Gartner.

Magic Quadrant for Data Integration Tools

Summary

It's not acceptable for architects or developers to use only postdeployment data resolution. The need for rapid data integration requires tools and platforms with increased ability to read, analyze, and react to local and foreign metadata in a dynamic model with distributed processing capabilities.

Market Definition/Description

This document was revised on 28 September 2016. The document you are viewing is the corrected version. For more information, see the Corrections page on gartner.com.

The data integration tool market was worth approximately $2.8 billion in constant currency at the end of 2015, an increase of 10.5% from the end of 2014. The discipline of data integration comprises the practices, architectural techniques and tools that ingest, transform, combine and provision data across the spectrum of information types in the enterprise and beyond — to meet the data consumption requirements of all applications and business processes.

The biggest changes in the market from 2015 are the increased demand for data virtualization, the growing use of data integration tools to combine "data lakes" with existing integration solutions, and the overall expectation that data integration will become cloud- and on-premises-agnostic.

The market for data integration tools includes vendors that offer software products to enable the construction and implementation of data access and data delivery infrastructure for a variety of data integration scenarios. These include:

- **Data acquisition for business intelligence (BI), analytics and data warehousing —** Extracting data from operational systems, transforming and merging that data, and delivering it to integrated data structures for analytics purposes. The variety of data and context for analytics is expanding as emergent environments — such as NoSQL and Hadoop distributions for supporting big data, in-memory DBMSs, logical data warehouse architectures and end-user capability to integrate data (as part of data preparation) — increasingly become parts of the information infrastructure. With the increased demand to integrate machine data and support Internet of Things (IoT) needs for analytics, the data integration market is heating up.

- **Sourcing and delivery of master data in support of master data management (MDM) —** Enabling the connectivity and integration of the data representing critical business entities such as customers, products and employees. Data integration tools can be used to build the data access and synchronization processes to support MDM initiatives.

- **Data migrations/conversions —** Although traditionally addressed most often via the custom coding of conversion programs, data integration tools are increasingly addressing the data movement and transformation challenges inherent in the replacement of legacy applications and consolidation efforts during mergers and acquisitions. Embedded data integration and conversion is also becoming mandatory with the proliferation of mobile data devices and the literally hundreds of sensors in complex machinery.

- **Data consistency between operational applications —** Data integration tools provide the ability to ensure database-level consistency across applications, both on an internal and an interenterprise basis (for example, involving data structures for SaaS applications or cloud-resident data sources), and in a bidirectional or unidirectional manner. The IoT is specifically exerting influence and pressure here.

- **Interenterprise data sharing —** Organizations are increasingly required to provide data to, and receive data from, external trading partners (customers, suppliers, business partners and others). Data integration tools are relevant for addressing these challenges, which often consist of the same types of data access, transformation and movement components found in other common use cases.

- **Support for governance and management of data assets —** Increasingly, data integration tools are expected to collect audit and monitoring information regarding the deployed data integration services and processes in the organization. This ranges from use cases for simple reporting and manual analysis to the inclusion of recommendations and even automated performance optimization. While primarily focused on management tasks, the ability to profile new data assets and recognize their similar nature and use cases as compared to other data currently integrated is growing in importance. Small devices that roam and attach to data portals will also become prevalent.

The usage of data integration tools may display characteristics not unique to one of these individual scenarios. Technologies in this market are required to execute many of the core functions of data integration, which can apply to any of the above scenarios. Examples of resulting characteristics include:

- Interoperating with application integration technology in a single solution architecture to, for instance, expose extraction, transformation and loading (ETL) processes that extract data from sources as a service to be provisioned via an enterprise service bus.

- Enabling data services as an architectural technique in a service-oriented architecture (SOA) context. Rather than the use of data integration per se, this represents an emerging trend for data integration capabilities to play a role and to be implemented within software-defined architecture for application services.

- Integrating a combination of data residing on-premises and in SaaS applications or other cloud-based data stores and services, to fulfill requirements such as cloud service integration. Organizations are also seeking the capability for pivoting between cloud and on-premises — what Gartner refers to as a hybrid integration platform (HIP).

- Supporting the delivery of data to, and the access of data from, platforms typically associated with big data initiatives, such as Hadoop, NoSQL and cloud-based data stores. These platforms provide opportunities for distributing data integration workloads to external parallelized processes. The emerging concept of a "data lake," where data is continuously collected and stored in a lightly structured NoSQL repository, poses data integration challenges. At the same time, it also provides opportunities to assist in

the application of schemas at data read time, if needed, and to deliver data to business users, processes or applications, or to use data iteratively. In addition, the differing structure of IoT or machine data is introducing new integration needs.

Magic Quadrant

Figure 1. Magic Quadrant for Data Integration Tools

Source: Gartner (August 2016)

Vendor Strengths and Cautions

Actian

Based in Redwood City, California, Actian offers data integration capabilities via Actian DataConnect and

Actian DataCloud. Actian's customer base for data integration tools is estimated to be approximately 7,000 organizations.

STRENGTHS

- **Strong focus on core capability and performance.** Actian offers real-time, messaging-style solutions and bulk/batch-oriented data delivery. Customers like the diverse connectivity for data sources and the support for industry-standard message formats for interenterprise data sharing.

- **Capitalizing on cloud and analytics.** Actian has enhanced its cloud capabilities with the evolution of its integration platform as a service (iPaaS) offering on Actian DataCloud, providing an extension to its analytic offerings and a focus on cloud integration that will include engineered services to further simplify customer onboarding and extend support for business roles.

- **Embedded into solutions.** The ease of embedding DataFlow into other technologies makes Actian's data integration tooling complementary to diverse partners, including independent software vendors (ISVs), system integrators and providers of cloud services, to provide integration functionality within their solutions. Strong corporate viability also makes it a reliable technology vendor partner.

CAUTIONS

- **Minimal rapport with business users or application developers.** While there is an increasing span of data integration tool buyers, ranging from IT-oriented to citizen integrators, Actian lacks visibility with and relative recognition by key nontechnical buyers because customers are largely drawn to Actian's established IT role-oriented strength in data integration.

- **Service support and learning curve.** Actian's user references report concerns with documentation and coordination for major upgrade support and implementation practices as areas they would like to see improvements in, to shorten the learning curve from development to production, and to ease of administration, monitoring and management.

- **Enterprise information management (EIM) and information infrastructure positioning.** Actian's data integration tools' roadmap reflects its technical roots, with feature and delivery enhancements prioritized over innovating the expanse and persona trends in this market, which adversely affected Actian as a strategic partner for enterprises pursuing a comprehensive data integration strategy.

Adeptia

Based in Chicago, Adeptia offers the Adeptia Integration Suite (AIS) and Adeptia Connect. Adeptia's customer base for this product set is estimated at 583 organizations.

STRENGTHS

- **The integrated tool suite covers the basics of batch, message and synchronization.** Adeptia supports the core requirements of bulk/batch data delivery and granular data capture and propagation. The combination of its data integration capability, application integration, enterprise service bus (ESB), B2B integration and trading partner management within a single product suite is appreciated by its reference customers for a faster time to value. It reduces the complexity for buyers through its orchestration engine and workflow support, which includes automated handling of errors and exceptions for complex process automation use cases. Adeptia considers simplification of end-to-end B2B data integration as its priority in this market.

- **Attractive pricing and flexibility.** Reference customers view Adeptia as attractively priced relative to its competitors and value its flexible subscription licensing options. Adeptia's ability to interoperate data integration functionalities with capabilities for ESB and business process management (BPM) is greatly appreciated by clients.

- **Performance, usability and integration platform as a service (iPaaS) support.** Adeptia offers iPaaS capabilities, which enable B2B integration and interenterprise data sharing use cases. It supports integration of on-premises endpoints, cloud endpoints and a combination of the two for all integration patterns for "pervasive integration." Customers also cite ease of use, good performance and throughput, which is particularly relevant to what Gartner calls "business moments."

CAUTIONS

- **Support for big data initiatives.** Adeptia's current implementations and competitive bids indicate extremely limited traction in support for big data initiatives. Since data integration into big data stores (such as Hadoop and NoSQL) is increasingly being emphasized in the market for enabling upcoming and popular use cases (enabling a data lake, for example), Adeptia will continue losing out on this front because it does not have big data integration on its roadmap.

- **Breadth of market coverage.** Reference customers appreciate Adeptia's support for traditional use cases involving bulk/batch, operational and BPM scenarios. However, its product roadmap does not include incorporating other comprehensive styles of data integration (data virtualization, for example) into its AIS platform for exploiting the entire breadth of data integration use cases, which poses a challenge in competitive situations.

- **Lacks some broader information management capabilities.** Customers also expressed a desire for better interoperability and integrated usage between data integration tools, with related technologies for data management and application integration (including data quality, data governance, metadata management and MDM). Adeptia continues to address these concerns by actively expanding its network of technology partners.

Attunity

Based in Burlington, Massachusetts, Attunity offers Attunity Replicate, Attunity Compose and Attunity Visibility. Attunity's customer base for this product set is estimated to number approximately 2,000 organizations globally.

STRENGTHS

- **Market presence/track record.** With more than two decades of experience, Attunity has strong traction in delivering data replication and synchronization technology applied to heterogeneous data types, with a historical strength in addressing mainframe data. Attunity is broadening global partnerships with implementation service providers, technology vendors and cloud infrastructure providers.

