterprises across various vertical industries.

- › **Amazon Web Services picks up speed in the EDW market.** With more than 5,000 customers, Amazon Redshift is one of the fastest-growing services in the history of AWS. Today, enterprises are using Amazon Redshift to support medium- to large-scale data warehouse and data mart deployments. Some of the largest deployments of Amazon Redshift are well over a petabyte, storing billions of data sets to support advanced analytics. Amazon Redshift has an MPP architecture that can distribute data across multiple nodes in a cluster and deliver a high degree of automation and parallelism to support data warehouse functions. A key differentiator for AWS is its scalable columnar data store, tight integration with Amazon EC2 and S3 platforms, advanced compression, integrated security, scale, and high performance. A multiple-rotation, 24x7 operations team and multiple automated systems monitor Amazon Redshift's service. While migrating data to Redshift from on-premises to cloud is often not straightforward, Amazon's new Snowball offering can make it simpler. Overall, enterprises choose Amazon Redshift largely because of its low cost, high degree of automation, elastic on-demand scale, and integration with additional Amazon services such as backup, recovery, Hadoop, streaming, and security.
- › **Microsoft extends its data warehouse platform to the cloud.** Microsoft's significant presence in database, online analytical processing (OLAP), online transaction processing (OLTP), BI, spreadsheet, PowerPoint, and cloud gives it a strong competitive advantage. Microsoft's data warehouse platform includes SQL server, Analytics Platform System (APS), Azure SQL Data Warehouse, and HDInsight for Hadoop. The recent release of Azure SQL Data Warehouse in the cloud enables enterprises to scale data warehouses beyond tens of terabytes into petabyte-scale warehouses. Enterprises can deploy Microsoft SQL Server flexibly in diverse EDW and BI topologies as well as integrate the DBMS with the vendor's diverse application platform, middleware, BI, performance management, and desktop software solutions. Furthermore, SQL Server supports diverse BI, query, OLAP, advanced analytics, and real-time workloads. It provides sophisticated caching, compression, partitioning, indexing, cost-based query optimization, and workload management functionality. Enterprises like Microsoft's lower total cost of ownership, automation, skills availability, and support for hybrid (on-premises and cloud) platforms. Overall, Microsoft's data warehouse platform is great for enterprises that are looking for low-cost, highly automated, scalable, secure, and hybrid data warehouses.

**Strong Performers**

- › **Pivotal Software becomes more aggressive in the EDW space.** We're seeing Pivotal leveraging the large EMC install base to market its Pivotal Greenplum DB. Pivotal continues to execute well on its data warehouse strategy, extending its core features to meet growing enterprises' demands,

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especially around big data, scalability, automation, and security. Greenplum DB incorporates hybrid storage and execution (both row-and-column storage) to deliver a flexible platform to support multiple workloads. Enterprises often mention its lower cost, automation, performance and scalability features, standards, and good support when comparing it with other vendors. The Greenplum DB offers integration with Hadoop, allowing it to directly manipulate data stores in a wide variety of distributions, including Cloudera, Hortonworks, and MapR. It supports advanced functionality like predicate pushdown and fully parallel communication to allow for efficient bi-directional utilization of data in both platforms. Pivotal also offers a query optimizer for big data that is not confined inside a single database but can leverage Pivotal Greenplum DB and Pivotal HDB, based on Apache HAWQ (incubating). Recently, Pivotal made Greenplum DB open source.

