

# Denodo Global Cloud Survey Report 2022



### Sponsored by:







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The cloud is no longer the future; the cloud is now.

In 2021, due the pandemic, we saw many organizations pivot to online-only models, and we saw traditional, brick-and-mortar businesses, like restaurants, take on online services to manage orders and deliveries. The cloud was a cornerstone for much of this activity, and companies of many stripes appreciated – and then relied upon – the cloud's ability to scale as needed to support the peaks and troughs of a rocky, unpredictable market.

In these first few months of 2022, we are seeing these trends continue. The pandemic, no longer a zero-day unknown yet still far from over, worldwide, is serving as a reminder that the cloud is not just a convenient fallback for providing services in an uncertain world, it is a necessity for maintaining flexibility on an ongoing basis.

Cloud-enabled business transformation has become a priority as organizations face global supply chain issues, cybersecurity threats and geopolitical instability. Organizations of all sizes and vertical markets are turning to cloud to ensure flexibility and resilience in the face of these challenges. Small to medium sized businesses, in particular, have driven investment in cloud infrastructure services to support workload migration, data storage services and cloud-native application development.

In the Denodo Global Cloud Survey 2022, we surveyed over 150 individuals at organizations in a range of industries, and in a range of different phases of their cloud journeys.

We wanted to know their challenges, what drove them to the cloud, and what they hoped to gain from the cloud. We wanted to know how these companies would leverage cloud technologies in their data integration, data management, and analytics workloads. We examined what types of initiatives they were engaged in currently, and what types of initiatives they were planning for the future. As our respondents are also potential customers of cloud technologies and services, we also wanted to learn about their evaluation and selection criteria, preferences, and purchasing processes.

As expected, in our 2022 survey, we saw wider adoption of cloud technologies. We also saw increased interest in reporting, dashboarding, and self-service data access, indicating that now that the vendors have been chosen and the migrations are complete, organizations are now working out how they are going to get the right information into the right hands at the right time, so that they can use their new cloud capabilities to meet their critical needs in a highly unpredictable business world.

#### **KEY TAKEAWAYS**

Cloud technology has evolved to become a standard component of the modern data infrastructure. Organizations are now concerned about managing their new cloud systems to make the best use of their data. The results of the Denodo Global Cloud Survey 2022 provide key insights, such as:

Cloud adoption continues its rapid climb, building on the sustained interest in cloud technologies as pandemic-driven changes in data consumption and delivery become standard. This year, far fewer companies are watching from the sidelines, as most have engaged in some form of cloud activity, and many have achieved considerable maturity, with 54% of responses either at an intermediate or advanced level.

For the third year in a row, hybrid cloud with 37.5% of responses, stands out as the top deployment model. This underlines the fact that on-premises systems do not simply sit idle when companies adopt cloud technology. Companies have many good reasons, regulatory compliance among them, for not simply abandoning on-premises systems when the technology landscape changes. Modern data-management approaches like logical data fabric enable organizations to seamlessly accommodate legacy systems so that they can work in tandem with cloud systems.

For years, Microsoft Azure and Amazon Web Services (AWS) have dominated the cloud market, and in 2020 and 2021 Azure was a nose ahead of AWS. This year, AWS takes back its lead over Azure.

The role of IT in the cloud modernization journey has changed. Last year, their focus was choosing the cloud provider and managing the migration. This year, they're getting trained to take their organization's cloud systems to the next level. This brings self-service data access closer to business stakeholders. As this study shows, the top-two use cases for cloud technologies are reporting and dashboards, and self-service BI and ad hoc analytics.

Cloud-based data warehouses, data lakes and lake houses played a prominent role this year, cited as a top initiative (by 48.2% of respondents) and a top use case (by 57.3% of respondents). Having migrated key workloads to the cloud, clearly a next step for many companies is finding a place to store the new data they then begin to acquire.