- **Expanded applicability.** Through capabilities for replicating data to and from the cloud, and accelerating data warehouse deployments, big data (Hadoop) and workload optimization support, Attunity enables a broader scope of integration styles and capitalizes on digital business opportunities. Added support for Apache Kafka enables real-time intertwining of data movement and event streams.

- **Favorable cost and value.** References customers report the tools deliver good value relative for

change data capture (CDC)/replication.

CAUTIONS

- **Breadth of market coverage and mind share.** While Attunity supports most types of data integration styles Gartner describes, the adoption of Attunity's toolset predominantly reflects replication deployments and basic synchronization, but does not address data virtualization. While awareness of Attunity is starting to grow in this market, there remains a lack of recognition by buyers seeking data integration tooling as their enterprise standard.

- **Synergy with related data management capabilities.** Implementations reflect the need for more support in Attunity tooling's metadata management for interoperating with diverse platforms that require openness to share metadata, drive runtime execution of data integration processes and enable data services. The integrated use of Attunity's data integration capability with comprehensive data quality tooling is cited as a desired improvement to support governance requirements.

- **Guidance and support for implementations.** Deployments in increasingly complex scenarios are raising customers' expectations of Attunity's implementation support and guidance for best practices, which Attunity has been addressing.

Cisco

Based in San Jose, California, Cisco offers the Cisco Information Server and Cisco Integration Platform. Cisco's customer base for this product set is estimated to number more than 380 organizations.

STRENGTHS

- **Evolving toward distributed data and device networks.** Cisco's expanded vision includes plans to integrate data location on distributed networks, including third-party devices (and addresses) — with plans to enable data integration that include specific routing of content based on metadata about the connected use case and devices that will include aspects of distributed optimization. Cisco continues to support the logical data warehouse (LDW), integrated streaming data and IoT environments, and leverages the Cisco Tidal Enterprise Scheduler integration workflows.

- **Agility and rapid time to value.** Cisco has a strong focus on data federation/virtualization, and a well-established track record for capitalizing on the growing demand in this area. Reference customers praise Cisco's data virtualization technology for enabling agile development and using optimization techniques such as pushing processing down to data sources, which minimizes data movement and reduces time to value.

- **Customer relationship and market access.** Reference customers state that Cisco is extremely responsive to customer needs and that the quality of its customer support is good. Cisco's global reach continues to widen the availability of the data integration tools it acquired from Composite Software. Cisco also introduces coopetition options to augment its capabilities (for example, it white-labels Paxata as Cisco Data Preparation).

CAUTIONS

- **Limited breadth of coverage and market resonance.** Cisco Information Server is primarily a data virtualization offering that has been expanded to include other types of delivery. Optimization techniques differ for the types of integration possible and, as a result, bulk/batch, synchronization and migration

capabilities are delivered more as instantiations of the caching tiers that are already present. More adaptations are required to capitalize on information infrastructure and cloud/iPaaS opportunities. Cisco's focus on highly distributed and massively parallel processing sets out to enhance Hadoop integration and optimize distributed runtime deployments.

- **Synergy with data management capabilities is challenged.** Data integration can no longer succeed with a concentration on the "mechanics" of efficiently moving data throughout and between organizations across various platforms. Integration with data quality, dynamic response to profiling statistics and interoperability with master data management (including vertical industry standards) will become even more important in a distributed environment. At present, Cisco offers manually deployed and maintained integration with these accompanying solutions.

- **Deployment and diagnostic limitations.** Reference customers identify diagnosis of error messages as challenging, and require better diagnostic support and integrated documentation. Customers also expressed a desire for a more mature user community, and for improved access to implementation guidance and best practices.

Denodo

Based in Palo Alto, California, Denodo offers the Denodo Platform. Denodo's customer base for its data integration product is estimated at 300 midsize to large companies. With an established customer base, the Denodo Platform provides data virtualization, for joining multistructured data sources from DBMSs, websites, documents and a variety of enterprise, cloud and big data repositories.

STRENGTHS

- **Added functionality.** In 2015, Denodo introduced new dynamic query optimization features to support cost-based optimization specifically for big data and cloud environments, including a Resource Manager for policy-based workload management for resources, predicate optimization techniques including full and partial aggregation pushdown below joins, partitioned unions for logical data warehouse and data lakes requirements, and performance optimization. Denodo also delivers a self-service data preparation capability with data, entity-level, relationship and search-style browsing capabilities.

- **Broad connectivity support.** Denodo's connectivity support includes relational databases, prerelational legacy data, flat files, XML, packaged applications and emergent data types including Hadoop and cloud-based data sources (such as Apache Spark and Amazon Redshift) and traditional technology. Examples include: introspecting stored procedures, compatibility with IBM, Microsoft, Teradata and SAP Hana connectors. It Also addresses Java Database Connectivity (JDBC), Open Database Connectivity (ODBC), Java Message Service (JMS)-compliant message queues, REST and SOAP web services, OData, JavaScript Object Notation (JSON), XML, portlets and SharePoint web parts.

- **Leveraging Implementation and technology partners.** Denodo's partner network encompasses global and regional system integrators and software vendors, including Cloudera, Hortonworks, SAP, Tableau Software, Infosys, Accenture, Cognizant and HCL Technologies. Software vendors also license or bundle Denodo's functionality as part of their products for analytics, big data and operational use cases. Denodo is also available on the Amazon Web Services (AWS) Marketplace.

CAUTIONS

- **Unavailable skills and inconsistent support/documentation.** A small but meaningful number of user

organizations reported issues with finding skills, which is being addressed with the implementation partnerships mentioned above, and with initial utilization of the tool — due to inconsistent documentation with regard to items such as managing semantic model versions, and in some cases misaligned use cases.

- **Go-to-market, delivery and pricing challenges.** Some reference customers report that Denodo's pricing models are misaligned (not matching AWS deployment models, for example). Denodo has addressed this pricing misalignment in its 2016 pricing. Pricing can be related to future purchase or to use-case alignment, both of which are reported. Customers indicate that Denodo's Java interface and capabilities need improvement, and some would like to see the platform on more cloud PaaS offerings (such as Microsoft Azure, which is on Denodo's roadmap).

- **Lack of market recognition.** Denodo is becoming known among organizations seeking data virtualization in particular, which is growing at a faster rate; however, with more than 85% of all organizations beginning with their bulk/batch (or even DBMS) vendor as a potential virtualization provider, it is difficult for Denodo to increase its market mind share (which is not to be confused with market success). Denodo has shown year-over-year growth in the period leading up to this report.

IBM

Based in Armonk, New York, IBM offers the following data integration products: IBM InfoSphere Information Server Enterprise Edition (including InfoSphere Information Server for Data Integration, and InfoSphere Information Governance Catalog), InfoSphere Federation Server, InfoSphere Data Replication, InfoSphere Information Server Enterprise Hypervisor Edition, WebSphere Cast Iron Live, BigInsights BigIntegrate and DataWorks. IBM's customer base for this product set is estimated at more than 11,000 organizations.

STRENGTHS

- **Breadth of functionality and diversity of usage .** Customer usage includes bulk/batch data movement, CDC and propagation, data replication, data virtualization and message-oriented movement. Reference customers routinely cite as key strengths the breadth of functionality of and integration via open extensible metadata exchange and scalability. IBM further expanded its capabilities with simplified SaaS-based self-service data preparation and data integration for analytics (using data virtualization, DataWorks and Data Click) and native integration into Hadoop environments.

- **Mind share and capitalization on market trends .** IBM is frequently mentioned by Gartner clients in competitive evaluations. IBM continues to gain traction as an enterprise standard for data integration infrastructure. The tight linkage and embedding of DataWorks (for self-service data preparation) in Watson Analytics, dashDB and Cloudant facilitate a cloud analytics ecosystem — allowing customers to integrate hybrid on-premises and cloud architectures.

- **Alignment to information infrastructure and EIM .** IBM continues to innovate to support deep alignment between data integration with EIM goals — including data governance, data quality, MDM, big data integration, support for citizen integrators and iPaaS. IBM's focus on extending data integration use cases to line-of-business users by extending self-service data preparation capabilities and open governance and metadata management is well-received by reference customers.

CAUTIONS

- **Cost model and total cost of ownership (TCO).** Customers sometimes call out the perceived high cost of IBM's software, and the complexity of its licensing and pricing models. IBM has been addressing these concerns over several years through higher-value bundling of offerings as well as offering new pricing models such as monthly and pay-as-you-go options, in addition to combining some offerings together at no additional cost to new or existing customers. New pricing and packaging options target positive impacts on customers purchasing these offerings from IBM for the first time.

- **Deployment of multiple components across the portfolio .** Customers expressed difficulty integrating IBM's data integration tools alongside other IBM products within the InfoSphere portfolio. Customers expressed challenges relative to overlapping features between IBM products (that is, which components can be used license-free from previous investments). IBM is able to leverage its existing market share for additional sales ; however, this could become challenging given the reported integration issues.

- **Ease of upgrade and user experience .** IBM attempts to address product complexity, but some reference customers reported continuing upgrade difficulties with some versions. They also identified a need for IBM to improve the user experience offered by its data integration tools. With its most recent versions, IBM provides in-place upgrade capabilities for simplified migration.

