Magic Quadrant for Cloud Database Management Systems

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The cloud DBMS market remains as vibrant as ever and is transforming in important ways, especially in the use of GenAI and how DBMSs interact with other data management components. This Magic Quadrant will help data and analytics leaders make the right cloud DBMS choices in this essential market.

Market Definition/Description

Gartner defines the market for cloud database management systems (DBMSs) as the market for software products that store and manipulate data and that are primarily delivered as software as a service (SaaS) in the cloud. Cloud DBMSs may optionally be capable of running on-premises, or in hybrid, multicloud or intercloud configurations. They can be used for transactional and/or analytical work. They may have features that enable them to participate in a wider data ecosystem. They typically persist data using proprietary components in a durable manner, enabling a full range of create, read, update and delete operations.

Cloud DBMSs help organizations execute business processes and the analysis of those processes. They support transactional and/or analytical processing for the following use cases:

- **Online transaction processing (OLTP) transactions:** Support centralized transaction focus, with a fixed, stable schema, that should provide high speed, high volume, concurrency controls, data insert/update, atomicity, consistency, isolation and durability (ACID) properties, transaction isolation, and security.
- **Lightweight transactions:** Support very high volumes of simple transactions with high concurrency, low latency and potentially relaxed consistency. This can include the ability to process fast-moving events captured from the edge.
- **Application state management:** Supports modern end-user experiences by managing users' session state at scale and providing rich user profiles, while also offering variable consistency mechanisms across the database. Provides the ability to support variable and complex schemas across multiple applications and developer teams.
- **Enterprise data warehouse:** Manages data from multiple sources in a highly structured schema to meet analytical demands. It provides predictable performance for both batch and interactive queries.

- **Lakehouse:** Manages the variety and volume of data of variable structures across a wide range of analytical query workloads ranging from traditional analytics to data science. Data may be physically distributed.
- **Event analytics:** Manages data that is written at high frequency and volume. Queries are made in real-time for both evaluation of data against models as well as event summarization. The same data is also queried at later times for ad hoc investigative and discovery as well as model training. In all cases, data is mixed in structure and size. Predictable performance and availability are critical for both ingest and querying.

A cloud DBMS must support at least one of the use cases listed above.

Mandatory Features

- Availability as SaaS on provider-managed public or private cloud systems.
- Management of data within cloud storage — that is, cloud DBMSs are not hosted in infrastructure as a service (IaaS), such as in a virtual machine or a container managed by the customer.
- The ability to persist data, provide full create, read, update and delete (CRUD) operations, and provide durability of data across time.
- The ability to persist data within storage controlled by the cloud DBMS itself, rather than the ability to handle data “in flight.”
- The ability for cloud DBMSs to stand in their own right as data management components that store, read, update and manage data. This is in contrast to systems embedded within other software, such as business intelligence tools.
- The ability to support transactional or analytical database operations, or both.
- The ability to manage instances and resources, monitor and audit operations, and track and implement security.
- The ability to monitor and control costs by using throttling, or workload or user prioritization.

Common Features

- Support for multiple data models and data types — relational, nonrelational (document, key value, wide column, graph), geospatial, time series and others.
- Cloud DBMSs are delivered as SaaS that may also additionally be deployable on-premises.
- The ability to participate in a broader data ecosystem.
- Provide AI, machine learning (ML) and GenAI capabilities, either by itself or through interoperation with other services. We expect this area to have a major impact on data management going forward, aiding ease of use and productivity for system users. These capabilities can be used as outward-facing services for end users. Alternatively, they can be inward-facing and used within the DBMS itself to aid performance, configuration, development etc.

- The ability to automatically handle different types and sizes of workloads simultaneously and efficiently, while enforcing, or dynamically extending, policy-based resource limits. It can also handle varying and conflicting workloads, while optimizing response times, and prioritize the workloads to meet policy-defined service levels. This capability also includes the ability to elastically scale resources dynamically to address both concurrency and query scope variability.
- The ability to read, write and utilize data stored in open table formats or by utilizing open table APIs most commonly used in enterprises.
- Advanced capabilities to support a wide variety of data types for both storage and query, as well as advanced support to aid analysis of such data. This includes support for document types, continuous streams, various multimedia formats, embeddings and other data types.
- The ability to perform support transactions on any of the individual nodes within the distributed database system.
- The ability to access data outside of the internal storage of a database management system and optimize distributed access by a variety of methods, such as push-down, extended metadata, statistics collection and catalog federation, among others.
- The ability to support complex relational operations involving one or many tables that include composite, derived, single and multivalued attributes.
- The ability to optimize performance for queries, transactions and workloads to meet performance and budget goals without manual intervention or management. This can include the availability of performance-enhancing features as well as pricing and packaging options, enabling management of variable and unpredictable workloads within less variable budgets.
- The ability to deploy and operate analytic and operational activities across multiple cloud environments and on-premises.

Magic Quadrant

Figure 1: Magic Quadrant for Cloud Database Management Systems

Gartner

Vendor Strengths and Cautions

Alibaba Cloud

Alibaba Cloud is a Leader in this Magic Quadrant. Its proprietary DBMS offerings include PolarDB, AnalyticDB, Tair, Lindorm, MaxCompute and Elastic MapReduce (EMR), covering transactional, analytical, streaming and multimodal data management workloads. The vendor also offers Data Management (DMS) for data integration and governance, which is natively integrated with its DBMS products. Alibaba Cloud's operations are based mainly in China, but it also has a presence in Japan and other parts of the Asia/Pacific region, Europe and North America, and is expanding toward the Middle East and South America. In November 2023, Alibaba Group canceled its plan to spin off its cloud business, so it will continue to own Alibaba Cloud and its DBMS business.

Strengths

- **Enhanced global partner ecosystem:** Since the last Magic Quadrant, Alibaba Cloud has developed new global partner collaborations with Salesforce, Neo4j, TiDB by PingCAP, Milvus, and others. The enhanced partner ecosystem, strong open-source community participation and branding successes (such as its involvement in the Paris 2024 Olympic Games) have helped its global business growth.

- **Price competitiveness:** Alibaba Cloud has lowered pricing across many product lines since the last Magic Quadrant, including DBMS pricing by 18%. This and continuous innovations in serverless, data compression and Smart-SSD often mean that Alibaba Cloud offerings are less expensive than comparable ones from competitors.

- **Broad and differentiated vertical presence:** Its flagship DBMS solutions, PolarDB and AnalyticDB, have been successful in a range of industries, including finance, retail, gaming and automotive, as well as in the public sector. At the same time, Lindorm and DMS play a vital role in some data-intensive use cases such as autonomous driving and GenAI-driven business applications.

Cautions

- **Limited availability outside Asia:** Alibaba Cloud still has fewer regions and availability zones outside Asia than the market leaders. This complicates client workloads if they have high-availability demands or need geographic distribution. It also impedes the ability of global clients to deploy Alibaba Cloud's offerings for their mission-critical applications.

- **Cost management complexity:** Cost management is complex because the company offers a variety of pricing models together with decoupled resource calculation for more price flexibility. In client inquiries, customers reported challenges balancing cost with performance and transitioning between different pricing models, as well as a shortage of support or service partners to address these issues.

- **Geopolitical challenges:** High geopolitical tensions impact Alibaba Cloud's ability to expand globally, especially in North America. These tensions result in concerns about data security, data sovereignty and other local digital compliance matters. It also limits engagement with NVIDIA and ARM in the AI/ML infrastructure ecosystem.

Amazon Web Services

Amazon Web Services (AWS) is a Leader in this Magic Quadrant. It is the world's most broadly adopted cloud service provider (CSP) and offers a wide range of cloud DBMS services. AWS database services cater to multiple workloads such as transactional, operational, analytical and streaming applications. The vendor offers a complete set of purpose-built database choices, including Amazon Relational Database Service (RDS), Amazon Aurora, Amazon DynamoDB, Amazon DocumentDB, Amazon Neptune, Amazon ElastiCache, Amazon Timestream, Amazon Keyspaces, Amazon MemoryDB and Amazon Redshift. AWS provides these across the globe through its own staff, dedicated industry teams and service delivery partners.

Strengths

- **Market leadership:** AWS has extensive database offerings, strategic partnerships with other providers, a global presence and community of partners, and integrated solutions with third-party tools and services.

- **Extensive choice:** The vendor provides a range of purpose-built database services with a GenAI-powered assistant to help support the development and deployment of modern database-centric applications. It

supports many choices, including relational, key value, document, in-memory, graph, time series and wide column.
- **Enhanced integration across database services:** AWS has improved its integration within and across its broad data landscape. It does so through data services connectors to external data sources; zero extract, transform, and load (zero-ETL) services across several of its databases; and multiple native data integration services. It offers frictionless data movement and end-to-end governance across the data ecosystem.

Cautions
- **Limited hybrid and multicloud offerings:** AWS's strategic focus on, and expansion of, cloud services and capabilities has led to rapid innovation and growth within its ecosystem, but this has also limited its emphasis on hybrid and multicloud offerings. AWS offers native connectors, support for broadly adopted open-source engines like Apache Spark and open table formats like Apache Iceberg across on-premises and other clouds. Even so, some of its customers still rely on third-party solutions for orchestration of data-spanning hybrid and multicloud environments.

- **Integration complexity:** Customers can find it hard to choose the optimal services from AWS's broad range of products. Through offerings such as its Zero-ETL set of integrations, and its new, next-generation Amazon SageMaker unified platform, AWS has been working to make it easier for customers to manage the complexity of the overall cloud data platform.

- **Enhanced data ecosystem support:** Choosing an IT provider inevitably leads to some level of stickiness and dependence. However, customers should evaluate this within the broader context of the entire end-to-end data ecosystem deployment. While AWS is consistently enhancing its services to increase openness, modularity and convergence in cloud data management, it still needs to make further improvements to provide a fully comprehensive and cohesive data ecosystem for its customers.

Cloudera

Cloudera is a Visionary in this Magic Quadrant. Cloudera runs on AWS, Google Cloud Platform (GCP) Microsoft Azure, bare-metal infrastructure, and in hybrid cloud and multicloud environments. The data ecosystem comprises distributed storage and processing layers with multiple engines to support transactional, analytics, streaming and AI workloads. Cloudera continues to drive its open-source leadership, with open standards delivering portable data and AI services across all cloud data architectures. With a centralized control plane and a unified governance platform across all cloud and on-premises environments, it delivers integrated security, metadata and governance with applied observability and an open data ecosystem. Cloudera serves multiple industries and geographies.

