Magic Quadrant for Data Management Solutions for Analytics

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Disruption slows as cloud and nonrelational technology take their place beside traditional approaches, the leaders extend their lead, and distributed data approaches solidify their place as a best practice for DMSA. We help data and analytics leaders evaluate DMSAs in an increasingly split market.

Market Definition/Description

Gartner defines a data management solution for analytics (DMSA) as a complete software system that supports and manages data in one or many file management systems, most commonly a database or multiple databases. These management systems include specific optimization strategies designed for supporting analytical processing — including, but not limited to, relational processing, nonrelational processing (such as graph processing), and machine learning or programming languages such as Python or R. Data is not necessarily stored in a relational structure, and can use multiple data models — relational, XML, JavaScript Object Notation (JSON), key-value, graph, geospatial and others.

Our definition also states that:

- A DMSA is a system for storing, accessing, processing and delivering data intended for one or more of the four primary use cases Gartner identifies that support analytics (see Note 1).
- A DMSA is not a specific class or type of technology; it is a use case.
- A DMSA may consist of many different technologies in combination. However, any offering or combination of offerings must, at its core, exhibit the capability of providing access to the data under management by open-access tools.
- A DMSA must support data availability to independent front-end application software, and include mechanisms to isolate workload requirements and control various parameters of end-user access within managed instances of data.
- A DMSA must have administrative control of the data it is using; the data may be persisted outside the DMSA on a variety of storage options, including distributed object stores, or other persistent file systems.

- There are many different delivery models, such as stand-alone DBMS software, certified configurations, database platform as a service (dbPaaS) offerings and DBMS appliances. These are evaluated in the analysis of each vendor.

Magic Quadrant

Figure 1. Magic Quadrant for Data Management Solutions for Analytics

Source: Gartner (January 2019)

Vendor Strengths and Cautions

Alibaba Cloud

Alibaba Cloud is the cloud computing division of Alibaba Group Holding, a multinational conglomerate based in Hangzhou, China. It offers a wide variety of services, such as ApsaraDB

for RDS (relational database service) for MySQL, SQL Server and PostgreSQL; and HybridDB for PostgreSQL, based on the open-source Pivotal Greenplum Database. Also, HybridDB for MySQL, AnalyticDB for online analytical processing (OLAP) analysis; MaxCompute for large data warehouse implementations; and E-MapReduce for Hadoop. In addition, Apsara Stack Agility provides an on-premises private cloud implementation.

Strengths

- **Broad and deep portfolio:** Alibaba Cloud offers a wide range of products for DMSA that spans all the defined use cases in this Magic Quadrant. This provides its customers with many and, in some cases, multiple options to address a broad spectrum of DMSA use cases. As with most cloud providers, Alibaba Cloud follows a best-fit engineering approach, with specific point solutions designed to solve specific problems.
- **Financial strength:** Like Amazon Web Services (AWS), Alibaba Cloud has funded its expansion and global reach through the success of parent company Alibaba Group's retail operations. These deep financial resources have allowed Alibaba to expand aggressively into overseas markets, building on a strong base in its home market in China.
- **Cloud leader in Asia/Pacific:** Alibaba has an extremely strong presence in China and Asia/Pacific, making it an excellent choice for deployments serving these global regions.

Cautions

- **Confusing product portfolio:** It can be difficult for potential customers to navigate Alibaba's cloud product portfolio. In some cases, the targeted use cases are straightforward. But for data management solutions for analytics, multiple products have overlapping functionality (such as HybridDB and AnalyticDB), which can make it challenging to understand which one to select.
- **Quality of documentation:** Documentation appears to be a work in progress. Some products have no online documentation and others have very thorough documentation. Users outside of China can expect different levels of quality and comprehensiveness compared to the Chinese-language documentation within China.
- **Geopolitical climate in North America:** Due to the current geopolitical climate in North America, Alibaba's expansion into this geography may be slower to materialize. Alibaba Group Holding, the parent company of Alibaba Cloud, has reportedly reduced its investment in North America. While this pullback does not appear to have directly impacted Alibaba Cloud, which continues to invest in North America, it has raised questions about continued focus and market traction in the region.

Amazon Web Services

Amazon Web Services (AWS) is a wholly owned subsidiary of Amazon, which is based in Seattle, Washington, U.S. AWS offers Amazon Redshift, a data warehouse service in the cloud. Amazon Redshift includes Redshift Spectrum, a serverless, metered query engine that uses the same

optimizer as Amazon Redshift, but queries data in both Amazon Simple Storage Service (S3) and Redshift's local storage. It also offers Amazon S3, a cloud object store; AWS Lake Formation, a secure data lake service; AWS Glue, a data integration and metadata catalog service; and Amazon Elasticsearch, a search engine based on the Lucene library. Additional offers include Amazon Kinesis, a streaming data analytics service, Amazon Elastic MapReduce (EMR), a managed Hadoop service; Amazon Athena, a serverless, metered query engine for data residing in Amazon S3; and Amazon QuickSight, a business intelligence (BI) visualization tool. Amazon Neptune provides graph capabilities.

Strengths

- **Cloud colossus:** AWS is generally acknowledged to be the leading cloud service provider by a significant margin. This provides a large fleet of resources that can serve as a basis for machine learning (ML) and optimization data, which can then be applied to the various DMSA offerings. It also means that there will be a ready pool of third-party resources available in the technology and labor markets.

- **Financial strength and stability:** AWS growth accounted for more than 40% of the growth of the entire DBMS market in 2017, which not only provides it with financial muscle, but enlarges the base of expertise for its services.

- **Expanding reach:** AWS has started to offer capabilities to bring together different services with newer offerings such as AWS Glue, a metadata cataloging and data integration service, and Amazon QuickSight, a BI visualization tool. AWS has also begun a push toward an on-premises presence, by making some of its Relational Database Services available on VMware. It also announced AWS Outposts, in November 2018, which will include Amazon EMR when it launches in 2019, or shortly thereafter.

Cautions

- **Integration complexity:** AWS has consistently taken a "best fit" engineering approach, offering different services to address different use cases. This approach can lead to increasing integration issues as organizations attempt to use data and offerings that span multiple use cases. The increased adoption of cloud object stores, as a unified data persistence layer, and metadata tools such as Glue may help mitigate management challenges.

- **Value for money, pricing and contract flexibility:** Customer references for AWS generally gave it high scores for evaluation and contract negotiation. Surprisingly, however, the same did not apply to the value for money, pricing and contract flexibility scores this year. AWS was placed in the bottom quartile of vendors in this Magic Quadrant for perceived value for money, and in the bottom half for pricing and contract flexibility. This may reflect less awareness of the performance improvements in Redshift, and new cost optimization features, such as AWS Redshift Concurrency Scaling, that have only recently become available.

- **Product capabilities:** Although all reference customers for AWS scored their satisfaction with the product capabilities as average or better, AWS had one of the lowest average scores for its product capabilities. Further, a relatively high number of reference customers reported performance problems among the issues they encountered. This is likely to reflect the fact that Redshift has been relatively slow to adopt some key features that are expected by modern cloud DMSA environments — such as dynamic elasticity, automatic tuning, and separation of compute and storage resources. The vendor is aggressively adding new features and capabilities to the portfolio, so we expect this to improve over the coming year.

Arm (Treasure Data)

Arm Treasure Data, recently acquired by Arm, is based in Mountain View, California, U.S. It provides a Customer Data Platform (CDP). CDP is a fully managed DMSA running on AWS infrastructure, with availability in regions of the U.S. and Japan. CDP provides a cloud data lake, combined with relational data marts. The ability to ingest data from a wide range of sources, and to feed data to downstream data management platforms and enterprise applications, are a focus for Arm Treasure Data.

Strengths

- **Financial strength and stability:** Treasure Data was acquired by Arm Holdings (part of SoftBank Group) in 2018. The acquisition provides Arm Treasure Data with the financial stability required to invest in growing the business.
- **Vertical industry expertise and Internet of Things:** Arm Treasure Data has deep vertical industry expertise in retail, automotive, consumer packaged goods and gaming. It has leveraged its Internet of Things (IoT) capabilities to provide strong data ingest and data lake analytics capabilities that align with these verticals. The CDP offering is able to blend operational data with data lake exploration and data science use cases.
- **Customer satisfaction:** Arm Treasure Data's customer reference scores placed it in the top half of the vendors in this Magic Quadrant for almost every evaluated category. Notable bright spots included technical support, ease of deployment, and overall experience of doing business with the vendor.

Cautions

- **Product complexity:** Customer references for Arm Treasure Data reported that the product can be difficult to manage and troubleshoot, and that it is better aligned to more advanced users. This may, in part, be reflective of the kinds of use cases Arm Treasure Data is being used to address, which typically include complex IoT environments that ingest data from numerous sources.
- **Value for money:** Arm Treasure Data's customer reference scores placed it in the bottom half of the vendors for value for money. A number of respondents noted that the product could be expensive to scale compared with other cloud competitors.

- **Customer expansion:** Surprisingly, given the generally high customer satisfaction scores noted above, nearly half of the customer references for Arm Treasure Data indicated that they did not intend to purchase additional licenses in the coming 12 months. This was the lowest score of any vendor in this Magic Quadrant for this metric. It could indicate a number of things, including the longer time frames required to complete initial production deployments; it could also indicate that the initial deployments were appropriately sized and do not yet require additional investment.