#### **Characteristics of Respondent Companies**

This study surveyed over 150 companies across a wide range of industries including software/IT, financial services, and healthcare (for a detailed demographic breakdown, see the Methodology section), the respondents included Cloud/Data Architects (25%), various engineering roles (12.55%) and C-Suite executives(11.31%), with the rest of the respondents coming from areas such as data science, business analysts and lines of business leads.

This first section of questions illustrates the essential characteristics of these companies in terms of their chosen provider and deployment model. It also captures where these companies are in their adoption cycles, and the roles of each individual respondent in the cloud-technology buying process.



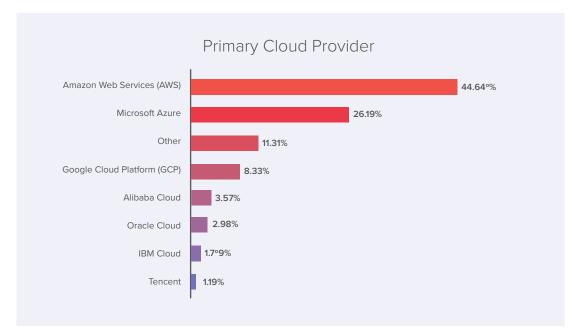
Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

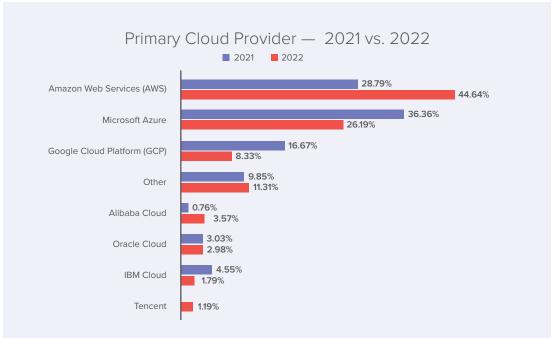
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# Cloud Deployment, Provider, and Roles

#### **Chosen Cloud Provider**

Microsoft Azure and Amazon Web Services (AWS) continue to dominate the market by a wide margin, but this year, AWS has jumped ahead of Azure with a substantial lead, after Azure has kept just ahead of AWS for two consecutive years. Confidence in Google Cloud Platform (GCP) lagged this year, as the platform was chosen by 14.9% in 2021 but by only 8.3% this year. Alibaba, in contrast, showed a bump from 1.4% in 2021 to 3.6% this year.



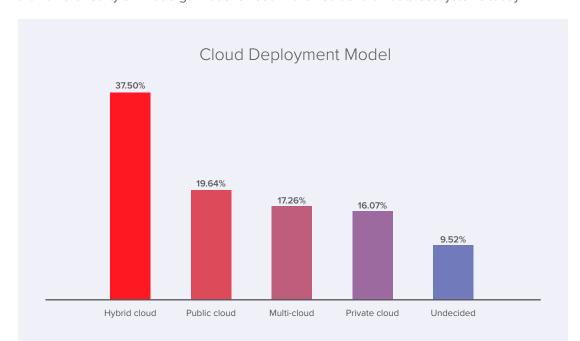




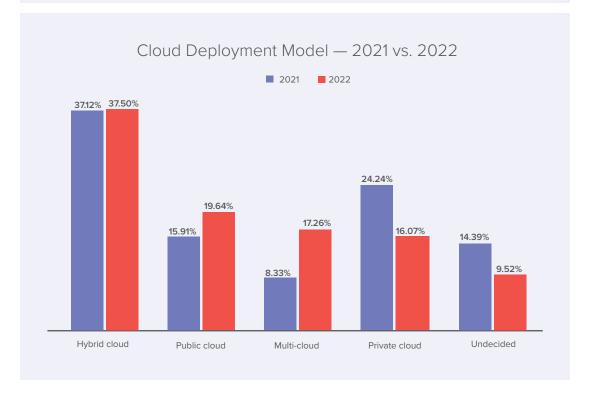
Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

#### **Deployment Model**

Hybrid cloud continues to be the deployment model of choice, as it has been since the 2020 survey, but this year, the gap between hybrid cloud and private cloud, the second choice, is dramatically wider, with hybrid cloud chosen by almost twice the number of respondents (37.5%, compared with pure public cloud, at 19.6%). This year, it is clear that hybrid cloud is less a "choice" than a hard reality of what organizations need in the heart of their data ecosystems today.