Strengths
- **Open source/open standards:** Many vendors in this research are substantially committed to open-source projects, but the breadth and scale of Cloudera's involvement are notable and span more than 35 Apache projects. Customers committed to open source will appreciate this track record.

- **Hybrid capabilities:** Cloudera supports both on-premises and cloud usage within a single deployment, with the same runtimes available to all environments, along with a single management backplane and tooling for replication and federation. Although some vendors offer deployment to multiple environments, and can deploy some workloads in a hybrid manner, Cloudera's comprehensiveness for this, even at petabyte or exabyte scale, is a strength.

- **Licencing flexibility:** Cloudera's pricing model enables customers to use its technology across both public and private clouds, regardless of purchase channel. Some vendors offer this capability for some of their products, but Cloudera's model offers significant flexibility through its scope, enabling customers to significantly evolve architectures and workloads without adjusting contracts.

Cautions

- **Competitive pressures:** Cloudera, while growing, has not kept up with the market's overall growth rate. Despite having significant capabilities in both lakehouse and data science, Cloudera's growth rate lags the cloud service providers as well as the cloud-only third-party analytics solutions.

- **Complexity:** Gartner customers report that Cloudera can require significant implementation effort and ongoing management compared with competing cloud-native offerings. This complexity reduces its flexibility, increases costs and poses some skills retention/acquisition risks.

- **Cost increases:** Although Cloudera has stated an intent to move customers from older to new SKUs without negative impact, many longtime customers have reported, via Gartner client inquiries, significant price increases.

Cockroach Labs

Cockroach Labs is a Niche Player in this Magic Quadrant. CockroachDB is a cloud-native distributed transactional DBMS. It provides resilience, scalability and consistency for modern cloud-native applications across distributed environments. Cockroach Lab's database platform as a service (dbPaaS) deployment option is available on AWS, GCP and Microsoft Azure, while its self-hosted offering can be run on-premises; in hybrid, multicloud; and in intercloud deployments. Cockroach Labs has customers in industries including high tech, finance, retail and gaming. Its business is mainly in North America and Europe, but it also has a presence in the Asia/Pacific region and Latin America.

Strengths

- **Leading distributed SQL:** Cockroach Labs has retained its leading position in distributed SQL. Its continuous innovations in automated resilience, declarative data placement and scalability make it suitable for data-intensive SQL workloads such as payments, identity access management (IAM), user metadata, inventory management and financial trading.

- **Legacy database modernization:** The vendor has invested heavily in modernizing legacy DBMSs. It has enhanced not only DBMS robustness, such as availability, data security and deployment flexibility, but also tools and partner ecosystems for migration. Its new Migrate Off Legacy Technology (MOLT) toolkit helps organizations to modernize by converting schemas and loading data, and by validating queries from legacy DBMSs.

- **Cloud ecosystem engagements:** Cockroach Labs has enhanced its partnerships with AWS and GCP, including not only dbPaaS deployment on CSPs' marketplaces, but also joint innovations with them in hardware optimization, GenAI and industrial applications. CockroachDB is not only deployable, but also cloud-native on AWS and Google Cloud.

Cautions

- **Limited DBMS use cases:** Cockroach Labs continues to prioritize its innovation in OLTP use cases for relational data. Clients that need to sustain different workloads or data models, especially analytical and

AI integration, will likely need to use other solutions alongside CockroachDB.

- **Limited vertical and service adoption:** Cockroach Labs has primarily focused on finance, high tech, retail, e-commerce, media and entertainment, where its offerings are used by strong in-house implementation resources. The vendor has made limited progress in expanding its collaborations with vertical application vendors and service providers. Customers should investigate support available within their vertical as part of their due diligence process.

- **Impacts of license upgrade:** In August 2024, Cockroach Labs announced it was retiring its free, self-managed core product and offering to transition those customers to CockroachDB Enterprise. Although the license change will benefit some clients that qualify for a free upgrade, retirement of the free core product under the Business Source License may have a long-term impact on developer relations and bottom-up innovations from open-source software (OSS) communities.

Couchbase

Couchbase is a Niche Player in this Magic Quadrant. It offers the nonrelational Couchbase database and Couchbase Capella cloud DBMS service. It also offers a self-managed version of both Couchbase Server and Couchbase Mobile, an embedded version of Couchbase for Android, iOS and IoT devices. Couchbase operates mainly in North America, but has a substantial presence in Europe and is growing in the Asia/Pacific region. It is broadly represented across major market sectors, but is particularly strong in large-scale, consumer-facing and back-end enterprise applications. Couchbase Capella provides SQL++, its query language for leveraging developers' familiarity with SQL, while being able to work with JSON document-modeled data.

Strengths

- **Mobile and embedded capabilities:** Couchbase is a leading player in the mobile and edge space, allowing for synchronization with edge data stores even if they are periodically not connected to a central service. This capability is available from server to server, as well as between mobile devices running Android or iOS and servers. Couchbase is unique in its peer-to-peer sync offerings for this market.

- **Strong capabilities for customer experience:** Couchbase Capella offers rich capabilities not typically offered in a single product to address large-scale customer interactions. The combination of a strong cache, SQL++ query language, and document, key value and search models in a single product, all of which are deployable at scale in the cloud and on mobile devices, is powerful and many enterprises use it effectively. Couchbase is widely utilized in both commercial and open-source versions, and it remains one of the most popular database systems for user interaction.

- **GenAI at the edge:** While many vendors evaluated in this research have solutions that span JSON DBMS, text search, vector search, profile management and semantic cache, few of them have a solution deployable as hybrid or intercloud. Leveraging its strength in mobile, Couchbase has a solution that brings GenAI to both the edge and mobile devices within a single platform.

Cautions

- **Competition from CSP-native offerings:** Although customers rate the value of Couchbase's integrated approach highly, many enterprises use separate services across the stack from other providers and find them to be efficient in both cost and development. Increasingly, enterprises can access open-source APIs — such as PostgreSQL, OpenSearch and Apache Kafka, without requiring extensive integration work because the large CSPs provide out-of-the- box, one-click integrations across many of these products.

- **Ecosystem integration:** Couchbase's functionality is narrow compared with that of some other vendors evaluated in this research. This is exacerbated when combined with Couchbase's lack of broad third-party integrations into the more expansive ecosystems offered by many of those other vendors.

- **Market reach and awareness:** After significant time in the market, Couchbase is still not well-known. This is likely to continue given that it competes in a very crowded market with fewer resources in sales and marketing. While this is frequently true of many vendors in the Niche Players quadrant that handle a small set of functions exceptionally well, it often leads to skills availability constraints in the market or increased risk of business disruption when compared to larger companies.

Databricks

Databricks is a Leader in this Magic Quadrant. It offers Databricks Data Intelligence Platform on Alibaba Cloud, Azure, AWS and GCP. Databricks Data Intelligence Platform includes the Databricks Unity Catalog, a metadata catalog, Lakehouse Federation and governance hub. It also offers Delta Live Tables, which simplify and automate ingest and ETL. Databricks SQL provides data warehousing capabilities, and Mosaic AI provides unified tooling to build, deploy, evaluate and govern AI and ML solutions. The vendor focuses on analytical use cases and operates worldwide in many industry verticals.

Strengths

- **Lakehouse vision:** Databricks was the innovator of lakehouse architecture, which combines the capabilities of a data lake and a data warehouse, operating on the same data. The lakehouse benefits include interoperability, operational simplicity, and less data movement or redundancy. The vendor has invested in GenAI, acquiring MosaicML, and is an early adopter in the use of GenAI within data management, including building its own large language models (LLMs). This also reflects its commitment to serverless operation.

- **Unity catalog:** This is a metadata management capability/data catalog that works on top of Databricks. The vendor has announced it would be open-sourced. This provides centralized access control, auditing, lineage, metadata and data discovery capabilities for Databricks tables, files, notebooks, machine learning models and data in federated databases. Unity Catalog has a range of integration points with third-party governance and catalog tools.

- **Open table formats:** Databricks uses the Delta Lake open table format, a specification designed to abstract the logic of data organization, persistence and retrieval in a tabular format. As of this year, the Delta UniForm format can read multiple open table formats.

Cautions

- **Crowded lakehouse market:** Many other vendors in this market have adopted the lakehouse architecture that Databricks pioneered. This means that the lakehouse architecture itself is no longer a differentiator in the DBMS market.

- **Challenges in predicting costs:** Feedback from Gartner inquiry customers suggests that Databricks' pricing model, based on Databricks Units (DBUs), can be hard to understand, track, predict and optimize, especially for irregular workloads. Business users often find Databricks' cost management tools and underlying system tables difficult to navigate. To address this, Databricks has released Cost Dashboard, Cost Genie and Budget Alerts. Gartner recommends that prospective buyers ensure they become familiar with the use of these features.

- **UI inconsistencies:** Feedback from Gartner client inquiries and reviews on Gartner's Peer Insights suggest that end users do not find Databricks' UI to be user-friendly. Lack of low-code capabilities, frequent updates and changes to the UI, and the absence of timely and proper documentation add to the frustration. Organizations that use UI automation tools for testing or workflow management often find that their scripts have to be rewritten because of UI changes.

EDB

EDB is a Niche Player in this Magic Quadrant. It offers EDB Postgres AI, a fully managed PostgreSQL implementation in the cloud. EDB Postgres AI runs on AWS, Microsoft Azure, GCP and Alibaba Cloud. It can also run in distributed mode as EDB Postgres Distributed (PGD) and can be deployed on-premises. It is a unified data platform for transactional, analytical and AI workloads, powered by an enterprise-grade Postgres engine. EDB is a major supporter of the open-source movement and provides a large proportion of the contributions to the PostgreSQL codebase. EDB serves customers in a range of industries worldwide, with a primary presence in North America and Europe, and some presence in the Asia/Pacific region.

Strengths

- **Leading Postgres vendor:** EDB is highly regarded for its Postgres deployments. It supports additional functionalities such as advanced data types, transparent data encryption, autonomous database capabilities and integration with enterprise tools, on top of standard Postgres. There is a general surge in interest in PostgreSQL compatibility to provide wider choices in migration strategies; this can only help EDB and make it more widely used.

- **Developer support:** EDB benefits from an active community of developers who continuously contribute to ongoing development and innovation. This community plays a significant role in ensuring that EDB's offering remains a viable enterprise Postgres solution by delivering frequent updates, features and bug fixes.