Cloudera

Cloudera, which is based in Palo Alto, California, U.S., offers the Cloudera Enterprise platform. Versions of this include Cloudera Enterprise Data Hub, and Cloudera Data Warehouse (for business intelligence and SQL workloads based on Apache Impala). Additional versions include Cloudera Data Science & Engineering (for data processing and ML based on Apache Spark and Cloudera Data Science Workbench), and Cloudera Operational DB (for real-time data delivery based on Apache HBase and Apache Kudu). Through its shared data experience (SDX) technologies, the platform provides unified security, governance and metadata management across these workloads, as well as across deployment environments. Cloudera Workload XM provides tools to efficiently migrate, analyze, optimize and scale analytics workloads. Cloudera's platform is available on-premises; across the major cloud environments (including native object store support for Amazon S3 and Azure Data Lake Store); and as a managed service under the Cloudera Altus brand.

Strengths

- **Data science focus:** Cloudera continues to pursue major market trends and to adapt to customer demands. In particular, Cloudera has made a strong push toward supporting data science, artificial intelligence (AI) and ML use cases in 2018.
- **Continued growth:** Cloudera continues to see sustained growth in the market — growing above the rate for the DBMS market overall. Organizations looking for data lake implementations on-premises, or looking for a strategy that does not lock them into a particular deployment environment, value Cloudera's offering. The recent announcement of the merger with Hortonworks will further reinforce Cloudera's market position.
- **Quality of training resources:** Cloudera's customer reference scores placed it in the top third of vendors in this Magic Quadrant for the quality and availability of end-user training. Most of Cloudera's reference customers reported a positive experience.

Cautions

- **Transition to cloud:** As an increasing number of organizations turn to cloud implementations for their DMSA needs, Cloudera faces strong competition. This comes from cloud-native offerings and from new approaches to addressing data science and exploratory use cases — such as cloud object stores combined with a query engine such as Spark. While Cloudera offers a comprehensive data management platform that addresses multiple use cases and

needs, this may not resonate with the point solution deployment approach popular among cloud adopters. However, Cloudera's cloud implementation operates directly over an existing cloud object store, eliminating any requirement for data to be copied onto another service. This method of bringing the compute to the storage may facilitate deployment for organizations already managing their data in the cloud.

- **Merger with Hortonworks:** Cloudera has recently entered into an agreement with Hortonworks to merge the two companies. Each individual product is expected to be supported for the next three years. However, as the two companies unify their products, by integrating features and capabilities, there is uncertainty in the customer base about what the implications of this will be and what impact this may have on their deployments. Greater clarity on this should emerge as the two companies complete their merger in 2019.

- **Traditional data warehouse use-case support:** The market has established that Cloudera is best-suited to data lake and context-independent use cases. Both customer references and Gartner clients highlight the need for Cloudera to continue to improve performance and workload management for Impala, which forms the basis of how data warehousing workloads are supported. The vendor continues to invest in improvements to massively parallel processing (MPP) relational processing in the Apache Impala MPP Query Engine, Apache Kudu, and workload management, which should help.

GBase

GBase is a trading name of Tianjin Nanda General Data Technology, which is based in Beijing, China. GBase offers GBase 8a, a relational MPP data warehousing platform; GBase Infinidata 8a, a data warehouse appliance; and GBase HD, a Hadoop distribution based on Apache Hadoop. It also offers GBase UP, a logical data warehouse (LDW) platform supporting data virtualization between GBase 8a, GBase HD and other platforms; and GBase cloud DB (GBase 8a), available in the QingCloud app center.

Strengths

- **LDW capabilities and vision:** With GBase UP, this vendor has implemented a strong LDW product base combining traditional MPP relational processing with exploratory use cases based on Hadoop infrastructure.

- **Customer loyalty:** Every respondent to our customer reference survey indicated that they were planning to purchase additional licenses from GBase, and a relatively high percentage indicated that they would recommend the product to others.

- **Pricing and contract flexibility:** Respondents to our customer reference survey scored GBase very highly for pricing and contract flexibility.

Cautions

- **Limited global presence:** More than 85% of GBase's deployments are in the Asia/Pacific region, with most of those being in its home market of China. Limited deployments are seen

in Europe, the Middle East, Africa and South America. There is, as yet, no meaningful presence in North America.

- **Limited public cloud offerings:** GBase is not broadly available in public cloud infrastructure outside of China. Even within China, it is not on Alibaba Cloud — the cloud market leader for the Chinese market.
- **Quality of documentation:** Customer references for GBase report that its documentation is not always up to date, especially for new features and new releases.

Google

Google, based in Mountain View, California, U.S., is a wholly owned subsidiary of the Alphabet holding company. Google Cloud is the part of Google that focuses on delivering solutions and services to the business market. Google's dbPaaS offerings in the Google Cloud Platform include BigQuery, a serverless, managed data warehouse offering; Cloud Dataproc, a managed Spark and Hadoop service; and Cloud Dataflow, focused on stream and batch processing of data.

Strengths

- **Ease of use and performance:** Google Cloud's reference customers all mentioned the outstanding performance of the product, combined with the ease of use and implementation. The majority of references reported deployments of more than 50TB, and more than half of the references load data either continuously or many times per day.
- **Diverse use cases:** Google's BigQuery capabilities allow customers to address a wide range of use cases — from the traditional data warehouse to data science use cases — by integrating ML capabilities in BigQuery ML, and integrating them in Cloud Dataflow. The continuous ingest capabilities make the solution also suitable for an operational or real-time data warehouse.
- **Increased market traction:** Google Cloud is gaining in market traction overall. This manifests itself in increasing numbers of Gartner client inquiries where BigQuery and Google Cloud Platform are mentioned, as well as in the fast-growing partner ecosystem of service providers, and BI and data integration vendors, for example.

Cautions

- **Maturing enterprise focus:** Many of the offerings in Google Cloud Platform services were originally developed to support Google's core consumer-focused business. The platform gained initial traction from cloud-native organizations, and is now seeing increased enterprise adoption. While Google Cloud Platform services have all matured as enterprise-class products, Google Cloud is still ramping up its go-to-market strategy for enterprise sales.
- **Administration, management and technical support:** While having a fully managed service with BigQuery is seen as an advantage, a number of reference customers for Google

indicated a lack of management and administration as being an issue. Further, some reference customers expressed challenges with technical support, and reference survey scores for technical support were below average.

- **Cost predictability:** Google Cloud reference clients indicated that it can be challenging to manage the overall cost with Google Cloud Platform, whether it is for data loading or query processing across changing workloads. While BigQuery does offer flat-rate pricing to help address this, increased administration and management capabilities would also help in optimizing price/performance.

Hortonworks

Hortonworks is based in Santa Clara, California, U.S. It offers a Hadoop distribution called Hortonworks Data Platform (HDP); and Hortonworks DataFlow for streaming data delivery and ingestion, powered by Apache NiFi; and the Azure HDInsight service for Microsoft Azure. It also offers Hortonworks Data Cloud Hadoop service for AWS; and Hortonworks DataPlane Service, a unified architecture to manage, govern, store, process and access datasets across multiple use cases and across multiple hybrid deployment environments, including multicloud and on-premises.

Strengths

- **Exploratory use-case support, multicloud and edge computing:** Reference customers for Hortonworks praised its flexibility in managing diverse types of data, primarily for the exploratory and discovery use cases associated with data lakes. Hortonworks DataPlane Service provides capabilities to manage data lakes in multiple deployment environments — both cloud and on-premises. Additionally, Hortonworks DataFlow for streaming data delivery was also frequently cited as a differentiator.

- **Open-source alignment:** Both Hortonworks and its customers view alignment with the open-source stack as a significant plus. This alignment has also been instrumental in helping Hortonworks build strong partnerships with other vendors such as IBM and Microsoft.

- **Customer loyalty:** Nearly all of Hortonworks' reference customers indicated their intent to purchase additional licenses during the next 12 months.

Cautions

- **Ease of deployment and integration:** Hortonworks' reference scores for ease of deployment and integration were some of the lowest. The complexity of the product was frequently called out, and many references reported needing professional services help with their initial deployments.

- **Transition to cloud:** As an increasing number of organizations turn to cloud implementations for their DMSA needs, Hortonworks faces strong competition. This comes from cloud-native offerings and from new approaches to addressing data science and exploratory use cases — such as cloud object stores combined with a query engine such as Spark. To address this, as

part of its roadmap, Hortonworks recently announced the Open Hybrid Architecture Initiative, which will offer a consistent user experience from on-premises to cloud.

- **Merger with Cloudera:** Hortonworks has recently entered into a merger agreement with Cloudera. While support for the separate products is expected to continue for the next three years, as these two companies unify their products some features and capabilities may well be replaced by the Cloudera equivalents.

Huawei

Huawei, based in Shenzhen, China, offers the FusionInsight Big Data platform, a data management platform that combines components of Apache Hadoop, Spark and Storm with FusionInsight GaussDB 200, a proprietary MPP DBMS. Huawei has added industry-specific domain models, proprietary extensions to the Hadoop platform for event stream processing, graph and ML capabilities, and a unified SQL engine that is compatible with its MPP database and runs on Hadoop. Additional enhancements have been made to the Hadoop scheduler with Huawei's Superior Scheduling Engine, and to the supported Hadoop Distributed File System (HDFS) file formats with Apache CarbonData. Huawei's offerings are also available in the public cloud, through its partners.