Hybrid cloud continues to be the deployment model of choice, as it has been since the 2020 survey

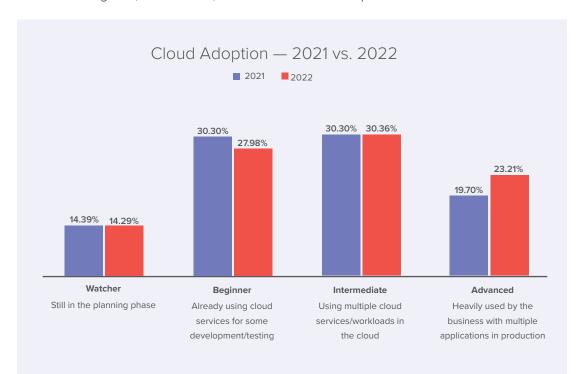




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#### **Cloud Adoption Maturity**

Cloud adoption maturity continues to rise, with a tad fewer Watchers and slightly increased numbers of Beginner, Intermediate, and Advanced cloud adopters.



Cloud adoption maturity continues to rise



Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven



## Cloud Adoption, Drivers, and Challenges

This next set of questions looks at cloud adoption and its related dimensions: What drives organizations to adopt cloud technologies, and what gets in their way?

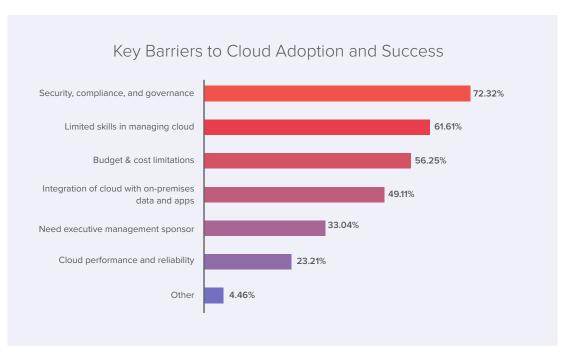
#### **Key Barriers to Cloud Adoption and Success**

Though most organizations are engaged with cloud technology and have reached more mature phases in their cloud journeys, barriers remain. In fact, the barriers have remained fairly consistent, with Security, Compliance, and Governance still the top concern (identified by 72.2% of respondents), followed by Limited Skills in Managing Cloud Systems (61.6% of respondents), however the market is actively responding to this, with global systems integrators building cloud center of excellence practices with tens of thousands of certified and skilled cloud engineers, this is being driven by the adoption of cloud technologies in the small to medium enterprise sectors.

Security, compliance, and governance will always be a challenge when first migrating to the cloud, as organizations will need a bird's-eye view across both on-premises and cloud systems, simultaneously, and will need seamless ways to implement security and governance protocols across both systems. Fortunately, modern strategies like logical data fabric can address these needs.

Similarly, it will always be challenging, at first, to manage cloud systems, especially when these systems are new additions to the data infrastructure, which is often the case. Cloud systems and on-premises systems cannot be easily managed together, without implementing the right strategies, and once again logical data architecture can play a role, in this case easing the management of cloud and on-premises systems, simultaneously.

Global systems
integrators
are building
cloud center
of excellence
practices with
tens of thousands
of certified and
skilled cloud
engineers





Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

#### **Key Motivations in Adopting Cloud Technologies**

Challenges aside, organizations continue to adopt cloud technologies, stick with them, and work with them until they become organic components of modernized infrastructures. Despite the inevitable challenges, cloud technology has numerous well-known benefits, including the simplified scaling of performance and storage, when and as needed, depending on business needs. What are the main benefits that driving organizations to move workloads to the cloud in 2022?