- **Migration from Oracle:** EDB provides the necessary tools and features to support migration from Oracle, such as compatibility modes, migration tools, and support for Oracle-native functions and syntax. In Gartner client inquiries, EDB clients reported minimal downtime, a smooth experience and overall satisfaction as they migrate from the Oracle Database.

Cautions

- **Large-scale deployment challenges:** EDB Postgres AI is better-suited to small and midsize deployments, although the system size it can support is growing. For larger and more demanding deployments, prospective customers should do due diligence testing on scaling, availability and other nonfunctional requirements.

- **Increasing competition:** PostgreSQL continues to grow in popularity both as a DBMS and as an interface-compatibility option from other DBMSs. This is because it provides many exit and migration strategies. This will drive competition from vendors that can provide the compatible interface without necessarily providing the database itself.

- **Performance issues:** In Gartner inquiries, some EDB clients mentioned performance issues when compared with standard PostgreSQL. They suggested that factors contributing to this included additional configurations, proprietary extensions and increasing resource utilization because of added enterprise features.

Google

Google is a Leader in this Magic Quadrant. It provides database services including AlloyDB for PostgreSQL; Cloud SQL for PostgreSQL, MySQL and SQL Server; Spanner, which includes Graph and multimodel capabilities; Bigtable; BigQuery; BigLake; Dataproc; Firestore; and Firebase Realtime Database. Each Google Cloud database service is tailored to different needs and use cases, with integrated AI capabilities using vector and LangChain to build enterprise GenAI applications. Google database services provide integration within GCP, on-premises and other external cloud providers. Google operates in many industries and globally (except for China).

Strengths

- **Strong and demonstrated DBMS growth:** Google continues to experience strong DBMS market share, with the largest growth and highest year-over-year growth among the leading providers in recent years. Google has also demonstrated equal growth in both relational and nonrelational databases.
- **Unified and governed data and AI foundation:** Google delivers unified data and an AI foundation across its database portfolio with its DBMS offerings interoperating with Dataplex to organize, manage and govern its data and AI artifacts. It also supports automated data discovery, data classifications, metadata management, and governance of structured, semistructured and unstructured data to support business decisions and AI-related search capabilities. This provides initial support for data fabrics and data ecosystems.
- **Innovation through AI and open source:** The vendor has built a strong reputation for its research and innovation projects, strategic partnerships, and contributions to open-source database technologies such as Postgres, showcasing its differentiation and collaboration. Google has expanded its capabilities with Gemini for AI-assisted database management. It has also introduced vector search support through LangChain integration across its data cloud portfolio, enabling the development of enterprise-scale GenAI applications.

Cautions

- **Focused portfolio of offerings:** Google Cloud offers a focused set of DBMS data management services, with little overlap compared to other vendors. Its CDBMS services integrate with other CSPs and third parties, including prebuilt connectors for popular SaaS applications; however, the vendor's options for native application integration or master data management services are limited compared with others.
- **Tracking spending:** Google enables its customers to track and manage their database spending and tools for optimizing costs by allocating resources automatically and providing granular resource-level cost data out of the box. However, some customers raise concerns about DBMS services and those interfacing to them, such as Dataflow, having compute units that are abstract and difficult to understand, which makes it hard to track overall spending. It should be acknowledged, however, that this is common to many CSPs. Additionally, its FinOps Hub allows customers to balance rate and usage optimizations across their DBMS portfolio.
- **Partner ecosystem:** Google Cloud has a strong and growing ecosystem of partners and continues to expand. However, Gartner inquiries suggest that Google should continue to develop its ecosystem to gain further traction in the enterprise market, encouraging more prospective customers to consider Google as their top choice.

Huawei Cloud

Huawei Cloud is a Challenger in this Magic Quadrant. Its major DBMS offerings include GaussDB and TaurusDB for relational use cases, Data Warehouse Service GaussDB (DWS) for analytical use cases and GeminiDB for multimodal use cases as well as other relational database services. It also offers data management tools that are compatible with its DBMSs, including Data Ingestion Service (DIS), Data Replication Service (DRS) for data integration, DataArts LakeFormation for metadata management and DataArts for data and AI governance. Huawei Cloud operates mainly in China. It also has a substantial presence in the rest of the Asia/Pacific region, the Middle East, Africa and Latin America. Its clients span a variety of industries such as telecom, healthcare, finance and insurance, as well as the public sector. In addition to public cloud, Huawei Cloud also focuses on providing a comprehensive hybrid deployment environment for a full range of DBMS clients.

Strengths

- **Track record in mission-critical workloads:** Huawei Cloud's flagship DBMS solutions, GaussDB, TaurusDB and GaussDB (DWS), have a track record of sustaining mission-critical applications, such as ERP, core transactions and mission-critical data warehouses. These solutions are used mainly by banks and hospitals that need a high level of data consistency and availability.

- **Highly differentiated geographical presence:** In addition to China, the vendor is well-positioned to serve customers in the Middle East, Central Asia, Latin America and Africa. It has grown strongly in these regions since 2022. Customers in these regions are less sensitive to geopolitics but have a strong demand for high-performance and cost-effective databases.

- **Hardware independence:** Huawei Cloud has been developing its own line of processors, including the Kunpeng series for general-purpose computing, and Ascend Cloud Service for AI and machine learning tasks. These are all compatible with GaussDB and bring hardware flexibility to customers that use Huawei's DBMSs.

Cautions

- **Geopolitical tensions and international sanctions:** The geopolitical situation prevents customers in North America and Europe from choosing Huawei Cloud. Data sovereignty concerns exist, as do international sanctions in chips and software ecosystem engagements. This makes it hard for the vendor to market its products effectively in North America and Europe.

- **Lack of multicloud/intercloud capabilities:** Huawei Cloud lags behind other prominent CSPs in capabilities for multicloud/intercloud data management, such as intercloud data integration and federated analytics. This limits Huawei Cloud's DBMS and data and analytics capabilities if clients have deployments in other CSPs.

- **Configuration complexity:** Feedback from Gartner client inquiry customer indicates that they require additional expertise in both DBMS configurations and application development to realize GaussDB's full benefits and performance. Although the vendor offers strong on-site support for its core DBMS customers, support for most general customers is insufficient to address this complexity.

IBM

IBM is a Leader in this Magic Quadrant. IBM offers a broad portfolio of fully managed, scalable and highly available database-as-a-service offerings. IBM leads with Db2 for transactional/operational workloads, and watsonx.data for analytics workloads, both available on IBM Cloud and across other hyperscalers. IBM also offers a full set of managed, general-purpose and purpose-built database services on IBM Cloud, including PostgreSQL, MySQL, MongoDB, Redis and Elasticsearch. IBM has unified its data and AI platform under the watsonx brand, with watsonx.ai, watsonx.data and watsonx.governance providing integration, lakehouse, modern AI capabilities and AI governance in a complementary and integrated manner. IBM operates globally across all industries and organization sizes. It addresses both operational and analytical use cases.

Strengths

- **Suitability for mission-critical applications:** IBM Cloud is suitable for mission-critical applications globally. It features high concurrency, flexible scaling, low latency, cross-region disaster recovery, multiple availability zones and data-driven security, all built on decades of innovation.
- **Data management strategy:** IBM has modernized its data management strategy by emphasizing cloud-native and hybrid cloud database deployments joined together by Db2, Netezza, watsonx and open interface standards in a multicloud and cloud-agnostic manner. This combines its mature enterprise data management capabilities with its open-source expertise and leadership. It has also expanded managed database services, offering flexible deployments and integration with containerized environments.
- **Support for vertical industries:** IBM databases effectively support different vertical industries through industry-specific solutions and frameworks that have been customized for unique sector requirements. The vendor has enhanced its security, compliance, audit and governance to ensure that its solutions meet stringent regulatory standards across various industries globally.

Cautions

- **Establishing differentiation:** IBM offers decades of experience and expertise in helping customers run mission-critical workloads — from small organizations to large enterprises. IBM sometimes struggles to message and leverage this effectively.
- **Communication of strategy:** IBM has made great improvements to its data management strategy and approach to market. However, IBM still has a large and complex portfolio of products and services, and the way it communicates its strategy is not uniformly distributed across the sales teams. Customers and prospects need to research this thoroughly and ensure they have the full, current and correct view.
- **Product availability:** IBM customers deploy database products like Db2 as self-managed software across all of today's major hyperscalers. While IBM does have a roadmap to deliver its database products across all major hyperscalers, prospective customers should check that the desired IBM product is, or will be, available in a suitable region (including for disaster recovery coverage) when they need it.

InterSystems

InterSystems is a Challenger in this Magic Quadrant. It offers InterSystems IRIS Cloud SQL, IRIS Cloud IntegratedML, and a variety of solution-focused cloud services, all built on IRIS, its distributed multimodel data platform. They are available across AWS, Microsoft Azure and GCP; and run on Kubernetes. While traditionally deployed on-premises, InterSystems grew its cloud revenue more than two times the overall market rate in 2023. It is very well-established in the healthcare industry and also has a significant number of customers in supply chain, finance and manufacturing. InterSystems provides support for both operational

and analytical use cases. It operates worldwide, predominantly in North America, Europe and the Asia/Pacific region.

Strengths

- **Customer satisfaction:** InterSystems' customer satisfaction is notable for its depth and breadth. According to feedback from Gartner client inquiries, it retains its customers at a level above most vendors. Beyond customer service, customers praise the continued innovation of the platform and its ability to continue to scale and handle new challenges.

- **Strength in healthcare:** Gartner client inquiries continue to show customer reliance on the support and functionality that InterSystems offers for key healthcare concerns, including graph-based support for the Fast Healthcare Interoperability Resources (FHIR) standard API for sharing healthcare data. The vendor has developed strong capabilities for using GenAI in healthcare records, one of the most high-value and sensitive of all GenAI use cases. InterSystems has a growing recognition in financial services and supply chain.

- **Unified platform:** InterSystems' high degree of integration through the entire application stack — including a single engine supporting both operational and analytic workloads — drives productivity, operational simplicity, and has proven well-suited to both low-latency, high-volume workloads, and complex operational workflows with a combination of analytic and operational requirements. In Gartner inquiries, customers speak positively about the ability to use new functionality without major refactoring or rewrites, even in critical and high-volume applications.

Cautions

- **Limited managed offerings:** Many customers deploy InterSystems IRIS in the cloud, but the vendor's own managed cloud offerings are narrower in scope and function than the core IRIS platform. Although it does allow hybrid or multicloud deployment, InterSystems' approach using Kubernetes requires customers to maintain and manage much of the infrastructure. This is not the case with vendors of most of the other solutions evaluated in this research.