Strengths

- **Industry expertise:** Huawei's traditional technological strength is in the telecommunications vertical, and its expertise in this area contributes to adoption of its data management and analytics offerings for this market, especially in China.
- **Financial strength and stability:** Huawei is a very large company with significant financial reserves, which will allow it to continue to invest in this market for the foreseeable future — regardless of the profitability of its DMSA offerings.
- **Customer loyalty and satisfaction:** The vast majority of Huawei's customer references indicated their intent to purchase additional licenses from the vendor during the coming 12 months.

Cautions

- **Limited DMSA awareness outside of Asia/Pacific Region:** Huawei is a giant in some technology areas worldwide, but its market mind share for its DMSA products outside of the Asia/Pacific region remains small. The majority of its success is in the core telecommunications vertical. One reason for Huawei's lack of market presence outside the Asia/Pacific region, is the current geopolitical landscape affecting operations in North America. However, in our reference survey, Huawei was rarely considered by customer references that had not selected it. Potential end-users outside of these core geographies and verticals may experience less-polished delivery and capabilities.
- **Limited scope of feedback coverage:** As with last year, Huawei's reference survey results did not always match our other data points (including Gartner inquiry service data) on the state

of the market and Huawei's market mind share, penetration and capabilities. This could reflect the fact that the references for Huawei were heavily skewed toward the Asia/Pacific region, despite Huawei's market presence in other geographies. A concerted effort to build recognition and market awareness outside of China would help.

- **Ease of implementations:** Huawei had one of the highest numbers of complaints from reference customers concerning its ability to support complex implementations. This may be partially related to the scope and complexity of the use cases that FusionInsight supports, thereby reflecting the complexity of the use cases rather than the product capabilities. The vendor reports improved customer satisfaction in this area during the past year, and has invested in improving the quality of its documentation and ease of its installation processes, which should help.

IBM

IBM, which is based in Armonk, New York, U.S., offers stand-alone DBMSs (Db2, Db2 for z/OS, Informix) and appliances (PureData System for Analytics, PureData System for Operational Analytics, Integrated Analytics System, Db2 Analytics Accelerator). Also, Hadoop solutions (BigInsights), managed data warehouse cloud services (Db2 Warehouse on Cloud), and private cloud data warehouse capabilities (Db2 Warehouse). IBM's Db2 BigSQL and Fluid Query provide a consolidated access tier to a wide range of DBMSs and Hadoop distributions. IBM's Db2 Event Store provides a data management foundation for IoT and time series event data.

Strengths

- **Broad and diverse portfolio:** IBM's product portfolio provides deep functionality across a wide range of analytics use cases. More recent additions to the portfolio, such as Db2 Event Store, serve to expand the capabilities of IBM's DMSA-focused offerings.
- **IDAA integration with z/OS, and performance:** The IBM Db2 Analytics Accelerator for z/OS is a highly differentiated solution providing high-performance analytics for data residing in Db2 on mainframes. References for IBM praised the integration of the IBM Db2 Analytics Accelerator with Db2 for z/OS. Security and performance were called out as core strengths.
- **Rich SQL functionality for Hadoop:** A number of IBM's references customers praised the rich Db2 SQL functionality in IBM's Big SQL product, which provides a SQL interface to Hadoop environments, citing the maturity and completeness of the SQL product.

Cautions

- **Customer traction on new products and offerings:** PureData System for Analytics (Netezza) is being phased out in favor of IBM's Integrated Analytics System (IAS), a Db2-based appliance. We have yet to see significant impact as expressed by revenue growth or customer uptake of the new offering. Further, IBM Cloud is rarely mentioned by users of Gartner's client inquiry service when considering and evaluating cloud vendors.

- **Service and support experience:** Respondents to our customer reference survey reported suboptimal experiences with support. Survey scores for service and support were below average for this Magic Quadrant.
- **Software fixes and improvements required, particularly for newer products:** A portion of IBM's reference customers reported issues with its products — particularly with initial implementation and integration activities. These issues appear to be associated with newer product offerings, though customers do report improvements with recent releases.

MapR Technologies

MapR Technologies, which is based in San Jose, California, U.S., offers its Converged Data Platform (CDP) in both open-source and commercial software editions. CDP features include performance and storage optimizations using Network File System (NFS) and MapR-XD, a scalable POSIX-compliant data storage tier; and MapR-DB, a nonrelational DBMS supporting key value, document, wide-column, graph and time series models. It also includes event-streaming capabilities (MapR-ES); high-availability improvements; and administrative and management tools. MapR Edge, a small-footprint edition of CDP, extends MapR's reach to edge-processing use cases common to IoT environments.

Strengths

- **Hadoop-compatible alternative with strong operational capabilities:** With the recent merger of Cloudera and Hortonworks, MapR is the only other major vendor in this Magic Quadrant dedicated to a Hadoop-compatible solution. Hadoop customers that may be concerned about the impact of the Cloudera-Hortonworks merger may find much to like in an alternative approach. Further, MapR's focus has always been on providing a differentiated Hadoop-based offering with strong container support and alternatives to the core Hadoop stack, such as the MapR file system.
- **Customer loyalty:** The vast majority of MapR's customer references indicated their intent to purchase additional licenses from the vendor, placing MapR in the top quartile of vendors for this measure of customer loyalty.
- **Overall experience of doing business:** Customer references for MapR scored it highly for both the overall customer experience, and evaluation and contract negotiation.

Cautions

- **Dominant competition:** The Hadoop-based market is undergoing a great consolidation with the planned merger of Cloudera and Hortonworks, which could shift some market momentum toward the new giant vendor. While the ultimate market impact remains to be seen, the uncertainty related to this merger has created market opportunities for MapR. We believe these to be time-limited in duration as merger transition friction plays itself out over the coming year.

- **Challenging deployments:** Customer reference scores for MapR placed it in the bottom third of the vendors in this Magic Quadrant for ease of integration, deployment, quality of training, technical support, and availability of third-party resources. These comparatively low scores in the above-named categories are usually associated with difficulty in deploying DMSA solutions, and may indicate challenges within the customer base with getting into production. However, they may also be reflective of the complexity of MapR customers' projects and the enterprise environments in which they deploy.

- **Transition to cloud:** As an increasing number of organizations are turning to cloud implementations for their DMSA needs; MapR faces strong competition. This competition comes from cloud-native offerings, and from new approaches to addressing data science and exploratory use cases — such as cloud object stores combined with a query engine like Spark. While MapR's core strength lies in delivering a complete enterprise-scale data platform, the associated complexity and depth of that strength is challenged in cloud environments where best-fit approaches characterized by point solutions still dominate.

MarkLogic

MarkLogic, which is based in San Carlos, California, U.S., offers a nonrelational multimodel DBMS, which it describes as "operational and transactional." The product is available in two editions: Essential Enterprise and a free Developer edition. Essential Enterprise can be deployed on-premises, in the cloud, and across hybrid infrastructures, including those of AWS, Microsoft Azure and the Google Cloud Platform, as well as on VMware, Pivotal's Cloud Foundry, and Red Hat platforms. MarkLogic also offers a Data Hub for integrating data, either on-premises or as a cloud service.

Strengths

- **Strong and differentiated vision:** MarkLogic has a strong and unique vision for bringing data together across multiple data platforms and data types. MarkLogic's data hub approach with automated data integration and harmonization should resonate with customers looking to make sense of disparate and complex data management landscapes.

- **Technical and enterprise capabilities:** MarkLogic's focus on data integration and harmonization builds on a sound foundation of document and graph database technology combined with enterprise capabilities — such as atomicity, consistency, isolation and durability (ACID) support — rarely seen in nonrelational DBMSs.

- **Innovative cloud pricing model:** MarkLogic's cloud-based Data Hub Service has an innovative pricing model that combines the flexibility of serverless pricing and dynamic elasticity with the pricing predictability typically associated with less-flexible models.

Cautions

- **Market mind share:** MarkLogic's biggest problem is its low mind share in this market. Its customers are happy, and its footprint is expanding, but many potential customers have not

even heard of MarkLogic, and users of Gartner's client inquiry service rarely mention this vendor. Among the customer references for this Magic Quadrant, MarkLogic was almost never considered by those not selecting it.

- **Sales execution and revenue growth:** According to Gartner's DBMS market share numbers for 2017, MarkLogic grew at only 3% compared with the overall market growth of nearly 13%. This below-market growth is, in part, attributable to temporary effects from its shift to subscription-based pricing models.
- **Ease of deployment and availability of third-party resources:** MarkLogic's customer reference scores for ease of deployment and the ready availability of third-party resources placed it very low among the vendors in this Magic Quadrant. This is not unexpected, because MarkLogic presents a highly differentiated vision of the DMSA market that is not always well understood.

Micro Focus

Micro Focus, which is based in Newbury, U.K., offers the Vertica analytics platform. This platform is available as Vertica Enterprise, a columnar relational DBMS delivered as a software-only solution for on-premises use. It is also available as Vertica in the Clouds, as machine images from the AWS, Microsoft Azure and Google Cloud Platform marketplaces; and as Vertica for SQL on Hadoop. Micro Focus also recently announced Vertica in Eon Mode (available on AWS), which enables the separation of compute and storage to capitalize on cloud economics and dynamic workloads by scaling compute resources independently of shared storage.