Informatica

Based in Redwood City, California, Informatica offers the following data integration products: Informatica Platform (including PowerCenter, PowerExchange, Data Services, Data Replication, Advanced Data Transformation, Ultra Messaging, B2B Data Transformation and Data Integration Hub), Vibe Data Stream, Informatica Cloud Integration, IronCloud Platform, Big Data Management, Intelligent Data Lake, Intelligent Streaming, Enterprise Information Catalog and Informatica Data Preparation, Data Integration Hub and Informatica Data Preparation). Informatica's customer base for this product set is estimated at more than 7,000 organizations.

STRENGTHS

- **Rapidly adapts to market functionality demands .** Informatica's product development and roadmap address diverse capabilities including batch ETL, real-time integration (message - oriented data movement , web services, stream processing and change data capture), publish/subscribe-data sharing, and data virtualization. Strong interoperability and synergies between its data integration tools and other Informatica technologies encourage usage as an enterprise standard. An emphasis on supporting digital / IoT data integration, iPaaS, self-service data preparation, big data , data governance and data security opportunities capitalizes on demand trends. Informatica is starting to appear in "best - fit engineering" scenarios as part of enabling hybrid integration platform (HIP) capabilities.

- **Strong appeal to data management and nontechnical roles and personas .** Informatica continues to expand its business-user-facing functionality across hybrid architectures. It now supports self-service data preparation through its Data Preparation (Rev) offering across on-premises, cloud and big data, and Data Wizard app. Emphasis on collaborative business-user-oriented functionality and the agility of data integration infrastructure as an enterprise standard resonates with diverse types and sizes of organizations.

- **Broad market presence and dedicated focus on innovation around metadata management, big data, data lakes and hybrid.** Informatica exhibits the highest frequency of " appearances " on Gartner

contract reviews calls and other competitive situations. Its global network of partners , resellers , major system integrators and external service providers delivers extensive implementation support. Informatica's metadata hub, Live Data Map (released in version 10), advances metadata-rich capabilities to enable machine learning, introspective modeling, metadata analysis and metadata -driven applications. Informatica's Intelligent Data Lake and Big Data Management aim at ensuring that foundational principles of data integration, data governance and data security are upheld in big data deployments.

CAUTIONS

- **Pricing and perceptions of TCO .** Informatica's hardware - based pricing and licensing models and perceived high TCO remain a key issue. Reference customers point to difficulty in understanding its licensing methods and cite "higher costs relative to the alternatives" as their main reason for choosing another vendor. Informatica introduced simpler packaging of its core PowerCenter Editions, and now offers subscription/pay-as-you-go - based licensing options.

- **Clarity of product messaging and portfolio architecture .** Informatica's portfolio has grown large, and some reference customers express concern about overlapping functionality possibly leading to shelfware. Reference customers expect more clarity on product classification, features , integrated components and capabilities. They also cite confusion about how to add functionality and / or data delivery styles (such as data virtualization or real-time integration) to existing Informatica deployments.

- **Business solutions focus toward go-to-market and customer experience.** Informatica has stated that it plans to go to market with more solutions bundles, vertical messaging and appeal toward non-IT audiences, which has not been its traditional customer base. This will be a multiyear challenge requiring significant change management at Informatica and optimally addressing the needs of customers in both simple and complex scenarios.

Information Builders

Based in New York, Information Builders offers the following data integration products: iWay Integration Suite (composed of iWay Service Manager and iWay DataMigrator) and iWay Universal Adapter Suite. Information Builders' customer base for this product set is estimated to be more than 840 organizations at over 2,000 sites.

STRENGTHS

- **Integrating the integration.** Information Builders delivered on some of its vision for a more tightly integrated solution platform throughout 2015 and early 2016. A model editor that is now integrated with processing workflow configuration, plus improvements to auditing, alerts and operational monitoring, were all completed. A data steward workbench that utilizes profiling to identify issues is integrated with the data quality solution and a workflow manager that tracks proposed changes to data and models with multiuser annotation capability. The vendor's capabilities in adapters and connectivity, comprehensive data transformation and encapsulating data into real-time message flows continue to be regarded as key strengths in deployments.

- **Making big data normal.** Information Builders' functionality for governance has been extended into Hadoop systems with data pattern analysis (and subsequent cleansing rules), recognition of anomaly data that fails patterns and generates a remediation workflow, wide-to-deep-to-wide data transposition,

and additional data lineage capability through integration with Apache Atlas and Cloudera's Navigator. Information Builders' Omni-Gen combines data governance, management, quality, lineage and integration, offering a more cohesive platform for combining traditional with newer, emerging information types.

- **Customer relationship.** Information Builders' customers report overall satisfaction with the product and its balance of features and functionality, with the only caveat being ease of use of the interface — and even that issue is moderate (at average) overall. The broad connectivity of the overall platform and the strength of the technology are enhanced by the customer experience for issue resolution and best practices from its professional services; customers report a feeling of "partnership."

CAUTIONS

- **Mind share with business leaders and influencers.** As in past years, Information Builders appeals mainly to technical communities and IT buyers, but it has relatively low mind share with business management and process leaders — particularly in EMEA. A new focus on self-service data preparation has not yet gained traction. Within the Gartner client base, Information Builders appears infrequently in competitive situations.

- **Narrow regional and use-case customer base.** Almost all of Information Builders' customer base is reported in North America and Western Europe across a fairly broad set of vertical industries. Customers there similarly report a focus on traditional use cases (such as analytics data transformation, data synchronization and message-based delivery), and are generally not broadening the use-case footprint in the organization (even with plans to do so).

- **Product documentation, time to value and market responsiveness.** Customers report moderate dissatisfaction with Information Builders' pricing approaches being complex. Information Builders has simplified pricing recently to address these concerns. A lack of third-party service support or even enough bandwidth within its services are cited as frustrating points by customers. In addition, Information Builders demonstrates new functionality as needed, but often slightly behind market demand.

Microsoft

Based in Redmond, Washington, Microsoft offers data integration capabilities via SQL Server Integration Services (SSIS), which is included in the SQL Server DBMS license. Vast worldwide deployments of Microsoft SQL Server involve usage of SSIS for data integration, although Microsoft does not report a specific customer count for SSIS.

STRENGTHS

- **Relevant capabilities and TCO.** Customers cite low overall TCO, speed of implementation, ease of use, and the ability to integrate with other Microsoft SQL Server capabilities as the main reasons for choosing SSIS over the alternatives. The expected focus on data delivery to the Cortana Intelligence Suite seeks to establish synergy between data integration, cloud and cognitive computing capability.

- **Synergistic support of data-, process- and user-driven integration.** Connectivity to diverse data types and added support for Hadoop Distributed File System (HDFS) enables SSIS to prepare data and extract results for Hadoop. Azure Data Factory provides the same capabilities, but also provides monitoring and management of data processing ("data pipelines"). Azure Data Catalog provides a

metadata catalog for enabling easy registration and discovery of datasets to facilitate self-service data preparation.

- **Extensive market presence and skills.** The broad use of SSIS has produced widely available community support, training and third-party documentation on implementation practices and problem resolution approaches.

CAUTIONS

- **Market messaging and focus.** There is some inconsistency of reports across organizations regarding the perceived coherence of Microsoft's vision for data integration, as those organizations require new capabilities and relevant best practices to synergistically leverage Microsoft's broader information management technology portfolio.

- **Platform support.** The inability to deploy SSIS workloads on non-Windows environments is a limitation for customers wanting to draw on the processing power of diverse hardware and operating environments.

- **Integrated use of tools.** Adoption experiences indicate that greater ease of integrated deployment is desired between SSIS and other Microsoft products, with a reduced requirement for custom efforts. Microsoft plans to tighten integration of SSIS with Azure Data Factory.

Oracle

Based in Redwood Shores, California, Oracle offers the following data integration products: Oracle Data Integrator (ODI), Oracle GoldenGate and Oracle Data Service Integrator. Oracle's customer base for this product set can only be estimated — at more than 10,000 organizations for all these products worldwide — because Oracle does not break out revenue or customer count by products.

STRENGTHS

- **Feature function evolution in 2015.** In 2015, Oracle released GoldenGate for Big Data; included push-down to Spark (via pyspark.sql) in ODI for Big Data; and introduced self-service integration capability in Data Prep (including support for structured data sources). Also in 2015, natural-language processing combined with graph — to support machine learning capabilities — was added to Big Data Preparation. In parallel, GoldenGate added support for multiple data sources and platforms.

- **Leveraging modern integration trends.** Oracle's data virtualization capability has improved. ODI manages message-based, bulk/batch and data virtualization from an integrated administration console, and even permits bulk/batch and messaging (which leverages the Apache Kafka open-source messaging system) on the same host. Oracle also offers all of these capabilities as iPaaS solutions.

- **Well-established synergy with Oracle technologies.** Recognition of Oracle's diverse portfolio for addressing data integration and other data and application-oriented requirements (spanning data quality tools, MDM solutions, ESB, analytic appliances and enterprise applications) continues to fuel its appeal in deployment scenarios.