- **Lack of ecosystem integration:** InterSystems has some integration with native AWS data services (including SNS and SQS), but few integration points exist into other vendor ecosystems. Although InterSystems has a complete platform, enterprises that have not selected it as the anchor of their data ecosystem will need to invest more in integration and orchestration than they would in platforms with more extensive ecosystem integration.

- **Steep learning curve:** Reviewers on Gartner Peer Insights continue to report a steep learning curve for InterSystems IRIS. Although the more limited-scope cloud offerings alleviate much of this, most customers require the vendor's help for project success. This means that InterSystems will not be a preferred platform for many efforts led by application developers, even within enterprises already using InterSystems IRIS for mission-critical implementations.

Microsoft

Microsoft is a Leader in this Magic Quadrant. It provides a broad range of cloud DBMS offerings including Azure SQL Database, Azure Database for PostgreSQL, Azure Database for MySQL and Azure Cosmos DB. For analytics, it provides Microsoft Fabric and Azure Synapse Analytics, both integrated data and analytics platforms with built-in DBMSs, and Azure Databricks, based on its OEM partnership with Databricks.

Microsoft is a leading CSP with geographically diversified business operations throughout the world. Its customers are spreading in almost every industry and deployment size.

Strengths

- **Completeness and integration:** Microsoft offers a comprehensive variety of DBMSs spanning mission-critical, data-intensive and AI use cases. These integrate seamlessly with other Microsoft business solutions in Azure, such as Microsoft 365, Dynamics 365 and Power Platform. Many Gartner clients have adopted Microsoft DBMS or data and analytics solutions because of their adaptability to existing Microsoft components. This positions the vendor well in the move toward data ecosystems, particularly the vision for Microsoft Fabric.

- **Multicloud/intercloud data management:** Microsoft is making enhancements to its multicloud/intercloud data management capabilities, such as Azure-Oracle Interconnection for multicloud DBMS deployment and a "shortcuts" function in OneLake in Microsoft Fabric for cross-environment federated analytics. These enhancements benefit clients that need to locate their data in different environments for historical or regulatory reasons.

- **AI investments in data management:** Microsoft remains one of the leading vendors of both AI-augmented data management and GenAI use cases. Its capabilities — such as multiple Copilots for NL2QL, native vector functions built into DBMSs and Azure OpenAI integration with in-built invocations — have lowered user barriers to GenAI for data management and business use cases.

Cautions

- **Overlapping data and analytics offerings:** In Gartner inquiries, many Gartner clients raise concerns about the long-term data and analytics solution viability of Azure Synapse Analytics and Azure Databricks after the introduction of Microsoft Fabric. When clients are deploying or already using one of these data and analytics platforms, they fear it may become "nonstrategic" to Microsoft in the future.

- **Unproven maturity of Microsoft Fabric:** Despite Microsoft Fabric's market traction, Gartner clients report that its DBMSs, data integration, data governance and metadata management capabilities are less technically robust than other leading solutions in the market, which impedes clients moving Fabric to production. Customers should use the more mature components in Microsoft Fabric, such as Power BI, and do thorough proofs of concept with sufficient feature testing before scaling up to other components.

- **Deployment challenges:** Feedback from Gartner client inquiries and Peer Insights reviews indicates that the complexity of tool configuration and shortage of service partners continue to prevent the full realization of the capabilities of Microsoft DBMS products. In particular, they cite availability, disaster recovery, data security/privacy and FinOps capabilities.

MongoDB

MongoDB is a Leader in this Magic Quadrant. It offers the document-based nonrelational MongoDB Atlas on AWS, GCP and Microsoft Azure; the on-premises MongoDB Enterprise Advanced; and MongoDB Community Edition, which is source-available and free to use. MongoDB Atlas and Enterprise Kubernetes Operators enable customers to deploy and manage MongoDB database resources to a Kubernetes cluster. The vendor also offers MongoDB Atlas Charts, Atlas Data Federation, Atlas Search, Atlas Online Archive, Atlas App Services, and Atlas Device SDKs for remote and edge use. It supports application-driven analytics, GenAI and

time series collections, along with full-text search, vector search and stream processing. MongoDB is in wide use in all industry segments and in enterprises of all sizes.

Strengths

- **Transaction processing strengths:** MongoDB is a long-established and mature nonrelational document DBMS. It is well-regarded for high-volume transaction processing, horizontal scalability, replication and flexible schema structure.
- **Flexibility and implementation speed:** MongoDB is popular with developers who value its flexibility and speed of implementation, which enable Agile approaches. MongoDB is well-suited to complex applications.
- **Analytical capabilities:** MongoDB includes analytical capabilities that complement its transactional features, as well as graph and vector functions.

Cautions

- **Limited to nonrelational database services:** MongoDB focuses on nonrelational database services, so may not be appropriate for customers with other use cases.
- **Competitive actions:** MongoDB faces increasing competition from other vendors that have MongoDB compatibility options. The compatibility level of competitors may lag behind that of MongoDB, so prospective customers should look into this.
- **Increased multimodel adoption:** There is increased competition from other multimodel database systems that may include document capability alongside other DBMS models, also from relational database vendors which have added document DBMS functionality.

Neo4j

Neo4j is a Visionary in this Magic Quadrant. It continues to demonstrate its popularity and strength in graph databases. Its features and capabilities make it a preferred complementary solution for many organizations to meet their data-centric application needs. Neo4j provides simplified data movement for integrating and modeling data from other databases. It provides ACID compatibility for transactional support and graph analytics use cases. Neo4j is positioned to address the new wave of AI-ready data demands with the contextual and semantic unification of structured and unstructured data management to support AI explainability and training needs. It also enables what are now being termed GraphRAG architectures. Neo4J operates globally and in a variety of industries including financial services, pharma, supply chain, consumer packaged goods, and U.S. federal.

Strengths

- **Differentiated data operation and retrieval:** Neo4j enables simplified and flexible data management with its graph storage and direct traversal of connected data. It does so by using a property graph model that enables data to be represented as nodes, relationships and properties. It permits flexible data representation and schema evolution, making adding new data types and relationships easier. Neo4j graph structures speed up query performance.
- **Improved GenAI applications accuracy:** Neo4j's graph database can help organize, categorize and classify information, while vectors can identify similar documents and enhance retrieval and ranking. GraphRAG

uses graphs for context and vectors for similarity, making it effective for GenAI applications that require high accuracy.
- **Adoption of graph technologies:** Neo4j demonstrates thought leadership in graph technologies with a comprehensive set of tools for self-service analytics. This includes defining standards with Cypher/openCypher query language for graphs and establishing Graph SQL standards, and using query libraries and visualization tools to navigate and explore data.

Cautions

- **Performance and resource demands:** The data representation in Neo4j is driven mainly by nodes and relationships. As data demands grow, users must store different relationships and combinations that will require significant resources and continuous optimization. Larger applications require careful modeling and capacity planning to optimize resource consumption. This modeling for performance may need special attention. By storing explicit relationships along with nodes, graph databases tend to perform faster than other databases.

- **Growing preference for data ecosystem:** Although Neo4j has partnered with several CSPs and independent software vendors (ISVs), enabling customers to move into an integrated data ecosystem, some customers prefer to use the CSPs graph DBMS offerings when available. In addition, several open-source graph DBMS and analytics products are gaining substantial user bases.

- **Lack of relational capabilities:** Relational and document databases remain the top choice for building complex applications and mainstream reporting. This means that most organizations choose vendors that offer these and in addition include graph functionality.

Oracle

Oracle is a Leader in this Magic Quadrant. Oracle Autonomous Database includes Autonomous Transaction Processing, Autonomous Data Warehouse, Autonomous JSON Database and APEX Application Development (APEX Service). Oracle Exadata Database services are available in Oracle Cloud Infrastructure (OCI), Microsoft Azure, GCP and AWS. Oracle also offers Exadata Cloud@Customer (ExaCC) and OCI Dedicated Region private clouds. The vendor offers Oracle HeatWave MySQL, MySQL, Oracle NoSQL Database Cloud Service, OCI Cache for Redis managed service and OCI Database with PostgreSQL. Oracle is active in all regions, and its database offerings address a variety of vertical industries for both transactional and operational mission-critical implementations.

Strengths

- **Comprehensive multimodel database:** The core Oracle Database product and Oracle's other DBMS offerings provide a wide and rich feature set. The Oracle DBMS has been extended using multiple model paradigms and support for lakehouse architectures. The vendor has a very good track record for extending the DBMS itself and through the addition of complementary surrounding services.

- **Intercloud and multicloud strategy:** Oracle's products are widely available via the main CSPs. In addition, Oracle has pioneered an innovative intercloud and multicloud strategy. It offers Oracle-Exadata-class services within AWS, GCP and Microsoft Azure and through fast communication links or colocation within those CSPs' data centers. This complements and extends Oracle's OCI cloud offerings; it also considerably derisks cloud adoption for Oracle customers. When adopting or moving to a non-Oracle cloud, evaluators should not assume that a DBMS migration is necessary. The access of OCI from AWS, Google and Microsoft clouds provides an alternate approach that can be considered.

- **Fast-paced improvements:** Oracle has an excellent track record of enhancing its database products with modern features as demand for them emerges. Recent examples of new features include multimodel, AI, GenAI, vector processing, document database, low-code capability and distributed database with RAFT consensus.

Cautions

- **Centralized approach:** Oracle adopts a more centralized and tightly integrated approach than other vendors. Prospective customers should ensure that they understand how the function they seek is delivered. However, this will depend on customer perspective, as many see this as a simplification — one database for everything rather than having many different specialist DBMSs.

- **On-premises deployment:** Many of Oracle's customers deploy on-premises, and the vendor still has work to do moving to the cloud. Although migration appears to be smooth, customers moving or expanding into the cloud should ensure that they understand the process.

- **Perception of high cost:** Oracle still suffers from the perception of having high costs in the marketplace. However, greater transparency and a focus on value for money is countering this. Rather than making assumptions, potential customers should ensure that they properly understand and project likely costs to make an informed decision.

Redis

Redis is a Visionary in this Magic Quadrant. Redis Cloud, a fully managed cloud database-as-a-service offering, is available on AWS, GCP and Microsoft Azure. It can also be deployed in on-premises, hybrid and multicloud environments. Redis is an open-source, in-memory data structure store specialized for low-latency and high-speed throughout. It is a multimodel DBMS that specializes in real-time transactional, web and user session management actions, messaging, leaderboard, and ranking system use cases. Redis operates mainly in North America, but also has a substantial footprint in EMEA and the Asia/Pacific region. It has customers in a range of industries.