Strengths

- **In-database analytics, ML and data science capabilities:** This vendor continues to invest in data science and ML capabilities, with an extensive library of algorithms that can run inside the database. The ability to handle a wide variety of data formats — including JSON, and Apache Avro, Parquet, and Optimized Row Columnar (ORC) — only enhances these capabilities.
- **Customer experience:** Vertica customers praise its capabilities and report a positive experience when working with the vendor. Customer reference scores placed it in the top third of the vendors for overall experience, value for money, service and support, product capabilities, integration and deployment, and system availability.
- **Scalability and performance:** Customer references praised Vertica's ability to scale; performance was also frequently cited by them as a key value proposition.

Cautions

- **Declining mind share and market share:** According to Gartner's market share numbers for 2017, Vertica's share declined 18% in a DBMS market that grew 12.7%. Customer reference scores for Vertica placed it very low for availability of third-party resources, and Vertica is almost never considered by those who did not purchase it.

- **Maintenance and administration effort:** While reference customers for Vertica reported outstanding performance and stability, they also regularly call out the maintenance and administration effort that is required to get the product to perform. However, in many cases, these customers report that once the initial implementation work has been completed, the ongoing administrative overheads are generally low.

- **Slow to cloud:** While Vertica is available on major cloud service providers, the product is delivered in an infrastructure as a service (IaaS) form factor — with no fully managed dbPaaS offering. A number of reference customers highlighted this shortcoming. With an abundance of dbPaaS offerings for DMSA, Vertica remains behind the market in these capabilities.

Microsoft

Microsoft, which is based in Redmond, Washington, U.S., offers SQL Server as a software-only solution with certified configurations. It also sells Azure SQL Data Warehouse (fully managed, MPP cloud data warehouse), Azure HDInsight (Hadoop distribution based on Hortonworks), Azure Databricks (Apache Spark-based analytics platform) and Azure Data Lake (big data store and analytics platform) as cloud services. In addition, it offers the Analytics Platform System, an MPP data warehouse appliance.

Strengths

- **LDW capabilities and vision:** With Azure Data Lake Storage, Azure Data Lake Analytics, Azure SQL Data Warehouse and Azure Databricks, Microsoft articulates a strong vision for the distributed processing environments inherent in the LDW. It provides a well-articulated approach for a path to production — from discovery and exploration in the data lake to optimization in the data warehouse.

- **Market execution and cloud focus:** Microsoft grew at twice the rate of the overall DBMS market in 2017. While Gartner does not break down the differences between operational and analytical uses of the solutions, Microsoft's strong market execution also applies to DMSA. Microsoft continues to benefit from its strong and early cloud focus. It is seen as one of the cloud leaders, and is a leading DMSA provider and strong competitor in the market for cloud-based DMSAs. Clients are not looking only at the capabilities of Azure SQL Data Warehouse, but at the overall set of data management and analytics services offered.

- **Customer loyalty:** Virtually all of the reference customers for Microsoft indicated that they plan to purchase additional licenses or capacity during the next 12 months. This further demonstrates that Microsoft clients value its products and roadmap.

Cautions

- **Performance satisfaction in the cloud:** A relatively high number of reference customers, most still running Gen1 architecture of Azure SQL Data Warehouse, indicated having faced performance issues with Azure SQL Data Warehouse, and that specific optimization and tuning is needed. The Gen2 architecture, which recently became generally available, provides

better performance, based on benchmarks and early customer use, so we expect these concerns to decrease as more customers complete the transition to Gen2.

- **Value for money and pricing flexibility:** Reference client scores for Microsoft for value for money placed it below the overall average for this Magic Quadrant, and pricing flexibility as average. With the increase in cloud adoption and the elasticity of Microsoft's solution, these results show that Microsoft needs to further help its clients with the predictability of costs and cost optimization. SQL Server customers should consider the Azure Hybrid Benefit, which allows them to transition on-premises licenses into the cloud — providing some license cost savings.

- **Product functionality and maturity:** Reference clients for Microsoft called out a number of product functionality and maturity issues, in particular for cloud products. They also highlighted the uneven product capabilities across on-premises and cloud.

Neo4j

Neo4j, which is based in San Mateo, California, U.S. and Malmö, Sweden, provides a graph platform that includes the Neo4j native graph DBMS, graph analytics, the Cypher graph query language, data integration, and graph visualization and discovery tools. The company offers the open-source Neo4j Community Edition; Neo4j Desktop, which is free for developers, startups and data scientists; and the paid-for Neo4j Enterprise Edition for production deployments. The company recently released Neo4j Bloom, which provides advanced graph visualization capabilities that enable both experienced and novice users to derive insights from graph processing. It also released Cypher for Apache Spark (CAPS), for deriving and analyzing graphs from Spark data, and has built a library of more than 20 in-database graph algorithms.

Strengths

- **Leader in graph:** Neo4j is generally seen to be the leader in graph DBMSs. The company has, arguably, done more than any other vendor to make graph processing easy to use and understand — most recently with Bloom, a graph visualization tool allowing even relative graph neophytes to get started with graph databases.

- **Value for money:** Neo4j's scores from its reference customers placed it in the top third of vendors in this Magic Quadrant for value for money. This reflects the somewhat unique nature of graph processing in driving new and innovative ways of analyzing data, compared with more traditional DMSA solutions.

- **Service and support:** Neo4j's reference customers scored it highly for the quality of, and experience with, its service and technical support.

Cautions

- **Limited use-case support for DMSA:** As a graph DBMS, Neo4j is not suitable for every DMSA use case. End users report the best success with well-defined use cases and clear business questions. Graph databases are particularly adept in analyzing highly interrelated sets of data

and are used for use cases such as fraud detection, recommendations engines, network analysis and master data management.

- **System availability:** Neo4j scored poorly with its reference customers for overall system availability. Respondents to our survey using Neo4j also report frequent updates to the product, which reflects the rapidly evolving capabilities that may sometimes change behavior. The vendor recently released rolling upgrade features to increase availability during upgrades.
- **Relatively small datasets:** Compared with other DMSA solutions, reference customers for Neo4j report relatively small datasets being used for analytics. All respondents to our survey using Neo4j reported data sizes of less than a terabyte. This may reflect the unique nature of graph databases, and how they store data compared with more traditional DMSA solutions.

Oracle

Oracle, based in Redwood Shores, California, U.S., provides Oracle Database 18c, Oracle Exadata Database Machine, Oracle Big Data Appliance, Oracle Big Data Management System, Oracle Big Data SQL and Oracle Big Data Connectors. In addition, the Oracle Cloud service provides Oracle Database Cloud Service, Oracle Database Cloud Exadata Service and Oracle Big Data Cloud Service, and the Oracle Autonomous Data Warehouse (ADW) Cloud. Oracle's cloud portfolio also includes on-premises solutions in the form of Oracle Database Exadata Cloud at Customer and Oracle Big Data Cloud at Customer.

Strengths

- **Market-leading product capabilities:** The Oracle Database has been one of the leading DBMS offerings in the market for many years, with robust capabilities honed by thousands of production use cases. Oracle received the highest score for product capabilities from its reference customers.
- **Autonomous data warehouse offering:** Oracle's ADW is a cloud service, offering not only reduced management overheads but also reduced effort to analyze performance issues and correct them.
- **Ready availability of implementation resources:** Oracle has a long history as the market share leader for DBMS. As a result, Oracle skills are widely available in the market. Customer reference scores for Oracle placed it near the top of the vendors for availability of third-party resources, ease of integration with standard APIs and tooling, overall integration and deployment.

Cautions

- **Pricing and licensing:** Although Oracle's customer reference scores for value for money increased significantly compared with last year, users of Gartner's client inquiry service indicate that Oracle's pricing and licensing practices continue to be poorly thought of. Further, Oracle's customer reference scores placed it in the bottom half of the vendors in this Magic Quadrant for pricing and contract flexibility. The vendor expects its customers' perception of

pricing and licensing to improve as more of them adopt cloud services, which are generally priced more competitively.

- **Historical lack of small enterprise and developer outreach:** A significant part of the growth of the DMSA market is the new systems created by developers for departments or smaller enterprises. Oracle's traditional strength in the enterprise has not yet translated to this area, since most of its sales force is oriented toward large enterprise customers. With the launch of ADW in Oracle's cloud, the vendor expects to gain more traction with small enterprises due to the reduced operational footprint.

- **Late to the cloud:** While ADW is a good cloud offering for Oracle, competitors such as AWS, Google and Microsoft have had cloud services in this area for many years, capturing customers and gaining their loyalty. Oracle's four Gen 2 cloud data centers, which support ADW, are a relatively recent offering and are not available in as many geographies as those of the major cloud competitors, which may limit options for adjacent product deployment. In 2019, Oracle plans to launch three new Gen 2 data centers in North America, four in Asia/Pacific, two in Europe and one in South America.

Pivotal

Pivotal, which is based in San Francisco, California, U.S., offers the Pivotal Greenplum database — an open-source MPP database based on PostgreSQL. It is available both as software and in the cloud, on either AWS or Microsoft Azure infrastructure. Pivotal and Dell have also partnered to provide the Greenplum Building Block Solution for those customers looking to deploy Pivotal Greenplum in an appliancelike form factor.