The top-two benefits that are motivating organizations to adopt cloud technologies are On-Demand Performance and Scalability (chosen by 67% of respondents) and Reducing Data Center Maintenance and Operational Costs (59.8% of respondents). These two were chosen by a wide margin over the rest.

This suggests that organizations are still drawn by the basics: Improving performance while holding down costs. Fortunately, these are the two areas in which cloud technologies shine.



Performance, and cost are two of the main driving factors for cloud adoption







Usage for Data Integration, Management, Analytics



#### The Role of IT in the Company's Cloud Strategy

In the 2021 survey, respondents told us that the primary roles of IT were to Choose the Cloud Provider and Plan for the Migration. A close second was Getting Trained to Support Emerging Cloud Needs. In this year's survey, these two roles remain important at numbers two and three, but Training to Support Emerging Cloud Needs has moved to the top, with a 6.25% lead over choosing the cloud provider.

This data reflects the higher maturity of companies in their cloud journeys over last year. Many companies have already chosen their provider and begun the migration. Now, they need to use the cloud to their best advantage, and this means moving on to launching activities to address key use cases. IT is no longer the "hired hand" of business; IT is a friend of the business, building bridges between IT, the lines of business, and executive management.



IT are onboard
with cloud
adoption and
are investing in
training to support
the businesses
cloud needs



Top Initiatives

Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven



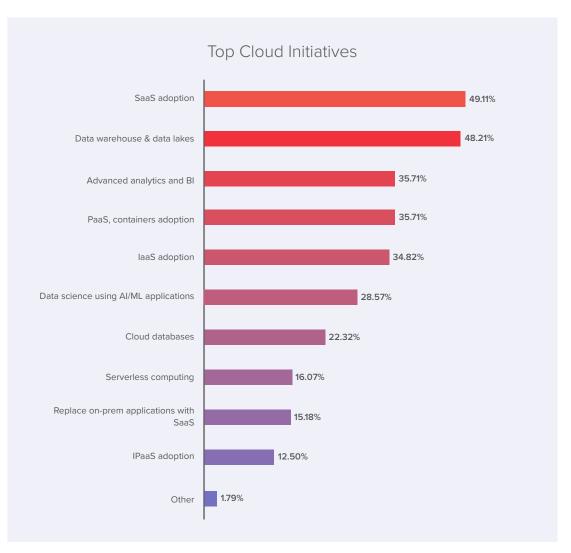
# **Top Cloud Initiatives**

Organizations are adopting cloud technologies to meet a wide variety of use cases. But what are the top initiatives that organizations are putting into action with cloud technologies in 2022?

Rising to the top are two initiatives: Software as a Service (SaaS) Adoption (chosen by 49.1% of respondents) and Data Warehouse and Data Lakes (48.2% of respondents).

Though the hybrid model has been prevalent, three years in a row, the strong interest in SaaS indicates that many companies might be moving key functionality from large, on-premises applications to "lighter" SaaS versions that offer more flexibility. In this survey, respondents will have made two references to cloud-based data warehouses and data lakes (the second is in "Rare Data Approaches as Cloud Services – In Use," below) indicating that they are experiencing a common dilemma: "Where are we going to put all of this new data we seem to be acquiring?"





Adoption, Drivers, Challenges

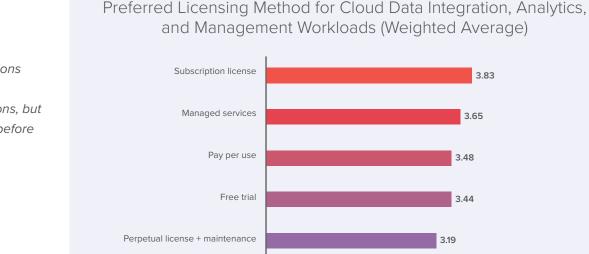
Top Initiatives Usage for Data Integration, Management, Analytics

3.09

Challenges of Being Data-Driven

#### **Preferred Licensing Method**

Cloud technologies offer a range of licensing options, and in our study, respondents showed an interest across the range. However, they did show a preference for Subscription with over 90% feeling that offering a subscription offering was important, somewhat important, very important or critical. Suggesting that for critical implementations, organizations are less interested in quick, superficial functionality and more interested in tools with diverse features that will handle a range of functions over the long haul.