Strengths

- **Real-time capability:** Redis is well-known for its in-memory data processing, which is widely used to sustain modern real-time use cases in most industries. Redis Cloud is an easy-to-use, well-adopted tool for building responsive applications and includes AI capabilities. The vendor focuses on high-performance use cases and is very broadly adopted.

- **Popularity:** Redis enjoys widespread support at an API layer across many application frameworks and pipelines. Thousands of integrations to Redis exist across commercial and open-source projects. Millions of programmers use it across industries and in organizations of all sizes.

- **TCO and elasticity:** Although many competing vendors offer solutions that are compatible with Redis API, Redis Cloud offers differentiated functionality that drives higher performance and reduces costs. Redis continues to innovate in this area, as evidenced by its prevalent use in reducing LLM costs and latency among many large GenAI applications, as well as offering a strong roadmap.

Cautions

- **Licensing change:** In March 2024, Redis changed from an open-source license to a much narrower "source available" license. Customers may prefer to migrate to newer open-source projects rather than

switch to the new license, and prospective customers may opt to go directly to newer open-source projects.

- **More than caching:** Even though Redis has expanded its functionality substantially, there is still a lack of awareness in the market that Redis is more than a caching solution. However, it is typically used as a component of a data management system rather than a complete data management platform. Customers do not often use it for data warehouse workloads, and it lacks an SQL interface.

- **Ecosystem Integration:** While the Redis API is very popular, customers are increasingly choosing the Redis-compatible services offered by some CSPs. This is because these services are often more tightly integrated with the rest of the data management services on their platforms. Microsoft Azure, however, integrates Redis as a first-party service within its ecosystem.

SAP

SAP is a Visionary in this Magic Quadrant. It offers SAP HANA Cloud and SAP Datasphere. SAP HANA Cloud addresses operational and analytical use cases, supports both transactional and analytical workloads, and includes multimodel support. SAP HANA is the underlying database technology that supports the vendor's core products — SAP S/4HANA Cloud — and also provides the SAP-oriented data warehouse, SAP BW/4HANA. For ecosystem-oriented use cases, SAP Datasphere unifies SAP and non-SAP data, by being able to import non-SAP data and develop functionality using SQL. SAP operates globally from diverse locations. It has enterprise customers of all sizes in all industries. It is supported by Alibaba Cloud, AWS, GCP and Microsoft Azure.

Strengths

- **Comprehensive platform:** SAP HANA includes an array of modern features. These include transactional and analytical processing with SQL data access, AI and machine learning, data governance and transformation, and support for multimodel processing.

- **Well-suited to customers with a SAP-focused ERP strategy:** SAP's data products are highly suited to use in developing systems with SAP data and mixes of SAP and non-SAP data with minimized implementation workloads. This applies to both extensions to ERP and other applications, and stand-alone analysis.

- **Ease of mixing SAP and non-SAP data:** This can be bidirectional, including extraction of SAP data into third-party environments and ingestion of non-SAP data from external environments to allow SQL-based development within the SAP HANA Cloud system. This was a weakness of the system that has now been addressed.

Cautions

- **Limited appeal to non-SAP customers:** However, this part of the market is still substantial and SAP data management products do make sense to SAP customers — either used in conjunction with SAP applications or complementing other data management services.

- **Understanding HANA-based choices:** When used with SAP S/4HANA, ERP customizations can be offloaded from the core ERP system by extending to SAP HANA Cloud instead, without impacting the core ERP system. Much operational reporting reverts to the ERP system. Because SAP customers often have mixed SAP and non-SAP analysis and reporting needs, designers should not assume that these must be done outside the SAP environment. They should understand SAP options for new analytical and reporting requirements, as these requirements may be more effectively met close to the SAP ERP data.

- **Perceived as costly:** Systems based on SAP HANA are often perceived as being expensive but often this is driven by recollections of legacy on-premises HANA systems where all data — including history data — had to be held in memory, thus increasing costs. However, customers should become familiar with the features that affect the price/performance of its current cloud-native successor, SAP HANA Cloud. These include multitier storage and processing, multimodel engines, machine learning/AI, elastic scalability, and support for both transactional and analytical processing in a single system.

SingleStore

SingleStore is a Niche Player in this Magic Quadrant. It offers SingleStore Helios Cloud, a fully managed, on-demand cloud database service that is compatible with the MySQL wire protocol. SingleStore can be deployed on AWS, Google Cloud and Microsoft Azure as well as on private clouds, IBM Cloud, Red Hat OpenShift, and within Snowpark Container Services. For on-premises or self-managed cloud deployments, the vendor offers SingleStore Self-Managed. SingleStore also has a free-for-life version of the database. The industry verticals that typically use SingleStore include financial services and fintech, martech/adtech, media, telecommunications and retail.

Strengths

- **Unified transactional and analytical processing:** SingleStore has an architecture that enables it to run both transactional and analytical workloads within the same database. This unified approach facilitates a consistent view of all data across the organization, making it simpler to understand and analyze. Transaction data is synchronously replicated to the analytical engine, with ACID compliance ensuring that the results of analyses are in line with the latest transactional position. SingleStore's Apache Iceberg support allows tight integration with other analytic platforms that support Apache Iceberg.

- **High performance:** SingleStore achieves high performance and low latency because of its distributed architecture, in-memory technology, parallel processing and advanced query optimization, even for large datasets and complex queries. It works well for critical and time-sensitive use cases such as fraud detection, IoT data processing and real-time trading.

- **Established vector processing:** SingleStore was one of the first databases to incorporate vector capabilities into its core architecture, enabling it to efficiently store, index and query vector data. It has continued to refine and optimize its vector capabilities, which also include exact keyword match, and all are tightly integrated with both transactional and analytical workloads — enabling a single query to perform semantic and lexical search along with aggregate analytics operations across multiple data types.

Cautions

- **Initial setup complexity:** In Gartner client inquiries, customers have suggested that SingleStore platform setup is complex, with limited customer support. However, Helios Cloud, which is a fully managed DBaaS, alleviates the need for customers to configure the database. Customers not using Helios should follow SingleStore's documentation, best practices and guidelines.

- **Resource management:** SingleStore's high performance is directly attributable to the rightsizing of underlying compute resources. Overcommitting resources can lead to underutilization, whereas underprovisioning can lead to performance degradation. Customers should use monitoring tools to track resource utilization and adjust allocation.

- **Lack of global coverage:** Although the vendor has some presence in different regions worldwide, clients report to Gartner that SingleStore's smaller size may limit its ability to widely support customers globally. Multinational companies should evaluate SingleStore's strategy for international expansion, the availability of local partners and resellers across world regions, and its round-the-clock/follow-the-sun support across time zones.

Snowflake

Snowflake is a Leader in this Magic Quadrant. Snowflake AI Data Cloud provides a simplified interconnected architecture across multiple clouds and geographies. Through its data lake, data warehouse, AI/ML and GenAI solutions, Snowflake enables organizations to interoperate their data and AI needs at a global scale, supporting open table formats, unstructured data and access to other data sources. It continues to release new AI/ML capabilities to meet the demands of the market. Snowflake enables the sharing, collaboration and monetization of data assets as well as access to native applications and AI products through its marketplace. It provides a range of services, including container services, providing a unified and single-ecosystem experience for customers to manage and run all their workloads.

Strengths

- **Simplicity:** Snowflake has targeted ease of use as a major design objective and this has driven its popularity. Snowflake has a simple UI and streamlined data and AI operations for various user personas. These features enable users to focus less on the platform and more on extracting data-driven insights.

- **Diverse storage choices:** Snowflake is known for its relational data warehouse, but also supports multiple formats in the cloud objects storage layer, including open-source table format, and a range of nonrelational data formats such as JSON, BSON, AVRO, XML and Parquet. Unstructured data formats (such as text, images, audio and videos) are stored either internally or in the cloud.

- **Extending lakehouse architecture:** Snowflake has extended its lakehouse architecture by embracing Apache Iceberg and an open-source data catalog, Apache Polaris, that drives open standards and offers more flexibility, interoperability and greater control over data for end users. This enables read-and-write access across multiple engines that support Iceberg, so organizations can use a single copy of data across tools without duplication. Likewise, the addition of AI has widened its capabilities.

Cautions

- **Cost forecasting:** As data and workload demands grow, some customers report, in Gartner client inquiries, that they find it challenging to forecast costs. While this is true of many cloud DBMSs, Snowflake's ease of use can make it particularly susceptible. Snowflake now has tools available for cost visibility, controls and performance optimization. Snowflake continues to make progress with financial governance, and customers should ensure that they correctly monitor and forecast the demand on their systems.

- **Limited hybrid support:** Snowflake provides integration with on-premises storage through external tables, which can pose usability challenges for organizations that cannot move all of their data to the cloud because of stringent compliance and long-term infrastructure investments. Snowflake delivers the best when ingesting data into its native storage or through an Iceberg open table format, either natively or through connecting to external object storage volumes. Snowflake cloud-native architecture offers ease of use and scalability for organizations to incrementally move their data by iteratively managing the risks and limitations, integration complexities, and overall cost management.

- **Data-sharing complexities:** Enabling organizations to securely share data with other Snowflake customers, without copying or moving it across different environments, is very useful, but it has limitations. These include read-only access, the inability to reshare data with other consumers, complexities arising from permissions and data sensitivity, and restrictions to certain cloud regions. Customers need to understand and plan accordingly.

Teradata

Teradata is a Visionary in this Magic Quadrant. It offers Teradata Vantage Cloud and focuses on analytics, data warehousing and lakehouse requirements. It also offers the complementary Teradata ClearScape Analytics for in-database analytics and AI/ML use cases. Its products are available via the main hyperscale cloud providers and on-premises. Teradata also provides vertical industry offerings such as Teradata Vantage Industry Data Models (iDMs), including data models for finance, retail, telecommunications, manufacturing and healthcare. The vendor operates worldwide. It has customers of all sizes, and many are large organizations with demanding analytical workloads. Its customers are in a variety of sectors, including retail, manufacturing, telecommunications, healthcare and financial services. Teradata also provides distributed capability via its Teradata QueryGrid feature.

Strengths

- **Feature-rich platform:** Teradata VantageCloud is a feature-rich, mature and robust data and AI platform, and has had a significant presence in the market for 45 years. It has a strong reputation for mission-critical and complex analytics workloads.