CAUTIONS

- **Improvements are not yet embraced by users.** Product satisfaction remains at its 2015 levels (which was a "down" year). New functions and features are eagerly anticipated, but Oracle's customers report that significant preproduction testing is needed before utilizing them broadly in the enterprise. Even with

this in mind, Oracle data integration tool customers include many international brands that leverage the various products for many operational data integration needs.

- **"Bugs" and support create issues.** A significant number of customer references indicated frequent bugs, upgrades impacted by bugs, and then support to resolve both the upgrades and the bugs, with the result that Oracle was rated as below average across the market. Even with this understanding, customers will or may purchase more Oracle licensing during the next 12 months, with less than 30% affirming that they will not do so. Even those that have no plans to buy more are actively engaged in maintaining their existing implementations, with moderate or above-average satisfaction with their current deployment.

- **Experience base has a traditional focus.** While most Oracle customers report that they utilize the products for transformation, synchronization or migration, they also report no intention of expanding into data virtualization, integrating with data quality/governance solutions or even moving to the cloud. Oracle executes well in traditional use cases, but customer indications are that they are seeking additional tooling for newer market applications. This does not disqualify Oracle's new capability, but does demonstrate that it is currently unproven or unknown in the customer base. Oracle has begun to address CDC requirements for big data with new features as demand increases.

SAP

Based in Walldorf, Germany, SAP offers the following data integration products: SAP Data Services, SAP Replication Server, SAP Landscape Transformation Replication Server, SAP SQL Anywhere, SAP Process Orchestration, SAP Hana Platform, SAP Hana Cloud Integration, SAP Event Stream Processor and SAP PowerDesigner. SAP's customer base for this product set is estimated at more than 23,000 organizations.

STRENGTHS

- **Broad usage and functionality.** SAP's broad portfolio continues to attract customers seeking a mix of granularity, latency, and physical and virtualized data delivery, alongside options to integrate with information governance and MDM offerings across the SAP ecosystem. Enhanced processing — to operate with distributed big data, cloud platforms and multistructured data, including text, social and spatial content types — extends SAP's relevance for digital business.

- **Aligned support of data, application and governance needs.** Assimilating diverse data integration tooling in a unified data management platform leverages SAP Hana's in-memory infrastructure to simplify the portfolio. In enabling components to share metadata, one design environment and administrative tooling, and to operate alongside information stewardship, process integration and self-service capabilities, SAP enhances synergies across information and application infrastructures.

- **Vast market presence and ecosystem.** SAP's brand recognition, global presence and the huge installed base using its diverse data management infrastructures and applications provides the company with many opportunities to naturally grow its data integration tool adoption and cross-sell to customers using adjacent technologies.

CAUTIONS

- **SAP-focused.** Concerns about the heavy focus on integration approaches that are aligned toward SAP applications and Hana-oriented data infrastructure pose challenges to buyers requiring agnostic data

integration tooling. SAP has stated on its roadmaps a focus toward significant investment in research and development for agnostic data integration tools. While addressing new feature/functionality in the tools (notably in big data), the focus on SAP-centric solutions persists, which tends to isolate SAPs visionary concepts from a broader market and improve deployments primarily within the SAP customer base.

- **Customer experience.** SAP's reference customers highlighted a need for improvement in its technical support and professional services. SAP is addressing these concerns through improving incident interactions (via tablets and smartphones), self-help and community forums.

- **Pricing and TCO.** Prospective buyers express challenges with SAP's pricing relative to their expectations and budgets for data integration tools. Inadequate pricing models, price points or the perceived overall TCO are cited as adverse factors in competitive evaluations. SAP's subscription-based pricing sets out to address cost concerns potentially raised by customers.

SAS

Based in Cary, North Carolina, SAS offers the following data integration products: SAS Data Management, Federation Server, SAS/ACCESS, SAS Data Loader for Hadoop and SAS Event Stream Processing. SAS's customer base for this product set is estimated to be 14,000 organizations.

STRENGTHS

- **Broad and integrated portfolio.** During 2015, SAS enhanced its Hadoop integration (improvements for Hawq, Hive, HiveQL, Impala, AWS Redshift, plus SAS Data Loader for Hadoop, and more) as well as additional functionality in its integration processes — with data quality processing. The breadth and completeness of SAS's core functions and the integration of components position it well to compete with the larger and more established vendors in this market.

- **Customer relationships.** Reference customers report that their relationship with SAS, both before purchasing and after implementation, is exceptional. This contributes to longer-term, recurring engagements.

- **Product reliability and stability.** SAS exhibited overall improvements in metadata management, federation capabilities (including pushdown and processing redistribution based on cost-based optimization) and event-stream processing (including in-line machine learning for data integration processes). Reference customers praised SAS's products for their stability, reliability, robustness and effectiveness. These qualities, along with synergistic capabilities across the portfolio, establish SAS's data integration technology as dependable and mature.

CAUTIONS

- **Narrow use-case focus.** While SAS tools can be used in a broad spectrum of use cases — from integrating data in preparation for MDM through transactional application integration and analytics — SAS focuses primarily on analytics. While this is not in itself an issue, customers should be aware that SAS functionality is therefore concentrated on introducing analytical functions to support integration within the processing streams, and may not provide specific advantages over other tools beyond analytics use cases.

- **Cost and pricing.** SAS issues regarding pricing are a perennial complaint, both in terms of selecting it

as an issue and in comments provided when answering "other issues." This is a consistent pattern and occurs at a more frequent rate than with other vendors in the market. That said, given levels of customer satisfaction and with more than 60% of SAS customers planning on purchasing new licenses and capabilities, it is understood that the price is considered merely the "entry fee" for high levels of satisfaction.

- **Usage and availability of deployment skills.** Customers report virtual isolation in analytics use cases (SAS gains high marks in analytics use cases); however, integration with other tools (for example, service buses or application integration with services capability) is almost absent, as is synchronization and even virtualization. That said, analytics generally relies on heavier integration styles that move and transform data — where SAS does well. Customers either do not use SAS for big data needs, or score it low; they also report inconsistent deployment/ease-of-use experiences with scores below the market average.

Syncsort

Based in Woodcliff Lake, New Jersey, Syncsort offers DMX, DMX-h and Ironstream. Syncsort's customer base for this product set is estimated at 1,500 organizations.

STRENGTHS

- **Robust and high-performance functionality.** Strong performance for ETL and extraction loading and transformation (ELT) processing, lower TCO compared with the market leaders, and time to value are all cited as key attractions for references selecting Syncsort. An expanding focus for deploying workloads on big data platforms (including Hadoop and Spark) — together with enhanced metadata and lineage support — positions Syncsort's relevance in digital business.

- **Capitalizing on a distributed data ecosystem.** Syncsort's customers appreciate the toolset's scalability and throughput in working with the Hadoop ecosystem, populating data lakes, ingesting streaming data, and offloading ETL or ELT workloads from data warehouses and mainframes to Hadoop. Through offerings for AWS and the ability to operate with Docker, ETL processing is deployable across physical, virtual and cloud environments.

- **Customer experience.** Customers identify Syncsort's technical support and their overall relationship with Syncsort as positives. Evolving technology partnering for extended functionality (for example, Striim for CDC, Trillium Software for data quality, and Waterline Data for data preparation) allows Syncsort to position itself to satisfy broader demands.

CAUTIONS

- **Breadth of market coverage.** Syncsort's adoptions are predominantly drawn to supporting bulk/batch data movements. The continuing shift of buyer demands toward comprehensive data delivery styles and integrated usage between data integration tools with related technologies for data management and application integration pose challenges for Syncsort in competitive situations.

- **Usability and appeal to business-facing roles.** Usage concerns for improving Syncsort's self-help references, implementation guidance and documentation reflect customer desire for deployment simplicity. The increasing involvement of business-oriented roles in data integration activities elevates the need for easing implementations.

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Alignment with broadening information management capabilities. Syncsort's lack of usage traction for information stewardship and MDM, alongside data quality/governance support, represents a gap relative to the current demand trend for synergies between data integration and diverse information capabilities. Syncsort has a partnership approach to gaps in its provision.

Talend

Based in Redwood City, California, Talend offers Talend Open Studio, Talend Data Fabric, Talend Data Management Platform, Talend Big Data Platform, Talend Data Services, Talend Integration Cloud and Talend Data Preparation. Talend's paying customer base for this product portfolio is estimated at more than 1,300 organizations. Talend filed for an IPO in July 2016 and their public filing is available at SEC.gov .

STRENGTHS

- **Cost model and flexibility.** Reference customers appreciate Talend's unique, linear and scalable licensing model — composed of the data integration platform fee and additional developer licenses fee — which allows customers to start with small, core data integration projects and then grow their portfolio for more advanced data integration projects (such as integration with Hadoop data stores).

- **Integrated product portfolio for data integration and for operating with complementary technologies.** Talend possesses a comprehensive portfolio of data integration and related technology (including data quality, MDM, ESB, application integration and metadata management), and has recently added iPaaS and data preparation capabilities. Customers value this robust product set, which allows them to build and execute end-to-end data management projects and use cases and to capitalize on data integration use cases that require synergy with their related technologies.

- **Strength in core data integration capabilities and commitment to evolving trends.** Reference customers and prospects are still drawn to Talend's robust core data integration capabilities, including bulk/batch movement of data, which continue to draw a significant proportion of buyer base. Talend also has products catering to current and evolving market needs, including its recent offering of iPaaS (now including AWS integration) and data preparation; significant investment in data integration operations running natively on Hadoop and evolving operational uses cases (Apache Storm and Apache Spark environment); planned features for data lake governance; and partnerships with Cloudera Navigator and Hortonworks Atlas.