Organizations prefer subscriptions, but like to try before they buy

#### **Cloud Vendor Programs Usage**

Freemium (limited free version)

Organizations adopt cloud technologies for a variety of well-known reasons, such as seamless scalability, the lack of maintenance costs, and flexibility in pricing. One of the effects of the pandemic have seen infrastructure hardware shortages and the threat of price instability spurring many large enterprises to invest in large scale, multi-year cloud contracts to lock in upfront discounts. All the major cloud providers have seen a significant increase in order backlogs as a result, which now total several hundred billion dollars worldwide. This in turn is driving the importance of cloud marketplaces as a sales channel for third-party software and security, as businesses seek to burn down these cloud commitments.

We can see this when it comes to the different incentive programs offered by the main cloud vendors, which ones are being leveraged by organizations in 2022?

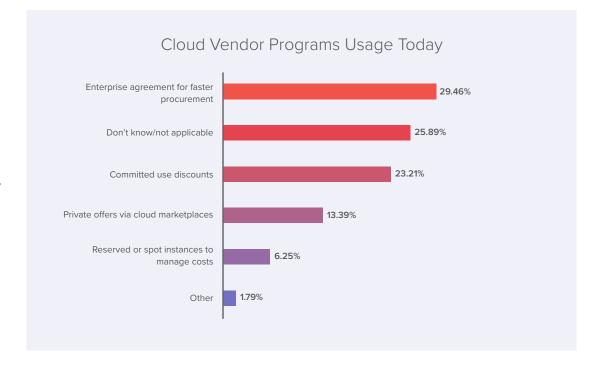
Adoption, Drivers, Challenges

Top Initiatives Usage for Data Integration, Management, Analytics

Challenges of Being Data-Driven

Enterprise Agreements, promising faster procurement, is by far the most popular program leveraged by our respondents (29.5%), and this is not surprising, given the ease with which such agreements are implemented. Interestingly, the next-most-popular response was "I Don't Know" (25.9%), suggesting that many incentive programs are not being advertised successfully. The next-most-popular response, Committed Use Discounts (23.2%), confirms the pattern: Users will avail themselves of incentive programs if they are easy and straightforward to leverage.

Enterprise
agreements and
committed use
discounts are the
most popular way
to adopt cloud in
organizations





Top Initiatives Usage for Data Integration, Management, Analytics





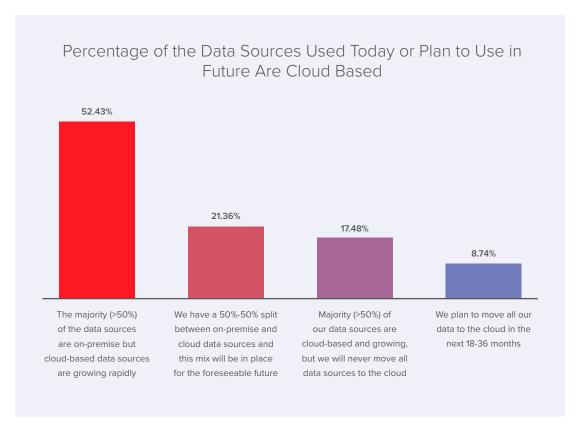
# Cloud Usage for Data Integration, Management, and Analytics

In this fourth section of questions, we zero in on how organizations are actually using the cloud, with a focus on data integration, data management, and analytics.