- **Deployment options:** Teradata performs well in the cloud, but also runs on-premises and in hybrid environments. This is important for many customers, enabling them to migrate workloads easily as regulatory requirements change.

- **Product enhancements and innovation:** Teradata has a good track record for product enhancement and adopting new technology and techniques. Its AI innovations in Teradata VantageCloud and with the introduction of ClearScape Analytics have enhanced its range of analytical, AI and ML capabilities, including the use of LLMs and vector technologies.

Cautions

- **Perceived higher cost:** Prospective customers should work with the vendor to produce a resource and cost model that reflects their specific needs and to check the level of costs they should expect as their system grows. Customers should then ensure that they are familiar with, and use, Teradata's cost management controls, workload optimization, and pay-as-you-go AI Unlimited engine. This will allow organizations to achieve competitive and predictable costs over time.

- **Availability of skilled practitioners:** Although Teradata is increasing its revenue in the cloud analytical database market, it is not growing at the same rate as the overall market. Any loss of market share may affect the availability of skilled practitioners. Customers should ensure adequate Teradata staffing through suitable recruitment and training, or through services from Teradata or partners.

- **Lack of transactional capabilities:** Teradata specializes in providing products and solutions for analytical workloads and does not offer true transactional workload capabilities. Prospective customers with mixed analytical and transactional workloads may require complementary solutions. However, Teradata can

support large volumes of operational queries from large user populations as part of its mixed workload capability.

Vendors Added and Dropped

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

Added

The following vendors were added this year because they met this Magic Quadrant's

inclusion criteria, including the customer interest index (CII):

- Huawei Cloud
- SingleStore

Dropped

While they met this Magic Quadrant's other inclusion criteria, the following vendors were

not among the top 20 vendors in a CII defined by Gartner for this Magic Quadrant:

- Yugabyte

Inclusion and Exclusion Criteria

This body of research identifies and then analyzes the most relevant providers and their products in a market. Gartner uses by default an upper limit of 20 providers to support the identification of the most relevant providers in a market. The inclusion criteria represent the specific attributes that analysts believe are necessary for inclusion in this research.

Inclusion Criteria

To qualify for inclusion in this body of research, vendors had to meet the following criteria:

- Offer a generally available software product that met Gartner's definition of a Cloud DBMS.
- Support one or more of the following cloud DBMS use cases:
  - OLTP transactions
  - Lightweight transactions
  - Application state management
  - Enterprise data warehouse

- Lakehouse
- Event analytics

- Rank among the top 20 organizations in a customer interest indicator (CII) defined by Gartner for this research. Data inputs used to calculate CII include the following measures, among others:
  - Gartner end-user inquiry volume
  - Vendor mentions in Gartner Peer Insights reviews as competitors
  - Social media followers
  - Gartner.com searches
  - Google Trends (search interest)
  - Web traffic analytics

- Have market presence in at least three of the following regions (regional market presence is defined as the existence of dedicated sales offices or distribution partnerships in a specific region) and a minimum of 5% of the cloud revenue from each region.
  - North America (Canada, Mexico and the U.S.)
  - Central and South America
  - Europe (including Western Europe and Eastern Europe)
  - Middle East and Africa (including North Africa)
  - Asia/Pacific
  - Japan

- Have a cloud DBMS service generally available as of midnight, U.S. Eastern Daylight Time on 1 July 2024. This includes any new functionality added to the service(s) by the specified date. We do not consider beta, “early access,” “technology preview,” or other not generally available functionality or services. Additionally:
  - Any acquired product or service must have been acquired and offered by the acquiring vendor as of 1 July 2024.
  - Acquisitions after this date were considered under their preacquisition identities, if appropriate, and are represented separately until the publication of the following year’s Magic Quadrant and Critical Capabilities research.

Note that analysts may need to update the inclusion criteria as they progress through the research process. You will be explicitly notified of the change(s) should they happen.

Exclusion Criteria

Vendors marketing only products from the list below are explicitly excluded from this Magic Quadrant and Critical Capabilities research.

They include:

- Streaming services, whose use cases are dominated by immediate event processing, and which are rarely — if ever — used for subsequent management of the data involved.
- Prerelational DBMS products.
- Object-oriented DBMS products.
- Data grid products.
- BI and analytical solutions that offer a cloud DBMS that is limited specifically to the vendor's own BI and analytical tools.
- Analytics query accelerators (SQL interfaces to object stores or file systems).
- Vendors of data virtualization, data fabric and data federation that do not provide data persistence of their own.

Honorable Mentions

The cloud DBMS market is large, so there are many additional vendors that may be of interest to readers. While they met our other inclusion criteria, the following vendors were not among the top 20 organizations in the customer interest index (CII) defined by Gartner for this body of research.

Noninclusion due to the CII should not reflect negatively on these vendors or products. The following list does not include all notable vendors absent from this body of research. Gartner clients are encouraged to request inquiry calls to discuss these and other notable vendors.

The list is presented in alphabetical order.

- **Actian:** Beginning with the commercialization of the Ingres database in the 1980s, Actian (now the Data and analytics division of HCLSoftware) provides a wide range of products, with an emphasis on discovery, management and analysis of data. Products include the Zeenea Data Discovery Platform, with a data catalog and enterprise data marketplace, the Actian Data Platform (previously known as Avalanche), relational database management systems Actian Ingres and HCL Informix, NoSQL databases Actian Zen and Actian NoSQL/FastObjects, Actian DataConnect and DataFlow (solutions for integration, data quality and streaming data), and Actian Vector (an in-memory columnar analytics database). Also offered are Actian OpenRoad and Volt MX for object-oriented rapid database application development and low-code application development, respectively. Overall, Actian provides a range of products and solutions that are trusted by customers, flexible (they run on-premises, in the cloud or hybrid), and easy to use. Its products provide an integrated data platform that supports solutions in multiple industries, including manufacturing, finance, healthcare, transportation, logistics, communications and retail.

- **Aiven:** Aiven offers a range of open-source, cloud-based products and services. It operates worldwide. Aiven provides a unified platform to deploy and manage cloud database services including ClickHouse, Apache Cassandra, Apache Flink, Apache Kafka, Redis, InfluxDB, MySQL, OpenSearch, PostgreSQL and the M3 time series database. Its platform, which also supports event streaming, is available on AWS, GCP and Microsoft Azure, as well as several smaller providers. It offers these managed cloud services in its customers' public cloud accounts as well as its own. Aiven focuses on open-source data management services and also makes its own integration software and tools — such as Apache Kafka connectors and a PostgreSQL backup and restore tool — available under an open-source license.

- **ClickHouse:** ClickHouse is an open-source real-time analytical database launched in 2016. It provides ClickHouse Cloud, a turnkey SaaS cloud database based on ClickHouse, designed for analytics, and with an emphasis on online analytical processing and real-time workloads. Built to be particularly good at aggregating and filtering very large volumes of data, ClickHouse achieves high performance using a combination of compression, column-oriented storage, parallel processing, and optimizations for data types and layouts. ClickHouse Cloud is available on AWS, GCP, and Microsoft Azure. Managed ClickHouse services are also available from other cloud service providers, including Alibaba Cloud.

- **Exasol:** Exasol is headquartered in Nuremberg, Germany and provides a high-performance, in-memory analytics engine. Exasol is a specialist vendor focused solely on analytics use cases that helps its clients to accelerate their data warehouse, data lake/lakehouse and AI initiatives. Historically, most of its business has been in Europe, but it now has a presence in North America and the Middle East. Exasol has long-standing experience in data analysis, starting as an on-premises product. Exasol can be used as a stand-alone database or an accelerator for existing data warehouse or lakehouse infrastructures. The vendor offers both provider-managed private and public cloud offerings. Its product provides the main features that customers in this market expect, such as massively parallel processing scalability, in-memory columnar processing, data lake integration, and the ability to work with integrated ML and AI.

- **OceanBase:** OceanBase is headquartered in Beijing, China, and offers OceanBase Database, a distributed transactional database that is compatible with both MySQL and Oracle. Its fully managed cloud database service is available on Alibaba Cloud, AWS, Huawei Cloud and GCP. OceanBase is one of the pioneers of distributed SQL technologies, with strong innovations in performance, elasticity, availability and disaster recovery. Coming from Ant Group, OceanBase was used to sustain many of the group's data-intensive applications such as Alipay. Today, its product is widely used in China by organizations in finance, telecom, energy and the public sector to replace aging mainframe relational databases, especially for mission-critical systems. In 2020, OceanBase was registered as a business entity owned by Ant Group and is now transitioning to be an independent technology vendor. OceanBase started exploring the global market in 2022 but still has a limited presence outside of China at the moment.

- **PingCAP:** PingCAP provides TiDB, a popular open-source, distributed transactional database that is compatible with MySQL. Headquartered in Sunnyvale, California, PingCAP is a global company with regional offices and business in the Asia/Pacific region, Japan, China and Europe. Its commercial solution includes TiDB Cloud Serverless, which is available on all the major public cloud platforms as a fully managed cloud service, TiDB Cloud Dedicated, and TiDB Self-Managed for on-premises and hybrid deployments. TiDB is mainly used for data-intensive applications in industries such as finance, e-commerce, gaming, logistics, and high-tech. It is also used by organizations to modernize mission-critical systems, offering a scalable and distributed alternative to traditional database architectures.

- **Progress (MarkLogic):** MarkLogic was acquired by Progress in 2023. It focuses on solving complex data problems. Its MarkLogic Cloud service is primarily offered on the AWS and Microsoft Azure clouds, and is supported on OpenShift, GCP, Docker Hub and Kubernetes. Progress focuses on data management. It is built around a multimodel data platform and an integration hub. Both the integration hub and the platform enable users to access data stored remotely including support added for RAG for GenAI. The platform can support multiple use cases, data architectures and consumption patterns through the flexible handling of document, semantic, geospatial, time-based, vector, binary and relational data under one security and governance model. Progress added new app development and data visualization capabilities in 2024, the MarkLogic FastTrack, which assists organizations harness the power of connected data. The vendor's MarkLogic operations are primarily in North America and Europe. It has customers in a range of industries, but it is particularly strong in the management of regulated data in the national security, finance, insurance and life sciences sectors. It is active in multiple industries and also addresses needs for data fabric, data hub and enterprise knowledge graph applications.