CAUTIONS

- **Product stability, support and availability of talent and partners.** Talend's reference customers have sometimes struggled with the stability and performance of its new releases, and also with finding adequate partners/skilled resources that are adept with Talend design and implementation. Talend has launched a new partner certification program and is working with partners to design new reference architectures.

- **Needs to focus on more roles in the environment, change in market skills.** Talend has its roots in open source, and with the technical community in general. Current market momentum is strongly moving toward enabling multipersonas and self-service integration options for nontechnical users. Talend has started addressing more personas with a self-service via Talend Data Preparation and hybrid cloud integration capabilities through iPaaS. Talend is investing in a new partner certification

program and training for partners and customers.

- **Recognition for breadth of functionality.** Reference customers and Gartner inquiries indicate that while Talend's capabilities resonate well with traditional data delivery styles, it must increase awareness of its support for other data integration styles (particularly replication/synchronization of data for real-time integration and data virtualization). More comprehensive and integrated metadata management support across its product portfolio is also desired.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor's appearance in a Magic Quadrant or MarketScope 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

- Attunity

Dropped

- None

Inclusion and Exclusion Criteria

To be included in this Magic Quadrant, vendors must possess within their technology portfolio the subset of capabilities identified by Gartner as the most critical from within the overall range of capabilities expected of data integration tools. Specifically, vendors must deliver the following functional requirements:

- Vendors whose customer reference base cannot represent any mix of their products' use in three of the following seven technical deployment styles will be excluded: bulk/batch, message-oriented, virtualization, replication, synchronization, migration, and data services bus (SOA)-style deployments.

  - Bulk/batch includes single or multipass/step processing that includes the entire contents of the data file after an initial input or read of the file is completed from a given source or multiple sources, and all processes take place on multiple records within the data integration application before the records are released for any other data consuming application.

  - Message-oriented utilizes a single record in an encapsulated object that may or may not include internally defined structured (XML), externally defined structures (electronic data interchange), a single record or other source that delivers its data for action to the data integration process.

  - Virtualization is the utilization of logical views of data, which may or may not be cached in various forms within the data integration application server or systems/memory managed by that application server. Virtualization may or may not include redefinition of the sourced data.

  - Replication is a simple copy of data from one location to another, always in a physical repository. Replication can be a basis for all other types of data integration, but specifically does not change the form, structure or content of the data it moves.

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- Synchronization can utilize any other form of data integration, but specifically focuses on establishing and maintaining consistency between two separate and independently managed CRUD (create, read, update delete) instances of the same data model for an operational data consistency use case. Synchronization also maintains and resolves instances of data collision with the capability to establish embedded decision rules for resolving such collisions.

  - Migration is the copy of data from one version of a database to another and/or the copy of data from an existing production version of an application to another version or instance of that same application. Migration specifically audits the data integrity and validation differential between the application versions.

  - Data services bus (SOA) capability is the ability to deploy any of the other data integration styles, but with specific capability to interoperate with application services (logic flows, interfaces, end-user interfaces [EUIs], and so on) and pass instructions to and receive instructions from those other services on the bus. DSB includes auditing to assist in service bus management, either internally or by passing audit metadata to another participating service on the bus.

- Range of connectivity/adapter support (sources and targets) — Native access to relational DBMS products, plus access to nonrelational legacy data structures, flat files, XML and message queues, as well as emerging data asset types (such as JSON).

- Mode of connectivity/adapter support (against a range of sources and targets), support for change detection, leveraging third-party and native connectors, connection and read error detection, and integrated error handling for production operations.

- Data delivery modes support — At least three modes among bulk/batch data movement, federated/virtualized views, message-oriented delivery, and data replication and synchronization.

- Data transformation support — At a minimum, packaged capabilities for basic transformations (such as data type conversions, string manipulations and calculations).

- Metadata and data modeling support — Automated metadata discovery, lineage and impact analysis reporting, ability to synchronize metadata across multiple instances of the tool, and an open metadata repository, including mechanisms for bidirectional sharing of metadata with other tools.

- User- or role-specific variations in the development interface capable of various workflow enhancement mechanisms, which may include supporting templates, version modification (via internal library management or other mechanism), quality assurance capability either via audit/monitor metadata (manual) or embedded workflows (administrator tools).

- Design and development support — Graphical design/development environment and team development capabilities (such as version control and collaboration). This includes multiple versions running in disparate platforms and multiple instances of services deployments.

- Data governance support — Ability to import, export and directly access metadata with data profiling and/or data quality tools. Accepting business and data management rule updates from data stewardship workflows and sharing data profiling information with such tools is highly desired.

- Runtime platform support — Windows, Unix or Linux operating systems.

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Service enablement — The ability to deploy functionality as services, including multiple operating platforms. The ability to manage and administer operations on multiple platforms and environments is significantly desired.

In addition, vendors had to satisfy the following quantitative requirements regarding their market penetration and customer base. Vendors must:

- Generate at least $20 million of their annual software revenue from data integration tools (perpetual license subscription or maintenance/support), or maintain at least 300 maintenance-paying customers for their data integration tools.

- Support data integration tool customers in at least two of the following geographic regions or specific national markets: North America, South America, Europe and Asia/Pacific.

- Demonstrated market presence will also be reviewed and can be assessed through internal Gartner search, external search engines, Gartner inquiry interest, technical press presence and activity in user groups or posts. A relative lack of market presence could be determined as a reason to exclude a product/service offering.

Vendors could be excluded that focus on narrow use cases that are too specific for broader market application. Some tools were excluded because:

- They focused on only one horizontal data subject area; for example, the integration of customer-identifying data.

- They focused only on a single vertical industry.

- They served only their own, internally managed data models and/or architectures (this includes tools that only ingest data to a single proprietary data repository) or were used by a single visualization or analytics processing platform.

Many vendors of data integration tools do not meet the above criteria and are therefore not included in this Magic Quadrant. For example, many vendors provide products to address one very specific style of data delivery (such as data federation/virtualization) and cannot support other styles. Others provide a range of functionality, but operate only in a specific technical environment. Still others operate only in a single region or support only narrow, departmental implementations. Some vendors meet all the functional, deployment and geographic requirements, but are very new to the data integration tool market and therefore have limited revenue and few production customers.

Evaluation Criteria

Ability to Execute

Gartner analysts evaluate technology providers on the quality and efficacy of the processes, systems, methods or procedures that enable IT providers' performance to be competitive, efficient and effective, and to positively affect revenue, retention and reputation. Ultimately, technology providers are judged on their ability to capitalize on their vision, and their success in doing so.

We evaluate vendors' Ability to Execute in the data integration tools market by using the following criteria:

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Product/Service. Organizations increasingly seek "severability," or the capability to isolate on specifically required functions that are then reflected in their implementation approach and cost allocations. Connecting data integration activities to data quality and governance-related capabilities (such as master data management) become an integral support of all use cases that can share high-quality data as well as lineage and nonlineage metadata, with runtime management and monitoring support. How well the vendor supports the range of distinguishing data integration functionalities required by the market, the manner (architecture) in which this functionality is delivered, support for established and emerging deployment models, and the overall usability and consumption of the tools are crucial to the success of data integration tool deployments.

- **Overall Viability.** Overall vendor viability is reviewed and utilized by end-user organizations and developers in determining a supplier's capability to deliver ongoing production support. Importantly, open-source solutions are measured here by the strength of their community and the overall capability of the governing body to guide the roadmap and manage open-source projects. Suppliers need to provide ongoing support for the massive bulk/batch data movement market (R&D capability and support/maintenance for existing solutions) even while pursuing new capabilities in new markets. The appropriateness of the vendor's financial resources, the continuity of its people, and its technological consistency affect the practical success of the business unit or organization in generating business results.

- **Sales Execution/Pricing.** Sales execution and pricing are critical in today's market, but diversity of packaging, licensing and delivery options are the primary keys. Pricing by verticals, allowing for pricing by use-case, role-basis, volumetric and performance metrics are all considered applicable for different market needs. In addition, pricing by features and functionality is increasingly sought to allow for flexible use cases within familiar toolsets. The effectiveness of the vendor's pricing model in light of current customer demand trends and spending patterns, and the effectiveness of its direct and indirect sales channels were scored as part of the evaluation.

- **Market Responsiveness/Track Record.** Market track record is itself one measure of market responsiveness, and in this case data integration tools are much like other infrastructure-focused solutions. Traditional bulk-batch processing is still the predominant demand. Often organizations are demanding data virtualization, message-oriented data movement, replication and synchronization as well as simple migration. Not only do most solutions overlap, but the market is demanding a capability to deliver all forms of integration to differently skilled implementers with everything from simple data preparation through self-service data integration to enterprise-class systems. The degree to which the vendor has demonstrated the ability to respond successfully to market demand for data integration capabilities over an extended period and how well the vendor acted on the vision of prior years were scored as part of the evaluation.