- › **Hewlett Packard Enterprise gains momentum in the EDW market.** HP Vertica Analytics Platform is an MPP, shared-nothing data warehouse that is scalable to support large workloads. Vertica continues to show strong growth and momentum in the EDW market, especially at the high end. Its key differentiators include high-end scale, performance, advanced compression, shared-nothing architecture, advanced indexing, automatic design and tuning, workload management, distributed query optimization, and automation. HPE has a big data analytics platform that includes the Vertica analytics database, the IDOL information and analytics engine for deriving meaning from unstructured data (audio, video, and text), and other technologies. While Forrester does not see many HP Vertica cloud deployments, HPE offers dedicated and multitenant data warehouse deployments on AWS and HP Helion. HP Vertica supports streaming via Kafka. HPE plans to further extend its data warehousing platform to support even larger, petabyte-scaled data warehouses with minimal administration and to improve on security and integration.
- › **Action ramps up its offering by focusing on real-time and cloud.** Actian offers its Actian Analytical Platform (AAP), comprising software components from its acquisitions of ParAccel, Pervasive, and Vectorwise. AAP integrates with all leading Hadoop distributions and can run the solution natively in Hadoop distributed file system (HDFS). It is also optimized for distributed in-memory to deliver real-time analytics. The Actian platform provides native extract, transfer, and load/data integration capabilities via its open architecture and also integrates with ETL vendors and open source capabilities. In addition to its on-premises platform, Actian supports deployment across AWS, Microsoft Azure, Microstrategy Cloud, Rackspace, and VMware vCloud Air. The AAP platform can exploit single instruction, multiple data (SIMD) capabilities, processing data vectors through a streaming SIMD extensions instruction set. Enterprises that have been using AAP claim that it offers reasonably good automation and data integration and is an economical, secure, and scalable data platform that's critical for them to deliver real-time, actionable business insights. Actian is likely to expand its AAP platform to further innovate around large distributed hybrid platforms and improve on automation, scale, security, and integration.
- › **Snowflake Computing launches a viable cloud enterprise data warehouse alternative.** Snowflake Computing is a startup company and the latest entrant in the data warehouse space. It delivers an elastic data warehouse solution in the cloud, offering a highly automated platform

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that makes loading, unloading, and administration simpler. To date, the company has raised \$71 million in funds and recently made its product generally available. Unlike traditional data warehouse systems, Snowflake decouples compute from storage, allowing customers to use resources in a more optimized and cost-effective manner. Snowflake scales up and down elastically to deliver computing resources as needed. Currently, Snowflake runs on Amazon Web Services and is likely to support other cloud solutions in the near future. It natively supports standard SQL and provides connectivity using ODBC and JDBC to make the platform available to a broad range of access, administration, and development tools. The Snowflake service is multitenant but processes each customer's queries by compute clusters dedicated to that customer. Snowflake's elastic and low-cost platform is worth looking at for companies that want highly automated DWaaS in the cloud to support new and emerging analytical workloads.

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## Supplemental Material

### Online Resource

The online version of Figure 2 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

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**Data Sources Used In This Forrester Wave**

Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution:

- › **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 reference calls.** To validate product and vendor qualifications, Forrester also conducted reference calls with two 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 document — and then score the vendors based on a clearly defined scale. These default weightings are intended only as a starting point, and we 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**

All of Forrester's research, including Forrester Wave evaluations, is conducted according to our Integrity Policy. For more information, go to <http://www.forrester.com/marketing/policies/integrity-policy.html>.

We work with business and technology leaders to develop customer-obsessed strategies that drive growth.

#### PRODUCTS AND SERVICES

- › Core research and tools
- › Data and analytics
- › Peer collaboration
- › Analyst engagement
- › Consulting
- › Events

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Forrester's research and insights are tailored to your role and critical business initiatives.

#### ROLES WE SERVE

##### **Marketing & Strategy Professionals**

CMO  
B2B Marketing  
B2C Marketing  
Customer Experience  
Customer Insights  
eBusiness & Channel Strategy

##### **Technology Management Professionals**

CIO  
Application Development & Delivery  
› **Enterprise Architecture**  
Infrastructure & Operations  
Security & Risk  
Sourcing & Vendor Management

##### **Technology Industry Professionals**

Analyst Relations

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#### CLIENT SUPPORT

For information on hard-copy or electronic reprints, please contact Client Support at +1 866-367-7378, +1 617-613-5730, or [clientsupport@forrester.com](mailto:clientsupport@forrester.com). We offer quantity discounts and special pricing for academic and nonprofit institutions.