- **Tencent Cloud:** Tencent Cloud is a leading CSP in China. It offers Tencent Distributed SQL (TDSQL), a distributed transactional database available on both Tencent Cloud and private cloud; and TDSQL-C, a fully managed cloud DBMS service on Tencent Cloud. Its analytical DBMS offerings include TCHouse for data warehousing and Tencent Big Data Suite (TBDS) for unified lakehouse use cases. Its DBMS product family also includes nonrelational products such as CTSDB for time series, KonisGraph for graph, and Cloud VectorDB for vector data management. Tencent Cloud's DBMSs' customer base varies widely and has customers in traditional industries (like government, finance and energy) and highly digitalized industries (like online retail, social media, entertainment and gaming). Its flagship product, TDSQL, is widely used in China to replace legacy global mainframe databases, and has been deployed to sustain mission-critical implementations such as core banking systems. Tencent Cloud also has a global presence outside China, with its main focus on the Asia/Pacific region, Japan and Europe.

- **TigerGraph:** TigerGraph is a private company based in Redwood City, California, that operates in the Americas, Europe and the Asia/Pacific region. It offers a native graph DBMS platform that runs on-premises or as TigerGraph Cloud, a fully managed service supported on AWS, GCP and Microsoft Azure. It also offers TigerGraph Machine Learning Workbench for developing GraphML solutions, and TigerGraph Insights for visualization and self-service graph analytics. The TigerGraph platform is capable of both operational and analytical workloads with real-time capabilities. TigerGraph and its graph-oriented solutions are mainly used for five use cases:

  - Financial crime (uncovering hidden networks of criminals).
  - The connected customer (connecting customers, products and services to optimize personalization and recommendations).
  - Agile operations (analyzing network-shaped data across silos to speed up cross-functional decision making).
  - Support application development in the areas of cybersecurity (through the interconnection of graph entities through dependencies tracking and tracing capabilities).
  - Graph-powered AI applications (for building chatbots, virtual assistants, content generation with graph-based retrieval-augmented generation (RAG) and ML with supervised and reinforcement learning).

- **Yugabyte:** Yugabyte provides YugabyteDB, a modern distributed SQL database with built-in resilience, on-demand scalability, and flexible geodistribution for transactional workloads. Prior to starting Yugabyte, the company's founders had a strong track record building and operating large distributed database systems like Apache Cassandra and HBase for powering applications at Facebook scale. YugabyteDB is a PostgreSQL-compatible, global-scale relational transactional database system. The vendor operates globally, with a presence in many countries and industries. Yugabyte also offers YugabyteDB Voyager, providing tools and services to migrate from PostgreSQL, MySQL and Oracle to YugabyteDB. Deployment options include YugabyteDB Aeon, which can be deployed in main hyperscale clouds (AWS, GCP and Microsoft Azure) or using a bring-your-own-cloud option. An Apache-licensed version of the core engine, YugabyteDB, is available to be downloaded and used.

Evaluation Criteria

Ability to Execute

Gartner analysts evaluate providers on the quality and efficacy of the processes, systems, methods or procedures that enable IT provider performance to be competitive, efficient and effective, and to positively impact revenue, retention and reputation within Gartner's view of the market.

- **Product or Service:** Core goods and services that compete in and/or serve the defined market. This includes current product and service capabilities, quality, feature sets and skills. We looked at products and services that address both operational and analytic use cases. We focused on features influencing performance, scalability, availability, security and integration.
- **Overall Viability:** Business unit, financial, strategy, organization and financials. Overall viability includes an assessment of the organization's overall financial health as well as the financial and practical success of the business unit. Views the likelihood of the organization to continue to offer and invest in the product, as well as the product position in the current portfolio. We use Gartner-published estimates on revenue, as well as our assessment of share of market and trends in revenue. Changes in organization structure, personnel and roadmap are also included.
- **Sales Execution/Pricing:** The organization's capabilities in all sales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support and the overall effectiveness of the sales channel. We also evaluate the variety and suitability of a vendor's pricing models.
- **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 to changing market demands. Timely creation of and fielding of a cloud offering, and competitive feature development and delivery in "cloud release cadence" are considered.
- **Marketing Execution:** The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message in order to influence the market, promote the brand, increase awareness of products, and establish a positive identification in the minds of customers. This "mind share" can be driven by a combination of publicity, promotional activity, thought leadership, social media, referrals and sales activities. We compare the consistency, channels, volume and differentiation of marketing messages heard by prospects to those presented to analysts.

- **Customer Experience:** Products and services and/or programs that enable customers to achieve anticipated results with the products evaluated. Specifically, this includes quality supplier/buyer interactions, technical support, or account support. This may also include ancillary tools, customer support programs, availability of user groups, service-level agreements, etc.
- **Operations:** The ability of the organization to meet goals and commitments. Factors include quality of the organizational structure, skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently.

Table 1: Ability to Execute Evaluation Criteria

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

Source: Gartner (December 2024)

Completeness of Vision

Gartner analysts evaluate providers on their ability to convincingly articulate logical statements. This includes current and future market direction, innovation, customer needs, and competitive forces and how well they map to Gartner's view of the market.

- **Market Understanding:** Ability to understand customer needs and translate them into products and services. Vendors that show a clear vision of their market — listen, understand customer demands, and can shape or enhance market changes with their added vision. We look for vendor awareness of customer

concerns about such issues as price transparency, license portability, migration assessment, execution and cost, security gaps and multicloud, intercloud and hybrid operations.

- **Marketing Strategy:** Clear, differentiated messaging consistently communicated internally, and externalized through social media, advertising, customer programs, and positioning statements. We assess the clarity and consistency of messages that articulate the value of the cloud DBMS, especially as compared both to similar on-premises products where they exist and to other cloud DBMS offerings.

- **Sales Strategy:** A sound strategy for selling that uses the appropriate networks including direct and indirect sales, marketing, service, and communication. Partners that extend the scope and depth of market reach, expertise, technologies, services and their customer base. We evaluate relationships between CSPs, ISVs and SIs, use of app stores and co-marketing, degree of focus on ease of onboarding.

- **Offering (Product) Strategy:** An approach to product development and delivery that emphasizes market differentiation, functionality, methodology, and features as they map to current and future requirements. We evaluate if the product strategy builds on existing product strengths and moves toward addressing emerging market needs. This includes the response to such issues as resource efficiency, CSP-managed instance definitions and availability, and response to security requirements for object storage.

- **Business Model:** The design, logic and execution of the organization's business proposition to achieve continued success. We consider relationships to CSPs, financial model changes, geographic and vertical adjustments driven by cloud opportunities, and design of engineering and support to leverage cloud realities.

- **Vertical/Industry Strategy:** The strategy to direct resources (sales, product, development), skills and products to meet the specific needs of individual market segments, including verticals. We look at breadth and depth of vertical and industry focus. Information on specific successes, in particular verticals or industries, is taken into consideration.

- **Innovation:** Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or preemptive purposes. Innovation is judged based on truly new capabilities or combinations in the market, rather than matching capabilities of existing products from other vendors.

- **Geographic Strategy:** The vendor's strategy in directing their resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography. This can be done either directly or through partners, channels and subsidiaries, as appropriate for that geography and market. We examine such manifestations as local language support, on the ground resources, and marketing focus on multiple geographies.

Table 2: Completeness of Vision Evaluation Criteria

Evaluation Criteria ↓	*Weighting* ↓
Market Understanding	High

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

Source: Gartner (December 2024)

Quadrant Descriptions

Leaders

Leaders generally demonstrate support for a broad range of DBMS use cases, including a mix of operational and analytical processing, based on support for a wide range of data types and/or diversity of deployment models (such as multicloud, intercloud and hybrid). They may support a number of different cloud DBMS offerings. They may represent diverse cloud ecosystems, of which their cloud DBMS is a part, or have good interoperation with such systems. These vendors demonstrate consistently high customer satisfaction and strong customer support. Many have mature products created for the cloud or migrated to be cloud-native. They incorporate or lead advanced features and architectures. Leaders generally represent the lowest risk for customers in the areas of performance, scalability, reliability and support. As the market's demands change, Leaders demonstrate strong vision in support of not only the market's current needs, but also of emerging trends. These include requirements for serverless DBMS and financial governance with effective and understandable pricing models and support for AI/ML and, more recently, GenAI. Finally, the marketing messages, product research and development, and delivery of Leaders suit today's market for public and private cloud services.

Challengers

Challengers are vendors with strong, established offerings, but they are somewhat lacking in vision for the cloud DBMS market. It can be difficult for some vendors to improve both vision and execution at the same time. It is normal for some to have high scores for Ability to Execute one year, and high scores for Completeness of Vision the next. Challengers normally show strong corporate viability and financial stability, and demonstrate strong customer support. However, they lack some features needed to support the latest trends in the cloud DBMS market, such as support for a broad set of use cases or a roadmap for moving to multicloud/intercloud implementations. Although they may be lacking in relation to some of the market's innovative concepts, Challengers have strengths in relation to many of the Ability to Execute criteria. They can become a threat to Leaders by widening their vision and by market innovation.

Visionaries

Visionaries have a strong market understanding and a robust roadmap for the cloud DBMS market. They have innovative ideas about functionality and demonstrate advanced use of new deployment models. They may be young/small vendors and have fewer customers than Leaders. Although lacking the market presence of Leaders, they have the potential for growth in the market due to elements of their vision that are market leading. Alternatively, they may be large companies that have been overtaken in the market by other cloud DBMS providers — but crucially, they retain the potential to regain their former leadership position. Both types of Visionaries can improve their execution and growing market share with innovative ideas that push the market in new directions. Both are a threat to the Leaders.

Niche Players

Niche Players generally deliver a highly specialized product with a particular limited market appeal. Niche Players will not support a massive spread of cloud DBMS use cases, but will support a smaller number of use cases particularly well. They may offer a more restricted range of products. Niche Players may be sizable and financially sound companies but have a particular focus within which they are successful.

Niche Players may lack one or all of the following:

- A strong or large customer base and, consequently, market share.
- The breadth of functionality exhibited by Leaders.
- Penetration of a broad range of industries or geographies.
- Proven, mature products that present low risk.

However, if an organization has a need for the specific set of capabilities that a Niche Player provides, then it can be a good fit.

Context

This Magic Quadrant assesses vendor capabilities on the basis of their execution and vision in 2023 and early 2024 plus their future development plans. Because vendors and the market are evolving, the assessments may be valid for a limited duration. Readers should not use this Magic Quadrant in isolation as a tool for selecting vendors and products. They should treat it as one reference point among many required to identify the most suitable vendor and product.