- **Marketing Execution.** Marketing execution traditionally was considered the positioning and declarations of a supplier, but now end-user organizations use it frequently as a gauge of how in-tune supplier roadmaps are with overall market demand. Suppliers need to be aware of emerging best practices for data management infrastructure and if they and their customers can specifically benefit from specialized horizontal or vertical capabilities, geographically targeted approaches or partner-supported implementation practices. The overall effectiveness of the vendor's marketing efforts, which impacts its mind share, market share and account penetration is important. The ability of the vendor to adapt to

changing demands in the market by aligning its product message with new trends and end-user interests was scored as part of the evaluation.

■ **Customer Experience.** Data integration has evolved to include a broad range of expectations when it comes to customers' experience. The level of satisfaction expressed by customers with the vendor's product support, professional services, their overall relationship with the vendor, and their perceptions of the value of the vendor's data integration tools relative to costs and expectations is part of the evaluation. This criterion retains a weighting of "High" to reflect buyers' scrutiny of these considerations as they seek to derive optimal value from their investments. Analysis and rating of vendors against this criterion are driven directly by the results of a customer survey executed as part of the Magic Quadrant process.

■ **Operations.** Operations are not specifically differentiating to end-user markets — but product management consistency and support/maintenance practices add to the overall customer experience as well as the stability of senior staff.

Table 1. Ability to Execute Evaluation Criteria

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

Source: Gartner (August 2016)

Completeness of Vision

Gartner analysts evaluate technology providers on their ability to convincingly articulate logical statements about current and future market direction, innovation, customer needs and competitive forces, as well as how they map to Gartner's position. Ultimately, technology providers are assessed on their understanding of the ways that market forces can be exploited to create opportunities.

We assess vendors' Completeness of Vision for the data integration tools market by using the following criteria:

- **Market Understanding.** A visionary market understanding recognizes the importance of advanced information management/integration to support both operational and analytics data use cases. Applications and data management both must address the concept of role-based development. "Citizen" integrators will want rapid access to data without concerns for production optimization, and analytic assistance for data auditing, profiling, qualifying and conformance/alignment will be critical — but will need metadata-driven warnings as well as template library management to support their efforts. The degree to which the vendor leads the market in new directions (in terms of technologies, products, services or otherwise) is key, alongside its ability to adapt to significant market changes and disruptions.

- **Marketing Strategy.** Visionary market strategy will both inform and anticipate the customer needs and future demands. Organizations are seeking specifically identified use cases for different types of integration. The degree to which the vendor's marketing approach aligns with and/or exploits emerging trends and the overall direction of the market is vital. One important aspect is the ability to clearly align the roadmap and current product capabilities with both "hyped" and durable trends in the market.

- **Sales Strategy.** This criterion covers the alignment of the vendor's sales model with the ways in which customers' preferred buying approaches will evolve over time. In particular, current data integration efforts are seeking variable types of pricing models to support differing implementation styles and different-size efforts. Scaled pricing models are becoming particularly interesting. Suppliers must consider if their internal compensation models incentivize delivery that matches customer demand and implementation profiles.

- **Offering (Product) Strategy.** Product strategy vision includes the roadmap for continued support of traditional integration needs but also expands to fill current gaps, weaknesses and opportunities to capitalize on demand trends in this market. Intense evolutions in this vision include metadata analysis, machine learning based on experiential and design metadata, and the capability to recognize discontinuities in data that vary from the integration-intended design. A new expectation for interactive design with analytic models and business process modeling tools has emerged — at first sensing change to be addressed with a manual workflow, but this will soon be followed by a detect-with-recommendation response. The emerging demand for self-healing systems is more of a roadmap item than current market demand. In addition, given the requirement for data integration tools to support diverse environments for data, delivery models, and platform-mix perspective, we assess vendors on the degree of openness of their technology and product strategy.

- **Business Model.** A visionary business model will balance the emerging (and increasingly stringent) demand for managing internal and external compliance and risk while providing support for existing customers. While broad, all-inclusive models represent one solution approach, it is also expected and reasonable to assume that tightly targeted models for traditional delivery needs can cut delivery cost, increase adoption and deliver specific integration needs to end-user organizations. The overall approach the vendor takes to execute its strategy for the data integration tools market — including diversity of delivery models, packaging and pricing options, and partnership — is important.

- **Vertical/Industry Strategy.** This is the degree of emphasis the vendor places on vertical solutions, and the vendor's depth of vertical market expertise.

- **Innovation.** The current innovation demands in the market are centered on managing location-agnostic capability. Integration should run on-premises and the cloud and switch between them. As data

becomes highly distributed, data integration activities are also required to become easily distributable to any location of data or recommending/determining when data needs to be moved for optimal processing. As information management use cases gain in importance to focus on transient data (traditionally the forte of message-oriented technologies), demand for converging data and application integration approaches is rapidly increasing. Important here is the degree to which the vendor demonstrates creative energy in the form of enhancing its practices and product capabilities, as well as introducing thought-leading and differentiating ideas and product plans that have the potential to significantly extend or reshape the market in a way that adds real value for customers. The growing diversity of users indicates a much higher demand for administrative, auditing, monitoring and even governance controls that utilize job audit statistics.

- **Geographic Strategy.** Data tracing will become a key requirement in the geographic distribution of data. Development platforms must include the ability to monitor where data originates with jurisdictional cognizance and where it is eventually delivered. Violating national laws through data movement must be addressed and policy-level controls are expected to safeguard the citizen developer and the cloud deployment. The vendor's strategy for expanding its reach into markets beyond its home region/country, and its approach to achieving global presence (for example, its direct local presence and use of resellers and distributors), is critical for capitalizing on global demands for data integration capabilities and expertise.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	High
Offering (Product) Strategy	High
Business Model	Medium
Vertical/Industry Strategy	Low
Innovation	High
Geographic Strategy	Medium

Source: Gartner (August 2016)

Additional information regarding further details of the evaluation criteria can be found in Note 1.

Quadrant Descriptions

Leaders

Leaders in the data integration tool market are front-runners in the convergence of single-purpose tools into an offering that supports a full range of data delivery styles. Additionally, they have recognized the growing affinity between data and application integration, and are haltingly approaching location-agnostic deployments (that are not limited only to cloud or on-premises, but can be deployed beyond specific location). They are strong in establishing data integration infrastructure as an enterprise standard and as a critical component of modern information infrastructure. They support both traditional and new data integration patterns to capitalize on market demand. Leaders have significant mind share in the market, and resources skilled in their tools are readily available. These vendors recognize and design to deploy for emerging and new market demands, (to a large degree) often providing new functional capabilities in their products ahead of demand, and by identifying new types of business problem to which data integration tools can bring significant value. Examples of deployments that span multiple projects and types of use case are common among Leaders' customers. Leaders have an established market presence, significant size and a multinational presence (directly or through a parent company).

Challengers

Challengers are well-positioned in light of the key existing practices in the data integration tool market, such as the need to support multiple styles of data delivery. However, they may be limited to specific technical environments or application domains. In addition, their vision may be hampered by a lack of coordinated strategy across the various products in their data integration tool portfolio. Challengers generally have substantial customer bases, and an established presence, credibility and viability, although implementations may be of a single-project nature, or reflect multiple projects of a single type (for example, predominantly ETL-oriented use cases). Importantly, more than 80% of all end-user organizations in the world still seek batch/bulk processing (even to and within the cloud) — this means that a highly efficient, but batch-oriented vendor can exhibit high execution capabilities without ever crossing to the "right half" of the Magic Quadrant.

Visionaries

Visionaries demonstrate a strong understanding of emerging technology and business trends or focus on a specific market need that is far outside of common practices while being aligned with capabilities that are anticipated to grow in demand. They sometimes lack market awareness or credibility beyond their customer base or a single application domain. Visionaries may also fail to provide a comprehensive set of product capabilities. They may be new entrants lacking the installed base and global presence of larger vendors, although they could also be large, established players in related markets that have only recently placed an emphasis on data integration tools. The growing emphasis on aligning data integration tools with the market's demand for interoperability of delivery styles, integrated deployment of related offerings (such as data integration and data quality tools), metadata modeling, support for emerging information and application infrastructures, and deployment models (among other things) are creating challenges for which vendors must demonstrate vision. With the Leader vendors now addressing big data and data virtualization needs, focusing on these capabilities is still highly advantageous, but no longer specifically differentiating on the "right half" of the Magic Quadrant.

Niche Players

Niche Players have gaps in both their Completeness of Vision and Ability to Execute. They often lack key aspects of product functionality and/or exhibit a narrow focus on their own architectures and installed bases. Niche Players may have good functional breadth but a limited presence and mind share in this market. With a small customer base and limited resources, they are not recognized as proven providers of comprehensive data integration tools for enterprise-class deployments. Many Niche Players have very strong offerings for a specific range of data integration problems (for example, a particular set of technical environments or application domains) and deliver substantial value for their customers in the associated segment.

Context

Data integration remains central to enterprises' information infrastructure. However, in the age of digital business, along with the growing demand for autonomous and user-initiated algorithmic processes, data integration is feeling pressure to become far more fluid and dynamic. Integration as a postdeployment effort is being replaced by demands for active information management. Applications are no longer permitted to be silos first and integrated second. The question now is, "Will this data be used in adjacent use cases?" The answer is *always* "yes."