#### The Cloud/On-Premises Mix

As we saw above in the Characteristics of Respondent Companies section, the chosen deployment model, for the last 3 years of conducting this survey, has been the hybrid model, with some data in the cloud, and some on-premises.

The majority of companies recognize the cloud data sources are becoming increasingly important; however, it is noted that a significant number of enterprises (38.84%) surveyed have explicitly stated that there will be a mix of on premise and cloud data sources for the foreseeable future, with only 8.74% suggesting the in the near term all of their data will be migrated to the cloud.



Organizations are increasingly seeing data split between various clouds and on premise



Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

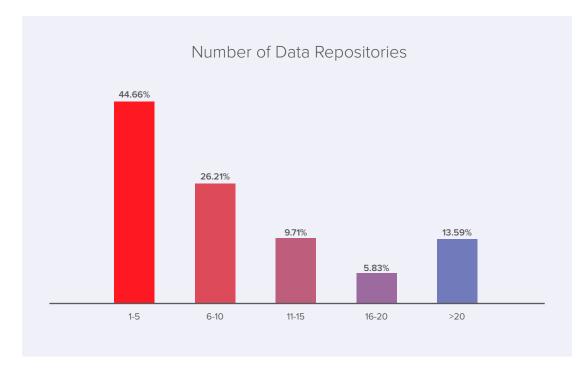
#### The Number of Data Warehouses and Other Repositories

Companies tend to deploy multiple large repositories such as data warehouses, data marts, operational data stores, data lakes, and data lake houses.

The number of repositories is being driven by the acceptance that not all repositories are equal, and each has its own specific use case. This is very much being driven by cloud adoption.

Most companies (44.7%) operate modest infrastructures with between 1 and 5 of such repositories. After that, defining the sweet spot for companies that manage large numbers of repositories, 26.2% manage between 6 and 10. Interestingly, the next-popular option is to manage more than 20 repositories (13.6%), with those that manage between 11 and 20 trailing after that.

This suggests that although a large number of organizations might be content with a small number of repositories, an equal number are embracing highly diverse infrastructures comprised of a very large number of repositories.



55.34% of those surveyed have greater than 5 operations data repositories



Top Initiatives Usage for Data
Integration, Management,
Analytics



#### Where Are Organizations' Repositories Deployed?

Corroborating the data we gained from the question about the cloud/on-premises mix, we found that 59.2% of our respondents maintain some kind of blend between cloud and on-premises systems; 32% keep most of their data in private data centers and less in the cloud, while 27.2% maintain an even 50-50 split between repositories stored on-premises and cloud repositories.

An overwhelming majority of our respondents (86.4%) are engaging, or planning to engage, with cloud systems, while only 13.6% are dedicated to keeping all of their data in a private data center.



We see 86.4% of organizations having some or all of their data repositories in the cloud

#### How Much Data Cannot Be Found, Accessed, and Analyzed?

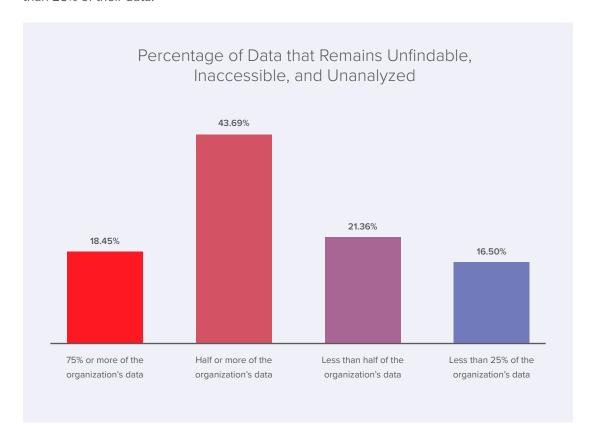
Data scientists are known to sometimes spend more time finding, accessing, and preparing data than they do analyzing it. And the adoption of cloud can result in a greater percentage of data that is inaccessible for analysis.