We also recommend using Gartner's client inquiry service for a more detailed discussion of technology choices. In addition, we recommend referring to Gartner Peer Insights for peer comments on products and services, available on gartner.com.

2020 was the first year that Gartner combined the assessment of vendors offering analytical DBMS and vendors offering operational DBMS. This was in line with the observation that the database market was converging, with vendors providing solutions for both types — sometimes with the same product, and sometimes with separate products. In 2023 and 2024, this trend has become stronger. Although it is advantageous for a vendor to address both operational and analytical use cases, it is not essential. A vendor can still be a Leader if it serves its single chosen market particularly well.

The evaluation of the vendors in the Magic Quadrant is relative, not absolute. Typically all vendors advance from year to year — the Magic Quadrant is a snapshot of their new relative positions. If a vendor's dot appears to go down or to the left in a year, it usually does not mean that it has degraded its execution or vision. Usually, it means that the vendor advanced but other peer vendors advanced more. The overall aggregate capability of the market represents major new capabilities for organizations.

This Magic Quadrant evaluates vendors that supply fully managed cloud DBMS services (dbPaaS offerings) for some or all operational and analytical use cases. This includes data and analytics leaders such as heads of data management, CIOs, CTOs, CDAOs, infrastructure managers, database and application architects, database administrators, IT purchasing managers — and, increasingly, business leaders who are involved in acquiring cloud DBMS technology.

Market Overview

This Magic Quadrant covers cloud DBMS services. That is, database management systems providers of products that are managed services offered as a dbPaaS. Those successful in this market will typically have one or more database services in the cloud, a good market presence, good growth, and good differentiation. The cloud DBMS market is mature, and core function is increasingly commoditized, but there is still innovation in the increasingly rich surrounding functions. Newer functions often appear in how the cloud DBMS interoperates with other data management functions and expands their scope — moving toward participating or driving the move to data fabrics and data ecosystems. Increasingly, organizations choose a vendor based on its data persistence model, the strategic vision of the vendor and — most importantly — the ability of the vendor's products and services to work with other adjacent components of a data fabric or data ecosystem.

Market statistics are:

- The overall DBMS market grew by 13.4% in 2023, reaching $103.2 billion.
- The nonrelational DBMS and relational DBMS (RDBMS) segments grew by 21.8% and 11.3% respectively. While the nonrelational segment is the fastest growing segment, it should be noted that RDBMS accounted for 78% of the DBMS market in 2023, the same as in 2022.
- Cloud bpPaaS captured the majority of the gain, with cloud spend (61%) exceeding on-premises (39%).
- The only primary software market segments exceeding DBMS's 2023 growth were analytic platforms at 14.4%, networking software at 15.6% and supply chain management software at 13.7%.

For further market information, see **Forecast Analysis: Database Management Systems, Worldwide, 2023**.

Gartner forecasts that dbPaaS spend will be 78% of the market by 2028, with the hyperscaler share of that being 82%. That said, the on-premises share is still growing — even while its percentage of the total market shrinks. This means that an on-premises/hybrid solution still matters and will continue to matter to a substantial subset of the market.

There is also a small countertrend for "repatriation," to move back to on-premises to achieve fixed costs, privacy, local data sovereignty or other regulatory or operational reasons. Vendors need to keep an eye on their on-premises strategy and not neglect it. This repatriation countertrend is not expected to reverse the main move to the cloud. The bulk of the market is transferring to cloud, but some organizations see interoperation with on-premises as an essential part of that strategy.

This market continues to evolve rapidly. Cloud DBMSs are developing in the direction of support of and interoperation with the broader data ecosystems. Cloud DBMSs are not fully subsuming the functionality of surrounding data management components, rather, they are increasingly interfacing and interoperating with them. Metadata and catalog usage for lineage and governance span vendor products, and even extend into other clouds and vendor products.

Open-source software (OSS) also has developments in both directions.

- Almost 90% of the vendors executing above the DBMS market average have an OSS offering. PostgreSQL looks to be outrunning MySQL in new implementations.
- Having a Postgres-compatible API strategy is doing well for vendors with customers who like the migration and exit strategies that it offers.
- A recent research circle survey showed that 62% of the data in enterprises is managed by proprietary DBMS software, and 38% by OSS, which remains a minority usage scenario.

AI and GenAI: Most vendors are bundling GenAI functionality into their existing products rather than creating new products to sell. Support for vectors as a native data type to support AI use cases (including GenAI), AI assistants and natural language querying being good examples.

AI-driven data management is another key trend as it provides higher and higher degrees of automation. This automation applies within the DBMS to help with its operation, management and tuning. Note that a lot of this is the "traditional" AI and machine learning, rather than the newer GenAI. AI is also being used in outward-facing functions (for example, recommending data to users).

GenAI is causing a major transformation with the CDBMS market (as elsewhere) and this will continue. It is not simply a fad, although we expect an eventual reset to more pragmatic expectations once the hype has died down. GenAI functions are becoming expected features rather than a major differentiator as users expect GenAI to be used and vendors expect to supply it. It is not clear whether it will make a major difference to revenue in the near term, but the features enabled by it will increasingly be required by purchasers.

Some GenAI use cases are already well-established, including AI assistants for development, natural language querying, configuration design as well as text-to-SQL (and vice versa), lineage analysis, data discovery, business-context generation. GenAI will make a good contribution to database migration tooling, making it easier to translate complex code from one system to another. If migrations can be done faster, cheaper and with less risk, their ROI will grow and become much easier to justify. It may also be possible for systems to automatically design interfaces for each other, making system integration much easier. Another possibility is that releases of CDBMSs will become faster due to development productivity increases. Expect further developments in the practical use of GenAI. This is not a fad.

Relational and nonrelational databases: RDBMS products continue to strengthen their nonrelational DBMS (RDBMS) feature sets, for example adding JSON support or distributed RAFT replication. This increases the competition for the nonrelational DBMS vendors. However, Gartner is still projecting a 2028 nonrelational DBMS (NRDBMS) market that is the size of the total 2020 DBMS market. This shows how the overall market has grown and the NRDBMS market within it. Nonrelational processing has truly taken its place within or alongside traditional RDBMS offerings and should be considered by any organization wishing to establish a modern-data management strategy.

Data ecosystem support: Regarding the support for data ecosystems, we see nondatabase vendors starting to encroach onto the DBMS space, offering SQL query access to data lake and other data, even if they don't support other DBMS functions such as backup/restore, disaster recovery, etc. Likewise, CDBMSs are able to interoperate with these tools through federation (the inclusion criteria for this research excludes nondatabase vendors from being considered). There is a trend toward using ELT, replication and streaming to ingest data in a bronze/staging layer and rely on the lakehouse/warehouse computational capabilities for transformations. CDBMS vendors may incorporate some functionality such as data transformation, data quality and low-code development. Evaluators should consider not just data management stand-alone products, but how they collaborate.

Lakehouse: For analytic systems the Lakehouse architecture has been taken up by most vendors. Open table formats like Iceberg and Delta Lake are able to hold the data in a more efficient and structured form. Also, there are initiatives to allow access through single interfaces. Data lake vendors are adding SQL engines to allow them to handle interactive query loads. The lakehouse now does a good job of data replication and fast ingestion. However, the lakehouse architectures still have work to do regarding the handling of interactive, real-time workloads and more-intensive SQL workloads. Buyers should move toward the lakehouse architecture, but exercising due diligence.

Convergence of transactional and analytic processing. Gartner continues to see a convergence of operational and analytical systems. This may be through collaboration rather than full integration. This is being achieved by three viable approaches: (1) One database and one copy of data; (2) one database but with two engines, one row-based, one column-based, integrated and synchronized; (3) two or more databases that are designed to synchronize and work together.

This is a steppingstone toward Gartner's articulated vision of the data ecosystem. Increasingly, applications and data components will be seamlessly integrated. The key advice here is to anticipate and benefit from the increasing merging of transactional and analytical systems.

Distributed transactional databases: On the transactional database side, there is increased acceptance of distributed database management systems. These have had a healthy presence in China for several years, but not so much in the rest of the world. This was driven by the very large volumes of users and processing in that market. Geopolitics was a major factor in inhibiting their sales globally. Now that hyperscalers and other vendors are offering these, they are becoming more mainstream. RDBMS vendors are also adding distributed capabilities. Aside from their ability to handle large groups of users and high throughput applications, they simplify high availability, disaster recovery and the ability to dynamically move workloads and thus are becoming more attractive. Distributed databases and functionality are now increasingly accepted within the market and buyers should consider them for mainstream use (and no longer see them as esoteric alternatives).

Egress charges: It has been Gartner's view for a while now that cloud egress charges are likely to go away, eroded through competition. We are starting to see this occurring more with collaborative agreements between clouds starting to emerge, where cloud providers agree to allow data access between their clouds without incurring egress charges. It is suggested that this be explicitly considered when choosing a cloud and the DBMS within it.

Next: Data fabric and data ecosystems: The marketplace is preparing for the next major shift — the data fabric and then the full data ecosystem. There is movement toward universal access to data through open standards. There is also a trend toward using AI to both manage the internal workings of the data management system and to help users discover, manage and use data. Some database functions are becoming commoditized, with many choices being good enough to meet the needs of the majority of customers, thus providing wide choice and increased ability to swap systems in and out. There is a move toward using metadata to manage and use data within and between systems. Metadata and governance components are now becoming the focus of competition. Likewise, the increasing integration of transactional and analytical systems suggests the emergence of a data fabric as a layer above the individual systems. In turn the data fabric will enable the implementation of the data ecosystem where multiple data storages, systems and applications communicate freely. The role of the CDBMS to provide vital components of the data fabric will set its direction.

This is a very dynamic market with movement in many different directions. The cloud DBMS will continue to be useful for many in the market simply as a database to serve applications. It will also expand its role both as a participating component in an enterprise data fabric or data ecosystem or potentially as the central controlling and driving hub of such systems — or networks of such systems.

Acronym Key and Glossary Terms

CDBMS	Cloud DBMS
DBMS	Database management system
Lakehouse	An architectural design approach based on expanding a data lake so that it can run the workloads originally covered by both the data warehouse and the data lake
NRDBMS	Nonrelational database management system
RDBMS	Relational database management system

Evidence

This research is partly based on Gartner client inquiry service data recorded from June 2023 through June 2024.

Market Share: Database Management Systems, Worldwide, 2023.

Forecast Analysis: Database Management Systems, Worldwide.

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.