Enterprises pursuing frictionless sharing of data are increasingly favoring tools that are flexible in that they can be designed once for delivery across multiple platforms, mixed architectural and broad deployment without significant rework. The market is splitting between these newer expectations and more traditional integration needs for time-to-value demands, integration patterns, optimization for cost and delivery models, and synergies with information and application infrastructures. It is becoming more frequent that organizations may have two integration approaches — exhibiting what may be the most distinctive market with a thorough understanding of bimodal practices. In this environment, it will become increasingly difficult for non-Leaders or non-Visionaries to maintain their position in the market. The demand for easily deployed, basic functionality is accelerating with self-service data preparation demands, and some suppliers will be tempted to and will specifically pursue "down market" sales that have smaller margins. When market demand changes and vendors continue to only enhance established functional requirements, they may find their margins going down even while customer counts go up.

Digital business will intensify data integration challenges. Use cases for generating more business value from an enterprise's information will accelerate the need to connect information across distributed data sources in far more diverse ways than has been the case with the traditional movement of bulk data. New types of data are emerging with the rise of digital businesses, and integration leaders now have to factor these into their data integration strategies. Enabling an integrated digital business will add further complexity to an organization's data integration strategy by requiring a mix of latencies and patterns, as well as hybrid deployments using on-premises and cloud-based models.

Pressures grow in this market as vendors are challenged to address demand trends for innovation with the ability to enhance traditional practices and introduce new models and practices.

Business imperatives to confront new information challenges are driving the need for a realignment of technology vision in this market. Demand trends in 2016 require vendors to increase their flexibility in approaching comprehensive data integration needs, and to demonstrate a balanced alignment to time to value, breadth of data integration functionality, diverse use cases, and quality customer experience.

Buyers increasingly favor tool characteristics that exhibit end-user relevance, flexibility in cost and delivery models, and synergy with information and application infrastructure initiatives.

Importantly, the idea of using smaller, more targeted solutions in data integration practices is permitting tightly focused vendors that do not address the entire functionality spectrum to achieve good market execution. It is now possible for an assembly of creatively priced Visionary providers to combine with scale-oriented pricing of more basic data integration tools to then challenge a Leader. Since data integration is one constant in the IT universe, implementers do not always seek a more "complete" solution because integrating multiple integration tools is the "stock and trade" of the practice, just like integrating data. This is what drives the concept of roles and more-active metadata analysis to be built into the tools.

Market Overview

In 2016, most leading organizations have adopted an approach that splits the traditional integration demands away from those needed for integrating data and processes with both their partners and increasingly with their customers. The result is that many organizations have two distinctive integration architectures and design approaches. Traditional integration still makes up the bulk of the delivery in the market (easily more than 80% of all organizations significantly use bulk/batch). But while many organizations have the traditional solutions in place, modern demands have increased the utilization of message, virtualization and synchronization so that in a composite, somewhere between 30% to 45% of all organizations are using at least two of these other approaches — and an even higher percentage of leading or large organizations are doing so. Distributed mobile devices, consumer apps and applications, multichannel interactions, and even social media interactions are driving these organizations to build highly sophisticated integration architectures that can just as easily be a simple data transfer protocol to a fully contextualized data service that delivers single data points through streams of information in near real time (see "The State and Future of Data Integration: Optimizing Your Portfolio of Tools to Harness Market Shifts" and "Use Data Virtualization to Help Resolve Data Silos").

Gartner estimates that the data integration tool market was worth approximately $2.8 billion in constant currency at the end of 2015, an increase of 10.5% from 2014. The growth rate is above the average for the enterprise software market as a whole, as data integration capability continues to be considered of critical importance for addressing the diversity of problems and emerging requirements. The total market revenue is expected to be about $4 billion in 2020 (see "Forecast: Enterprise Software Markets, Worldwide, 2013-2020, 2Q16 Update").

The following trends reflect a shift in demand from buyers in 2016, as well as areas of opportunity for technology providers to deliver thought leadership and innovation to extend this market's boundaries:

- **Align application and information integration infrastructure.** The expansion of vendors' capabilities into application integration provides opportunities to use tools that exploit common areas of both technologies to deliver shared benefits, such as use of CDC tooling that publishes captured changes into message queues. Organizations have begun to pursue data integration and application integration in a synergistic way, to exploit the intersection of the two disciplines. Aligned application integration and data integration infrastructure, deployed for the full spectrum of customer-facing interactions and a broad range of operational flows, gradually optimize costs and shared competencies, as compared with the pursuit of disparate approaches to similar or common use cases (see "Converging Data and Application

Integration: A Step Toward Pervasive Integration Using a Hybrid Integration Platform"). This combined capability is referred to by Gartner as hybrid integration platforms (HIPs).

- **Growing interest in business moments and recognition of the required speed of digital business.** In the context of digital business, "business moments" — opportunities of short duration or a point in time that sets in motion a series of events involving people, business and things — are increasingly attracting the attention of enterprises. They want to harness data to seize these moments, which will require data integration support. Data integration functionality provided in a "sandbox" to support analytics is of growing interest; this approach enables data to be delivered and manipulated in a physical or virtual manner, for ingestion regardless of where it resides; it also encourages experimentation with, and the building of, new models with which to use data of interest. As pressures for real-time data integration grow, organizations will need to manage a range of data latencies to make data available for use within acceptable service levels and to match the required speed of business.

- **Intensifying pressure for enterprises to modernize and enlarge their data integration strategy.** Organizations are increasingly driven to position data integration as a strategic discipline at the heart of their information infrastructure — to ensure it is equipped for comprehensive data capture and delivery, linked to metadata management and data governance support, and applicable to diverse use cases. In addition, implementations need to support multiple types of user experience via tool interfaces that appeal not only to technical practitioners but also to people in business-facing roles, such as business analysts and end users. Offerings that promote collaboration between business and IT participants are becoming important as organizations seek adaptive approaches to achieving data integration capabilities.

- **Requirements to balance cost-effectiveness, incremental functionality, time to value and growing interest in self-service.** Organizations are now seeking cost and deployment options that balance the traditional demands with more modern infrastructure architectures. Buyers conscious of the shift toward distributed "everything" are taking a targeted approach by acquiring only what they need now, while evaluating future data integration needs and how well vendor product roadmaps line up with those needs. Vendors have responded to this development in various ways, such as by varying their pricing structures and deployment options (open-source, cloud and hybrid models), and extending support for end-user functions so that they work with targeted data of interest, especially when requirements aren't well-defined. This approach of utilizing limited functionality or mixing different tools from various vendors based on functionality is referred to as "best-fit engineering."

- **Expectations for high-quality customer support and services.** Buyers are demanding superior customer service and support from technology providers. In addition to highly responsive and high-quality technical support for products, they want direct and frequent interactions with sales teams and executives. Buyers also want wide availability of relevant skills — both within a provider's installed base and among system integrator partners — and forums where they can share experiences, lessons and solutions with their peers.

- **Need to blend traditional deployments with modern infrastructure practices.** The need to support operational data consistency, data migration and cloud-related integration is prompting more data integration initiatives than before. The architectural approach of the logical data warehouse (LDW) optimizes the integrated repositories so they can be combined with new data types using federation/virtualization capabilities. Big-data-related initiatives require the use of opportunistic analytics

and the exploration of answers to less-well-formed or unexpected business questions. The distribution of required computing workloads to parallelized processes in Hadoop and alternative NoSQL repositories will continue to advance the ability of data integration tools to interact with big data sources. Another aspect of this is how vendor/suppliers will choose to respond. A large part of the market will continue to pursue physical consolidation of data and the minority of organizations will seek to augment this with virtualization, message queues and data services buses. Synchronization specialists will be a solution for physically distributed but consistent database deployments.

- **Interim steps to combine cloud and on-premises deployments on the way to 2025.** Adoption of a hybrid approach is increasing in the wake of the "cloud first" focus of some digital business strategies, which emphasizes the use of "lightweight" technologies that are user-oriented and adaptable to change. Historically, data management and integration techniques change in eight-to-10 year cycles (data integration tools took nine years to overcome custom-coding; data warehouses took 11 years to become mainstream; NoSQL has taken approximately from 2005 to 2015 to become mainstream). IT professionals like to imagine them going faster, but the recent Hadoop experience was open-sourced in 2005 and the big data phenomenon emerged around 2011 and was developed for more than 10 years before it was open-sourced. This means that "hybrid" is an interim term and will eventually give way to data integration approaches that dynamically reconfigure their optimization and delivery strategy regardless of deployment locations — even migrating themselves to new locations in the expanding, distributed computing infrastructure as we head toward 2025.

Acronym Key and Glossary Terms

BI	business intelligence
CDC	change data capture
CRM	customer relationship management
DBMS	database management system
EDI	electronic data interchange
EIM	enterprise information management
ELT	extraction, loading and transformation
ESB	enterprise service bus
ETL	extraction, transformation and loading
HDFS	Hadoop Distributed File System
HL7	Health Level Seven International
iPaaS	integration platform as a service

JDBC	Java Database Connectivity
JMS	Java Message Service
JSON	JavaScript Object Notation
LDW	logical data warehouse
MDM	master data management
ODBC	Open Database Connectivity
ODI	Oracle Data Integrator
REST	representational state transfer
SaaS	software as a service
SOA	service-oriented architecture
SOAP	Simple Object Access Protocol
SSIS	SQL Server Integration Services (Microsoft)
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TCO	total cost of ownership

Evidence

The analysis in this Magic Quadrant is based on information from a number of sources, including:

- Extensive data on functional capabilities, customer base demographics, financial status, pricing and other quantitative attributes gained via an RFI process engaging vendors in this market.