Strengths

- **Robust in-database analytics:** With the Apache MADlib analytics libraries, Pivotal Greenplum has capable in-database analytics that allow for predictive modeling and ML to be applied to relational data.

- **Performance, scalability and open source:** Reference customers for Pivotal praised the overall performance and scalability of Pivotal Greenplum, and frequently called out the open-source alignment with PostgreSQL as a strong and cost-effective positive.

- **Asia/Pacific expansion:** Pivotal Greenplum has shown strength in Asia/Pacific markets; most notably in China, where the product remains popular and is competitive with locally developed alternatives. The open-source Pivotal Greenplum database is the basis for Alibaba Cloud's HybridDB for PostgreSQL.

Cautions

- **Limited cloud offerings:** Reference customers for Pivotal expressed frustration with the lack of maturity and enterprise readiness of its public cloud offerings.

- **Deep technical skills required to gain value:** Compared with some of the newer offerings in the market, reference customers for Pivotal report that Pivotal Greenplum requires deeper technical engagement to get value from the product. The most successful implementations were those where technical staff are prepared to be very hands-on.

- **Workload management and system availability:** Reference customers for Pivotal reported challenges with managing complex mixed workloads. For overall system availability, Pivotal's reference scores placed it near the bottom of all the vendors in this Magic Quadrant. This may, in part, be because Pivotal Greenplum is often used in mission-critical use cases, where downtime is not well-tolerated.

SAP

SAP is based in Walldorf, Germany. It offers SAP HANA, an in-memory column-store DBMS that supports operational and analytical use cases. There is also SAP BW/4HANA, a packaged data warehouse solution. Both are offered as cloud solutions (for deployment in public and private clouds, and on SAP Cloud Platform), as stand-alone software, and as an appliancelike hardware reference architecture. SAP also offers SAP Cloud Platform Big Data Services, a cloud-based Hadoop distribution, and SAP Vora (offered within SAP Data Hub) for Spark and Hadoop processing.

Strengths

- **Multicloud focus:** Throughout 2018, SAP has been aggressively expanding its cloud partnerships with all major cloud service providers (CSPs) such as AWS, Google Cloud Platform and Microsoft Azure, but also with China-based CSPs such as Alibaba Cloud and Huawei. This multicloud strategy could prove to be differentiating over time — as organizations increasingly demand cloud-agnostic solutions in order to avoid cloud lock-in and to support multicloud deployments.

- **ML and AI focus:** SAP has shown a strong focus around ML/AI within SAP HANA with, for example, the ability to run TensorFlow algorithms. SAP also plans to leverage ML/AI to simplify the administration and tuning of SAP HANA in the coming years.

- **Performance:** SAP's reference customers continue to praise SAP HANA's performance and scalability. Continued satisfaction in performance is not a "given" in a market that is constantly setting higher levels of expectation.

Cautions

- **Pricing and packaging:** Although SAP has made some changes in pricing and packaging in 2018, some reference clients still think it's expensive. SAP's reference scores for value for money were below the average for this Magic Quadrant.

- **Cloud elasticity:** While SAP has expanded its cloud partnerships and cloud offerings, it still lacks true elasticity. While storage can be expanded, compute cannot be elastically increased or reduced dynamically over short timescales.

- **Technical support:** Some of SAP's reference clients continue to voice their concerns with its customer support, and to score it well below the overall average for this Magic Quadrant.

Snowflake

Snowflake, which is based in San Mateo, California, U.S., offers a fully managed data warehouse as a service on AWS and Microsoft Azure infrastructure. It supports ACID-compliant relational processing, as well as native support for document store formats such as JSON, Avro, Optimized Row Columnar (ORC), Parquet and XML. A native Apache Spark connector, R integration, support for user-defined functions, dynamic elasticity, temporal support and data-sharing capabilities round out the core offering. Recently announced partnerships with Qubole and Databricks extend Snowflake's reach to exploratory data lake use cases.

Strengths

- **Customer experience:** Snowflake's customer reference scores for overall experience place it near the top of the vendors in this Magic Quadrant. Users praised the product capabilities, value for money, pricing and contract flexibility, and overall ease of deployment.
- **Dynamic elasticity capabilities:** Snowflake's modern cloud architecture is built around the separation of resources, which allows it to scale effectively and efficiently in response to mixed and dynamic workloads.
- **Operational efficiency:** Customer references for Snowflake report being able to run more workloads, and support more use cases than they were able to do with their previous platform, often with fewer resources.

Cautions

- **Some features are lacking:** Snowflake has been generally available for less than four years. Some customer references called out the lack of features such as materialized views and stored procedures, and a relatively immature web-based administrative user interface. However, the vendor is actively working to address these gaps. Materialized views are now generally available, and stored procedures are currently in preview, though not yet generally available.
- **Hypergrowth:** Snowflake is in the midst of a period of hypergrowth, and has grown its customer base to well over 1,000 organizations since it became generally available in 2015. It may be challenging for the organization to continue to provide the same level of customer engagement that its customers have come to expect.
- **Training resources and support:** Snowflake's customer reference scores placed it in the bottom half of vendors in this Magic Quadrant for the overall quality of training resources and support experience. These were the only two categories in which Snowflake's score did not place it in the top half of the vendors evaluated, and even for these, the scores were within the standard deviation from the average.

Teradata

Teradata is based in San Diego, California, U.S. and delivers data management solutions for analytics across any deployment environment — cloud, on-premises and hybrid. Teradata's offerings include a software-only analytics platform with an underlying SQL engine, ML engine, and graph engine; the Teradata IntelliFlex and IntelliBase appliances; and business and analytic consulting services. Teradata IntelliCloud is an "as a service" cloud offering available on public cloud infrastructure (AWS and Microsoft Azure) and the Teradata Cloud (optimized infrastructure). Support for the LDW comes in the form of Teradata's Unified Data Architecture (UDA). Teradata QueryGrid (part of the UDA) provides multisystem query support via Teradata's own software, as well as via open-source Presto. Teradata also offers Hadoop support for Cloudera and Hortonworks distributions. In October 2018, Teradata announced new packaging and branding for its analytics platform under the Vantage name.

Strengths

- **Leading technology:** Teradata has had market leading technologies for years, and continues to be one of the leading best-of-breed solutions. According to its customer reference scores, Teradata sits in the top third of the vendors in this Magic Quadrant for product capabilities, service and support, technical support, and system availability. This reflects a mature product offering with both deep and broad capabilities.

- **Simplified portfolio and company rebranding:** Teradata is in the early stages of a comprehensive company rebranding. This includes a significantly simplified portfolio with only two appliance offerings (IntelliFlex and IntelliBase), private and public cloud deployment options with IntelliCloud, and a single software stack with Vantage. The software is available to run in any deployment environment. It has a common pricing metric that is portable between environments — including on-premises on Teradata's hardware appliances or via software only, and in major public cloud providers such as AWS and Microsoft Azure.

- **Large and complex workload capabilities:** Customer reference scores for Teradata place it near the top of all the evaluated vendors for workload management and for the highest number of concurrent users.

Cautions

- **Focus on high-end, enterprise workloads:** Teradata has demonstrated its ability to handle the largest enterprise workloads, but these advantages may not be as important among lower-end workloads. Also, increasingly capable competitors are often perceived to be "good enough." These trends will have the effect of pushing Teradata's offerings to the high end of the market, where its technology advantages continue to maintain a competitive advantage.

- **Limited market growth:** Teradata's focus on the high-end market has limited its growth in the broader market with lower-end workloads, where much of the market growth is taking place. Also, the general perception in the market remains — Teradata is not seen as a cloud vendor and users of Gartner's client inquiry service often ask about alternative solutions that may be more cost-effective, even if they are not as capable. Teradata's multicloud strategy, flexible

pricing options and simplified portfolio are working to address this, but the vendor's aggressive rebranding effort will need to be successful in changing market perceptions if this trend is to be reversed.

- **Pricing and contracts:** Respondents to our customer reference survey scored Teradata below average on overall experience, pricing and contract flexibility, and value for money. This was the second consecutive year of below-average scores for customer satisfaction and account management, which shows that the market has not yet accepted Teradata's new branding and focus as a modern DMSA vendor. Its concerted rebranding effort has only recently launched, so we may see an improvement during the coming year.

Vendors Added and Dropped

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

Added

- Arm (Treasure Data), following its acquisition by Arm's parent company SoftBank.

Dropped

- Actian, which did not meet the inclusion requirements for revenue.
- MemSQL, which did not meet the inclusion requirements for revenue.
- Qubole, which is a data science exploration platform, rather than a DMSA.
- Treasure Data, which, following its acquisition by Arm's parent company, now appears as Arm (Treasure Data).

Inclusion and Exclusion Criteria

The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research:

- Vendors must have had DMSA software generally available for licensing, or supported for download, for approximately one year (since 1 December 2017). We do not consider beta releases.
- We use the most recent release of the software to evaluate each vendor's current technical capabilities. For existing solutions, and direct vendor customer references and reference survey responses, all versions currently used in production were considered. For older

versions, we considered whether later releases may have addressed reported issues, but also the rate at which customers have or have not moved to newer versions.