- Interactive briefings in which the vendors provided Gartner with updates on their strategy, market positioning, recent key developments and product roadmap.

- A web-based survey of reference customers provided by each vendor, which captured data on usage patterns, levels of satisfaction with major product functionality categories, various nontechnology vendor attributes (such as pricing, product support and overall service delivery), and more. In total, 398 organizations across all major regions provided input on their experiences with vendors and tools in this manner.

- Feedback about tools and vendors captured during conversations with users of Gartner's client inquiry service.

- Market share estimates developed by Gartner's Technology and Service Provider research unit.

Note 1

Detailed Components of the Evaluation Conditions

Gartner has defined several classes of functional capability that vendors of data integration tools provide to deliver optimal value to organizations in support of a full range of data integration scenarios:

- **Connectivity/adapter capabilities (data source and target support).** The ability to interact with a range of different types of data structure, including:

  - Relational databases

  - Legacy and nonrelational databases

  - Various file formats

  - XML

  - Packaged applications, such as those for CRM and supply chain management

  - SaaS and cloud-based applications and sources

  - Industry-standard message formats, such as electronic data interchange (EDI), Health Level Seven International (HL7) and Society for Worldwide Interbank Financial Telecommunication (SWIFT)

  - Parallel distributed processing environments such as Hadoop Distributed File System (HDFS) and other NoSQL-type repositories, such as graph, table-style, document store and key-value DBMSs

  - Message queues, including those provided by application integration middleware products and standards-based products (such as Java Message Service)

  - Data types of a less-structured nature, such as that associated with social media, web clickstreams, email, websites, office productivity tools and content

  - Emergent sources, such as data on in-memory repositories, mobile platforms and spatial applications

  - Screen-scraping and/or user interaction simulations (for example, scripts to interact with the web, 3270, VT100 and others)

- Data integration tools must support different modes of interaction with this range of data structure types, including:

  - Bulk/batch acquisition and delivery

  - Granular trickle-feed acquisition and delivery

  - Change data capture (CDC) — the ability to identify and extract modified data

  - Event-based acquisition (time-based, data-value-based or links to application integration tools to interact with message request/reply, publish/subscribe and routing)

  - **Data delivery capabilities.** The ability to provide data to consuming applications, processes and databases in a variety of modes, including:

    - Physical bulk/batch data movement between data repositories, such as processes for ETL or extraction, loading and transformation (ELT)

- Data federation/virtualization

- Message-oriented encapsulation and movement of data (via linkage with application integration tool capability)

- Data synchronization when distributed datasets must resolve data collisions resulting from distinct changes in disparate copies of data to retain data consistency

- Replication of data between homogeneous or heterogeneous DBMSs and schemas

- Migration of data across versions of data repositories (such as databases, file systems, and so on) and applications (resolving logical differences to achieve physical migration)

- In addition, support for the delivery of data across the range of latency requirements is important, including:

  - Scheduled batch delivery

  - Streaming/near-real-time delivery

  - Event-driven delivery of data based on identification of a relevant event

  - **Data transformation capabilities.** Built-in capabilities for achieving data transformation operations of varying complexity, including:

  - Basic transformations, such as data-type conversions, string manipulations and simple calculations

  - Transformations of intermediate complexity, such as look-up and replace operations, aggregations, summarizations, integrated time series, deterministic matching and the management of slowly changing dimensions

  - Complex transformations, such as sophisticated parsing operations on free-form text, rich media and patterns/events in big data

  In addition, the tools must provide facilities for developing custom transformations and extending packaged transformations.

  - **Metadata and data modeling support.** As the increasingly important heart of data integration capabilities, metadata management and data modeling requirements include:

  - Automated discovery and acquisition of metadata from data sources, applications and other tools

  - Discernment of relationships between data models and business process models

  - Data model creation and maintenance

  - Physical-to-logical model mapping and rationalization

  - Ability to define model-to-model relationships via graphical attribute-level mapping

  - Lineage and impact analysis reporting, in graphical and tabular formats

  - An open metadata repository, with the ability to share metadata bidirectionally with other tools

  - Automated synchronization of metadata across multiple instances of the tools

  - Ability to extend the metadata repository with customer-defined metadata attributes and relationships

- Documentation of project/program delivery definitions and design principles in support of requirements definition activities

- A business analyst/end-user interface to view and work with metadata

- **Design and development environment capabilities.** Facilities for enabling the specification and construction of data integration processes, including:

  - Graphical representation of repository objects, data models and data flows

  - Management of the development process workflow, addressing requirements such as approvals and promotions

  - Granular, role-based and developer-based security

  - Team-based development capabilities, such as version control and collaboration

  - Functionality to support reuse across developers and projects, and to facilitate the identification of redundancies

  - A common or shared user interface for design and development (of diverse data delivery styles, data integration and data quality operations, cloud and on-premises environments, and so on)

  - A business analyst/end-user interface to specify and manage mapping and transformation logic through the use of end-user functionality for data integration/preparation

  - Support for testing and debugging

- **Information governance support capabilities (via interoperation with data quality, profiling and mining capabilities with the vendor's or a third party's tools).** Mechanisms to work with related capabilities to help with the understanding and assurance of data quality over time, including interoperability with:

  - Data profiling tools (profiling and monitoring the conditions of data quality)

  - Data mining tools (relationship discovery)

  - Data quality tools (supporting data quality improvements)

  - In-line scoring and evaluation of data moving through the processes

- **Deployment options and runtime platform capabilities.** Breadth of support for the hardware and operating systems on which data integration processes may be deployed, and the choices of delivery model — specifically:

  - Mainframe environments, such as IBM z/OS and z/Linux

  - Midrange environments, such as IBM System i or HP Tandem

  - Unix-based environments

  - Windows environments

  - Linux environments

  - On-premises (at the customer site) installation and deployment of software

- Hosted off-premises software deployment (dedicated, single-tenant implementation)

- Integration platform as a service (iPaaS), consumed by the customer completely "as a service" — the vendor provides cloud infrastructure; the customer does not install and administer the software

- Cloud deployment support (requires organizations to deploy software in cloud infrastructure); importantly, ability to design once but deploy across multiple or even hybrid/mixed environments, on-premises, in the cloud, or both

- In-memory computing environment

- Server virtualization (support for shared, virtualized implementations)

- Parallel distributed processing (such as Hadoop, MapReduce, leveraging Spark or Yarn)

- **Operations and administration capabilities.** Facilities for enabling adequate ongoing support, management, monitoring and control of the data integration processes implemented by the tools, such as:

- Error-handling functionality, both predefined and customizable

- Monitoring and control of runtime processes, both via functionality in the tools and through interoperability with other IT operations technologies

- Collection of runtime statistics to determine use and efficiency, as well as an application-style interface for visualization and evaluation

- Security controls, for both data in-flight and administrator processes

- A runtime architecture that ensures performance and scalability

- **Architecture and integration capabilities.** The degree of commonality, consistency and interoperability between the various components of the data integration toolset, including:

- A minimal number of products (ideally one) supporting all data delivery modes

- Common metadata (a single repository) and/or the ability to share metadata across all components and data delivery modes

- A common design environment to support all data delivery modes

- The ability to switch seamlessly and transparently between delivery modes (bulk/batch versus granular real-time versus federation) with minimal rework

- Interoperability with other integration tools and applications, via certified interfaces, robust APIs and links to messaging support

- Efficient support for all data delivery modes, regardless of runtime architecture type (centralized server engine versus distributed runtime)

- The ability to execute data integration in cloud and on-premises environments, as appropriate, where developed artifacts can be interchanged, reused and deployed across both environments with minimal rework

- **Service enablement capabilities.** As acceptance of data service concepts continues to grow, so data

integration tools must exhibit service-oriented characteristics and provide support for SOA, such as:

- The ability to deploy all aspects of runtime functionality as data services (for example, deployed functionality can be called via a web services interface)

- Management of publication and testing of data services

- Interaction with service repositories and registries

- Service enablement of development and administration environments, so that external tools and applications can dynamically modify and control the runtime behavior of the tools

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.
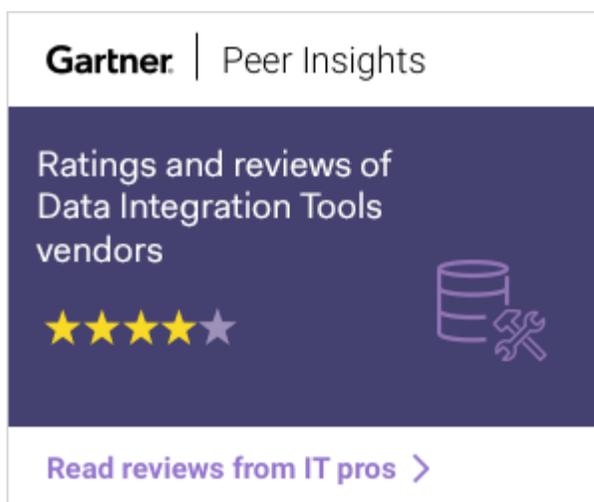
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