- Product evaluations included technical capabilities, features and functionality present in the product or supported for download on 1 December 2018. Capabilities, product features or functionality released after this date could be included at Gartner's discretion and in a manner Gartner deemed appropriate to ensure the quality of our research product on behalf of our nonvendor clients. We also considered how such later releases might reasonably impact the end-user experience.
- Vendors should provide 30 verifiable DMSA production implementations that will exhibit generated revenue from distinct organizations, indicating they are in production, and:
  - A minimum of $40 million in revenue with a 50% growth rate year over year
  - OR
  - More than $70 million in revenue.
  - (Revenue can be from licenses, support and/or maintenance.)
  - The production customer base must include customers from three or more vertical industries (see Note 2)
  - Customers in production must have deployed DMSAs that integrate data from at least two operational source systems for more than one end-user community (such as separate business lines or differing levels of analytics).
  - Vendor must demonstrate production customers from at least two distinct geographic regions. This means at least 10% (assessed by customer count or revenue percentage) of the verified production customer base must be outside of the vendor's home geography (see Note 3).
- Any acquired product must have been acquired and offered by the acquiring vendor as of 30 June 2018. Acquisitions after 30 June 2018 will be considered under their preacquisition identity, if appropriate, and represented by a separate dot until publication of the following year's Magic Quadrant.
- Support for the included DMSA products had to be available from the vendor. We also considered products from vendors that control, or contribute specific technology components to, the engineering of open-source DBMSs and their support.
- We included in our assessments the capability of vendors to coordinate data management and processing from additional sources beyond the evaluated DMSA. However, vendors in

this Magic Quadrant need to offer significant value-added capabilities beyond simply providing an interface to data stored in other sources.

- Vendors must provide support for at least one of the four major use cases (see Note 1).
- Depth of processing capabilities and variety of analytical processing options (relational and nonrelational) are considered as advantageous in the evaluation criteria.
- Vendors participating in the DMSA market had to demonstrate their ability to deliver the necessary services to support a data warehouse through the establishment and delivery of support processes, professional services and/or committed resources and budget.
- Products that exclusively support an integrated front-end tool that reads only from the paired data management system did not qualify for assessment in this Magic Quadrant.
- We also consider the following capabilities when deciding whether products were eligible for inclusion:
  - Relational DBMS
  - Nonrelational DBMS
  - Hadoop distributions
  - No specific rating advantage is given with regard to the type of data store used (for example, relational DBMS, graph DBMS, HDFS, key value DBMS, document DBMS, wide column DBMS)
  - Multiple solutions used in combination to form a DMSA were considered valid, but each solution must demonstrate maturity and customer adoption
  - Cloud solutions are considered viable alternatives to on-premises solutions. The ability to manage hybrid on-premises and cloud solutions is considered advantageous for inclusion
  - Open-source solutions
- Gartner may include, at its discretion, additional vendors in cases of known use for classified but unspecified cases.
- The following technology categories are specifically excluded:
  - BI and analytical solutions that only offer a DMSA that is embedded or that embeds a DMSA from another provider
  - BI and analytical solutions that only offer a DMSA that is limited specifically to the vendor's own BI and analytical solution, or whose customers exhibit only using the solution within the same vendor stack

- In-memory data grids
- Query service engines
- Prerelational DBMS
- Object-oriented DBMS

- Gartner analysts are the sole arbiters of which vendors and products are included in this Magic Quadrant.

Evaluation Criteria

Ability to Execute

The criteria for Ability to Execute are primarily concerned with vendors' capabilities and maturity. These criteria also consider products' portability and the ability to scale and run in different operating environments, which gives the customer a range of options.

These criteria are critical to customers' satisfaction and success with a product, so interviews with and survey responses from reference customers are weighted heavily throughout.

Product or Service: This criterion assesses vendors in light of increasingly divergent market demands — ongoing traditional, logical data warehousing, operational data warehousing and context-independent processing approaches to data management for analytics. The largest and most traditional portion of the analytics and data warehouse market is still dominated by the demand to support relational analytical queries over normalized and dimensional models (including simple trend lines through complex dimensional models). Data management for analytics solutions are increasingly expected to include repositories, semantic data access (such as federation/virtualization) and distributed processing in combination — referred to in the market as logical data warehouses. All traditional demands of the data warehouse remain. The real time data warehouse use case also exhibits traditional requirements, plus the ability to accommodate streaming data, real-time data loading and real-time analytics support. Users expect solutions to become self-tuning, to reduce the staffing required to optimize the data warehouse, especially as mixed workloads increase. Context-independent warehouses (CIWs) do not necessarily support mixed workloads (but can), nor do they typically require the same level of mission-critical support. CIWs serve more in the role of data discovery support, data science initiatives or "sandboxes." CIWs are expected to meet the demands of ad hoc queries and varied processing options such as Python, ML, R or graph. They may also include the ability to process and analyze nonrelational data types (text, audio, video, and others) and combine this analysis with relational data. In-database analytic capabilities and the ability to move analytic models from CIWs to traditional or real-time models are also considered, as are flexibility of deployment options (cloud, on-premises, hybrid).

Overall Viability: This criterion includes corporate aspects, such as the skills of the personnel, financial stability, continuous profitability, market share trends, R&D investment, overall

management of an organization, and the expected persistence of a technology during merger and acquisition activity. It also covers the company's ability to survive market difficulties (crucial for long-term survival). Vendors are further evaluated on their capability to establish dominance in meeting one or more discrete market demands.

Sales Execution/Pricing: For this criterion, we examine the price/performance and pricing models of the DMSA, and the ability of the sales force to manage accounts (judged by the feedback from our clients and feedback collected through the reference survey). We also consider the market share of DBMS software, including trends of growth or reduction of market share. Also included is the diversity and innovative nature of packaging and pricing models, including the ability to promote, sell and support the product within target markets and around the world.

Market Responsiveness/Record: This criterion is based upon the concept that market demands change over time and track records are established over the lifetime of a provider. The availability of new products, services or licensing in response to more recent market demands, and the ability to recognize meaningful trends early in the adoption cycle, are particularly important. The diversity of delivery models, as demanded by the market, is also considered an important part of this criterion (for example, its ability to offer dbPaaS, software solutions, data warehouse "as a service" offerings or certified configurations). We draw on multiple sources to assess market mind share, including Gartner inquiry volume, press presence and search trends.

Marketing Execution: This criterion includes the ability to generate and develop leads, channel development through internet-enabled trial software delivery, and partnering agreements (including co-seller, co-marketing and co-lead management arrangements). Also considered are the vendor's increasing or decreasing participation in competitive situations, ability to expand footprint within their customer base, and ability to sign new customers to expand the overall customer base. We also consider ratios of license sales to support and maintenance revenue (where appropriate) as a measure of footprint expansion.

Customer Experience: This criterion is based on customer reference surveys and discussions with users of Gartner's inquiry service during the previous six quarters. Also considered are the vendor's track record on proofs of concept, customers' perceptions of the product, and customers' loyalty to the vendor (this reflects their tolerance of its practices and can indicate their level of satisfaction). This criterion is sensitive to year-over-year fluctuations in the customer experience surveys. Additionally, customer input regarding the application of products to limited use cases can be significant, depending on the success or failure of the vendor's approach in the market.

Operations: This criterion evaluates the alignment of the vendor's organization, as well as whether and how this enhances its ability to deliver. This criterion considers a vendor's ability to support clients throughout the world, around the clock and in many languages. Anticipation of regional and global economic conditions is also considered.

Table 1: Ability to Execute Evaluation Criteria

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

Source: Gartner (January 2019)

Completeness of Vision

The criteria for Completeness of Vision assess a vendor's ability to understand the functional capabilities needed to support DMSA environments. Also, its ability to develop a product strategy that meets the market's requirements, to comprehend overall market trends, and to influence or lead the market when necessary. A visionary leadership role is necessary for long-term viability of both products and companies. A vendor's vision may be demonstrated — and improved — by a willingness to extend its influence throughout the market by working with independent third-party application software vendors that deliver additional functionality for its DMSA environment. A successful vendor will be able not only to understand the competitive landscape for DMSAs, but also to shape its future.

Market Understanding: This criterion covers a vendor's ability to understand the market and shape its growth and vision. It examines a vendor's core competencies in this market. It also considers awareness of new trends, such as the increased demand from end users for mixed data management and access strategies that match the growing variety of skills and roles. Likewise, it considers the changing concept of the data warehouse and analytics data management, including strategies for metadata management and distributed data management; and a vendor's position regarding emerging technology such as data lakes and multimodel DBMSs. Understanding the different audiences for various categories of data, and associated contexts for data, as described in Gartner's Data and Analytics Infrastructure Model (DAIM; see Note 4) is crucial. Also crucial, is a demonstrable track record for altering strategy and tactical delivery in response to both opportunistic segments in the market and the broader market trends.

Marketing Strategy: This criterion considers a vendor's marketing messages, product focus, and ability to choose appropriate target markets and third-party software vendor partnerships to

enhance the marketability of its products. It covers a vendor's responses to the market trends identified above, and any offers of alternative solutions in its marketing materials and plans. An understanding of current product focus, and how or if it may need to change to address future market requirements, is also deemed critical.

Sales Strategy: This criterion encompasses all plans to develop or expand channels and partnerships that assist with selling. Sales strategy is especially important for young organizations as it can enable them to greatly increase their market presence while maintaining lower sales costs (for example, through co-selling or joint advertising). This criterion also covers a vendor's ability to communicate its vision to its field organization and, therefore, to clients and prospective customers. Of particular interest are pricing innovations and strategies, such as new licensing options and flexibility — particularly in support of cloud, on-premises and hybrid deployments. Also important is the ability to support different pricing models that align with different kinds of workloads (exploratory versus production, for example). And, finally, the ability to apply pricing in a consistent and predictable manner to multiple deployment environments, and the availability of freeware and trial software.

Offering (Product) Strategy: This criterion is clearly distinguished from product execution. It evaluates the roadmap for enhancing capabilities across all four primary use cases (see Note 1). It also includes expected functionality and assesses timetables for meeting new market demands — as manifested in roadmaps and development plans for:

- Support of varied levels of data latency, with a growing focus on streaming and continuous data ingestion and real-time access for analysis
- Support for multiple data types, including a semantic design tier and metadata management capabilities
- System and solution auditing and health management to ensure use-case SLA compliance
- Static and dynamic cost-based optimization, with the potential to span processing environments, data structures and storage options
- Management and orchestration of multiple processing engines
- Elastic workload management and process distribution across cloud and on-premises; this includes separation of processing and storage
- Support for a "best fit" engineering approach. There has to be support for an open approach (enabling easy combination of technologies from different vendors), as an alternative to an integrated approach (demonstrating value from vendor stack integration) — or both approaches in combination
- Leveraging ML and AI in support of optimization, performance, tuning and maintenance

Business Model: This criterion evaluates how a vendor's model of a target market combines with its products and pricing, and whether the vendor can generate profits with this model — judging by its packaging and offerings. We consider reviews of publicly announced earnings and forward-looking statements relating to an intended market focus. For private companies, and to augment publicly available information, we use proxies for earnings and new customer growth — such as the number of Gartner clients indicating interest in, or awareness of, a vendor's products during calls to our inquiry service.

Vertical/Industry Strategy: This criterion assesses the vendor's ability to understand its clients. A measurable level of influence within end-user communities and certification by vertical industry standards bodies are of importance here. A product or solution roadmap to support a specific industry is advantageous.

Innovation: This criterion assesses a vendor's development of new functionality, allocation of R&D spending, and leading of the market in new directions. This criterion also covers a vendor's ability to innovate and develop new functionality for accomplishing data management for analytics. Also addressed is the maturation of alternative delivery methods such as cloud infrastructures, as well as solutions for hybrid premises-cloud and cloud-to-cloud data management support. A vendor's awareness of new methodologies and delivery trends — such as flexible pricing models and distributed data management — is also considered. Organizations are increasingly demanding data storage strategies that balance cost with performance optimization, so solutions that offer separation of compute and storage or that address the age and "temperature" of data will become increasingly important.

Geographic Strategy: This criterion considers the vendor's ability to address customer demands in different regions of the world using direct/internal resources or in combination with subsidiaries and partners. It also evaluates a vendor's global reach and roadmap for addressing specific geographic regulatory requirements, particularly for cloud deployments. Significant presence or growth of customers in multiple geographic regions will be advantageous.

Table 2: Completeness of Vision Evaluation Criteria

Evaluation Criteria ↓	Weighting ↓
Market Understanding	Medium
Marketing Strategy	High
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	Low

Evaluation Criteria ↓	Weighting ↓
Vertical/Industry Strategy	Low
Innovation	High
Geographic Strategy	Medium

Source: Gartner (January 2019)

Quadrant Descriptions

Leaders

The Leaders quadrant includes a mix of traditional large vendors that have, in general, adapted to the changing market conditions which continue to drive the DMSA market. All of them have a cloud strategy, and all of them have a vision that allows them to address the broader DMSA market beyond traditional data warehousing. Notably, each vendor in the Leaders quadrant has a credible, well-developed strategy for addressing all four defined DMSA use cases, as well as breadth of coverage as defined in Gartner's DAIM (see Note 1 and Note 4).

Within the Leaders quadrant, there is a significant spread of scores in both vision and execution. This reflects different strengths for each vendor regarding where they are focusing their effort and attention. In most cases, the perennial Leaders have capitalized on the "foundational core" strengths, while simultaneously addressing new market demands for innovative pricing models, new deployment models such as cloud, and an increased scope that includes a modern DMSA platform.

New entrants to the Leaders quadrant this year exhibit a strong vision, as well as success in executing within this market — as reflected in their customer growth, retention and market mind share.

Challengers

The absence of Challengers in this year's Magic Quadrant highlights the increased split in the market between the Leaders cohort and the Niche Players cohort. In essence, none of the Niche Players has executed well enough in the market to raise them into the Challengers quadrant. We expect this split to become even more pronounced during the coming years, as Leaders solidify their strengths and Niche Players focus on an increasingly small subset of the market.

Visionaries

What differentiates a Visionary from a Leader is a combination of market visibility and market acceptance of a differentiated and unique vision. In the former case, the Visionaries have not executed sufficiently well to generate the sustained market mind share and momentum to raise them into the Leaders quadrant. In the latter case, the nature of being a Visionary is, by definition, not necessarily aligned with mainstream market thinking. Visionaries show tremendous potential to become tomorrow's Leaders. However, that potential will only be

realized if they are able to both articulate the vision to the market and create widespread acceptance of that vision as a new best practice that can serve as a foundation for a broader DMSA strategy.

Niche Players

The crowded Niche Players quadrant consists of vendors that are executing well within a specific use case. In general, these vendors do not address the full scope of defined use cases for DMSA, nor do they meaningfully cover all of the contexts articulated in Gartner's DAIM (see Note 4). Within the scope of their defined target use cases, they remain strong players that are well worth considering. Beyond the scope of their defined target use cases, however, these vendors will struggle to provide a comprehensive and broad solution. Other factors that may contribute to a vendor's placement in the Niche Players quadrant include limited global presence, and limited market mind share, presence and acceptance. Some Niche Players have made forays into adjacent quadrants (Challengers, Visionaries) in past years, only to pull back into the Niche Players quadrant as the market developed expectations that were beyond the scope of many of their solutions. Some of these vendors may evolve to adjacent quadrants in the future, and some may eventually become Leaders; the majority will not.

Context

This year's Magic Quadrant presents two logical cohorts of vendors. The placement of the various vendors shows two distinct groups as the Leaders and the lone Visionary distance themselves from the Niche Players. Within the Leaders quadrant, there has been significant movement and increased spread. Oracle, the overall Leader in both vision and execution, has distanced itself from the rest of the pack with the release of the Autonomous Data Warehouse. While its public cloud offerings remain behind those of AWS and Microsoft Azure, the continued investment in products built and architected for cloud is starting to have a positive effect. Oracle's cloud is, however, less open than those of its competitors, and seems tailor-made for a unique Oracle experience.

AWS and Microsoft maintain strong positions in the Leaders quadrant as cloud adoption drives market growth for data management. Both have strong vision and are executing well in the market. SAPs renewed focus on providing a more general-purpose solution (rather than one limited to the SAP ecosystem) is also starting to have an effect, though the company has some way to go in making this a reality.

Newcomers to the Leaders quadrant this year include Snowflake and Google. Snowflake continues to gain momentum and customers; Google's continued focus on enterprise sales, and as one of the big three cloud vendors, is beginning to show some traction. As Google continues to hone its offering and messaging to align with specific verticals, such as retail, we expect continued progress.

Two perennial Leaders — IBM and Teradata — have struggled to maintain their market positions in recent years. IBM's transition from Netezza-based technology to Db2-based technology has met with a mixed reaction from the customer base. Many customers are using the transition as

an opportunity to re-evaluate their strategy, with some choosing alternative platforms to the ones IBM has offered. As noted in last year's Magic Quadrant, IBM's offerings for the foundational core remain less flexible and agile than those of emerging competitors, and IBM's cloud is rarely mentioned by Gartner clients embarking on strategic cloud initiatives. IBM's portfolio, while broad and capable, remains confusing to clients. Teradata remains a leader in technical product capabilities, but has struggled to gain market traction as it makes the transition to new cloud deployment models. While Teradata's offerings are universally regarded as extremely capable, the vendor is still trying to shed the perception of a complex, expensive vendor grounded in the traditional data warehouse space. The recently announced rebranding of the company may help, but it remains to be seen how and if the market will respond.

The lone Visionary this year — Marklogic — is logically grouped with the cohort of Leaders. New cloud offerings, with an innovative pricing model, should help accelerate adoption over the coming year, but Marklogic's frictionless integration value proposition in support of an analytic data hub remains difficult for customers to fully understand.

The Niche Players quadrant contains multiple logical cohorts. The Hadoop cohort consists of Cloudera, Hortonworks, and MapR. The first two of these are in the midst of a merger, but the challenges that face any individual Hadoop vendor remain for a single dominant Hadoop vendor. These challenges include difficulty in consistently demonstrating the ability to address traditional data warehousing workloads. In addition, there is strong competition from native cloud offerings covering similar use cases that call into question the ability of these vendors to credibly make the transition to cloud.

A second Niche Players cohort consists of the emerging China-based vendors — Alibaba Cloud, GBase and Huawei. Each of these vendors has met with strong success in their home Asia/Pacific market. Each has global aspirations, and each is experiencing a different level of success as they work to expand their presence to overseas markets. The current geopolitical climate in North America is not making their task any easier. Their products are generally capable and well worth consideration for those looking for alternatives to North American and European mainstream offerings, but the increased complexity in international regulations may place constraints on the vendor selection process for some clients. These constraints apply to regulatory controls in North America as well as in the European Union, and globally, and have an impact on product offerings from vendors around the world — not just those based in China.

The remainder of the Niche Players quadrant includes highly specialized vendors such as Neo4j, and vendors that have emerged from a strong vertical focus, such as ARM Treasure Data. Finally, there are the traditional data warehouse vendors that have continued to focus on their traditional markets, such as Micro Focus and Pivotal.

Market Overview

The DMSA market continues to push toward distributed data management; this is inherent in the LDW architecture. While point solutions characterized by "best fit" engineering principles remain popular, especially in the cloud, these require data and analytics leaders to engage in

architectural and design decisions that will enable them to realize value from the LDW. This change is manifesting itself in several ways:

- **Platform plays challenge best-fit approaches —** Larger vendors with the resources and portfolio depth required to manifest platform plays are starting to challenge the best-fit approaches championed by smaller vendors with niche product offerings.
- **Best-fit and platform combine in the cloud —** While the cloud is characterized by best-fit point solutions, the cloud ecosystem and infrastructure can serve as the basis for a platform play. This applies to native CSP product offerings as well as point solutions from independent software vendors.
- **Expansion beyond core data management —** Small and large vendors alike are starting to expand their product capabilities to integrate metadata management, data integration, governance, ML for optimization and performance management, and other aspects required for long-term strategic success.

Building on the above, Gartner notes the following key trends in this market:

- **The end of disruption —** Large, established vendors are rediscovering their way with refreshed product offerings that build on their core strengths and capabilities. The new disruptive entrants to the market — including cloud leader AWS — will have to battle these established vendors where they are strong. In other words, cloud and nonrelational technologies are no longer the disruptive forces that they once were, but established components of the DMSA market that support and augment the foundational core.
- **Rediscovery —** As disruption ends, the large traditional vendors are rediscovering their core strengths and value propositions. Oracle is moving to the cloud on a foundation of Oracle Database and Exadata. Microsoft is building on its DMSA offerings with a sound integrated vision. SAP is pushing toward expansion for general-purpose use that goes beyond the core SAP ecosystem. Teradata is rebranding and attempting to reset market perceptions while capitalizing on the deep technical capabilities that served as the basis for past successes. Along with these changes, there is the resurgence of traditional relational data warehousing as the basis for a DMSA solution.
- **Niche gets more niche —** With leading vendors showing strong progress in areas where they were previously lacking, most Niche Players are doubling down on their core strengths. While these capabilities are generally differentiating, and may provide a perfect match to a given use case, they also lack the depth and breadth to compete across all defined DMSA use cases and across all DAIM contexts. This is highlighted by the expanding gap between the Niche Players and Leaders, and the complete absence of Challengers in this year's Magic Quadrant.

Acronym Key and Glossary Terms

ACID	atomicity, consistency, isolation and durability
AI	artificial intelligence
AWS	Amazon Web Services
BI	business intelligence
CSP	cloud service provider
DAIM	Data and Analytics Infrastructure Model
dbPaaS	database platform as a service
DMSA	data management solution for analytics
IoT	Internet of Things
JSON	JavaScript Object Notation
LDW	logical data warehouse
ML	machine learning
MPP	massively parallel processing

Evidence

Our analysis is based on information gathered from interactions with Gartner clients during the 12 months to October 2018, and our survey of the vendors' reference customers (see below).

We also took account of:

- Earlier information and any news about vendors' products, customers and finances that came to light during the time frame for our analysis.
  - Information gathered on Alibaba Cloud included the following references:
  - "Alibaba Pulls Back in U.S. Amid Trump Crackdown on Chinese Investment," (https://www.bloomberg.com/news/articles/2018-06-27/alibaba-pulls-back-in-u-s-amid-trump-crackdown-on-chinese-investment) Bloomberg.

- "Alibaba Puts the Brakes on U.S. Cloud Expansion," (https://www.theinformation.com/articles/alibaba-puts-the-brakes-on-u-s-cloud-expansion) The Information.

- The findings in "Market Share: Enterprise Infrastructure Software, Worldwide, 2017."

Survey of Vendors' Reference Customers

As part of the Magic Quadrant research process, we sought the views of vendors' reference customers (details of whom were supplied by the vendors) via a 35- to 40-minute online survey conducted during September and October 2018. The survey included requests for feedback about:

- Vendors' product capabilities — For example, support for large datasets, high concurrency workloads, analytics capabilities, LDW support, data ingest rates and problems encountered with the products.
- Vendors' maturity — For example, support for defined DMSA use cases, ability to support customers, account management, overall perception of customers for experience of doing business with the vendor, pricing, ease of deployment and technical support.

A total of 601 references from 23 vendors completed the survey. More than 540 organizations, representing all the featured vendors' customers, responded to the survey with an average of 26 respondents per vendor. The breakdown of deployments by geography was:

- Asia/Pacific — 41%
- Europe, the Middle East and Africa — 27%
- Latin America — 5%
- North America — 49%

Note that the geographic breakdown above does not sum to 100%, because some deployments took place in multiple geographic regions.

The respondents were generally pleased with their vendors and products, but gave relatively low marks in some areas, which we detail in the analysis of each vendor. Some low scores might reflect historical problems, because not all organizations are on the latest product versions.

Gartner's Client Inquiry Service Data

Gartner maintains an extensive database of information about all inquiries to our client inquiry service. Our data management team received more than 4,400 inquiries from end-user clients during the Magic Quadrant research period of November 2017 through October 2018. We used

the sentiments apparent from these inquiries to assist in formulating the opinions expressed in this Magic Quadrant.

Note 1
DMSA Use Cases

Traditional Data Warehouse

This use case involves managing structured historical data coming from multiple sources. Data is mainly loaded through bulk and batch loading.

The traditional data warehouse use case can manage large volumes of data and is primarily used for standard reporting and dashboarding. To a lesser extent, it is also used for free-form ad hoc querying and mining, or operational queries. It requires high levels of capability for system availability and administration and management, given the mixed workload capabilities for queries and user skills' breakdown.

Real-Time Data Warehouse

This use case adds a real-time component to analytics use cases, with a goal of reducing latency between when data is generated and when it can be analyzed. It primarily manages structured data that is loaded continuously via microbatching and/or streaming ingest analytics in support of real-time decision support, embedded analytics in applications, real-time data warehousing and operational data stores.

This use case primarily supports reporting and automated queries, in order to support operational needs or low latency decision support, and will require high-availability and disaster recovery capabilities to meet operational demands. Managing different types of users or workloads — together with the ability to store large volumes of historical data — will be of less importance. This is because the major driver here is to provide a low-latency, real-time view of, and analytics on, operational data.

Context-Independent Data Warehouse

This use case allows exploration of new data values, variants of data form and new relationships. It supports search, graph and other advanced capabilities for discovering new information models.

This use case is primarily used for free-form queries to support forecasting, predictive modeling or other mining styles, as well as queries supporting multiple data types and sources. It has no operational requirements and favors advanced users such as data scientists or business analysts, resulting in free-form queries across potentially multiple data types.

Logical Data Warehouse

This use case manages data variety and volume of data for both structured and other content data types where the DMSA acts as a logical tier to a variety of data sources.

Besides structured data coming from transactional applications, this use case includes other content data types such as machine data, text documents, images and videos. Because additional content types can drive large data volumes, and have specific data persistence requirements, access to data in disparate repositories is an important criterion. The LDW is also required to meet diverse query capabilities and support diverse user skills. This use case supports queries reaching into other sources than the data warehouse DBMS alone, and may include metadata or data virtualization components.

Note 2
Vertical Industry Sectors

- Accommodation and food services
- Administrative and support, and waste management and remediation services
- Agriculture, forestry, fishing and hunting
- Arts, entertainment and recreation
- Construction
- Educational services
- Finance and insurance
- Healthcare and social assistance
- Information
- Management of companies and enterprises
- Manufacturing
- Mining
- Professional, scientific and technical services
- Public administration
- Real estate rental and leasing
- Retail trade
- Transportation and warehousing
- Utilities
- Wholesale trade

Note 3
Geographic Regions

- North America (Canada and United States)
- Latin and South America (including México)
- Europe (Western and Eastern Europe)
- Middle East and Africa (including North Africa)
- Asia/Pacific (including Japan)

Note 4
Data and Analytics Infrastructure Model (DAIM) Contexts

The four sectors of the Gartner Data Analytics and Infrastructure Model (see “Solve Your Data Challenges With the Data Management Infrastructure Model”) align with core business needs established through these known and unknown characteristics:

- **Known data/known business questions —** This represents the foundational core of the business. The business problems are known and the sources of data that support their resolution are well-established.
- **Unknown data/unknown business questions —** This is the realm of exploration and discovery. The business value of the data, and therefore the questions it can answer, has yet to be established.
- **Unknown data/known business questions —** In this sector, the value of data has partially been established, in that there is an accepted understanding of the questions it can answer. However, the final sources of insight to support these questions have not yet been established, including the potential for a wide range of emerging external/exogenous data sources (such as open data, data brokers, social data, personal data, and so on). This is where value is established.
- **Known data/unknown business questions —** This sector represents further exploration of known data — What other uses can this data support?

Evaluation Criteria Definitions

Ability to Execute

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

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

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

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

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

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

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

Completeness of Vision

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

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

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

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

and future requirements.

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

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

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

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