Top Initiatives Usage for Data
Integration, Management,
Analytics



In our study, 43.7% of our respondents were unable to find, access, and analyze half or more of their data after adopting cloud technologies, and only 16.5% were unable to leverage less than 25% of their data.



62.14% of organizations report more than half of their data is unusable



Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

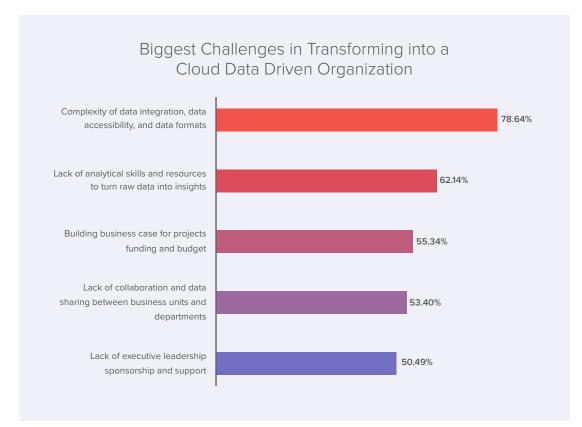


## Challenges to Becoming Data-Driven

Organizations are beginning to realize that "becoming data-driven" is not easy or straightforward, and that no app can take care of it with a few taps. Organizations that are embracing the cloud are already driven by data considerations, but organizations struggle to unite business and technology stakeholders into a common appreciation for data as not only a core asset, but also a fundamental part of their DNA. What are the organizations in our 2022 study saying about the challenges to become data-driven?

By a large margin, our respondents are citing the Complexity of Data Integration, Data Accessibility, and Accommodating Different Data Formats (cited by 78.6% of respondents), with the Lack of Analytical Skills and Resources to Turn Raw Data into Insights (62.1% of respondents) another oft-cited challenge.

Clearly, becoming data-driven requires the ability to integrate and access data, regardless of its format, as well as the ability to use data to meet goals and move the needle. Fortunately, modern data management solutions can help organizations to easily surmount these challenges.



Complexity of data integration and lack of analytical skills are hurting organizations

Adoption, Drivers, Challenges

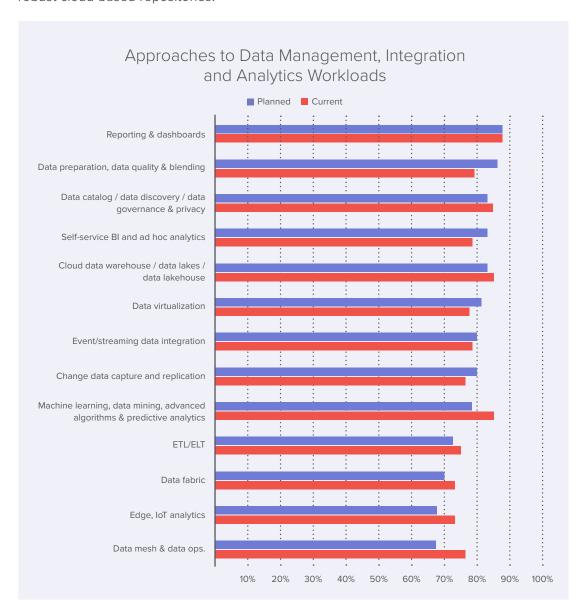
Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

#### Rate Data Approaches as Cloud Services

Organizations and individual stakeholders are drawn to the cloud as a way to serve a wide variety of use cases. Here, we examine which rare use cases, such as data mesh, edge, and machine learning, are deemed Critical or Very Important, and are currently in use.

The top-two use cases in use are Reporting and Dashboards and Cloud data warehouses currently, however we can see a shift in the future to data virtualization, data preparation, data quality and blending.

These two use cases paint a vivid portrait of the situation that many organizations are in with respect to their cloud journeys. The first reflects the fact that the business stakeholders within organizations are ready to get better use out of their data, while the second reflects that organizations are now looking to maximize their cloud systems with robust cloud-based repositories.



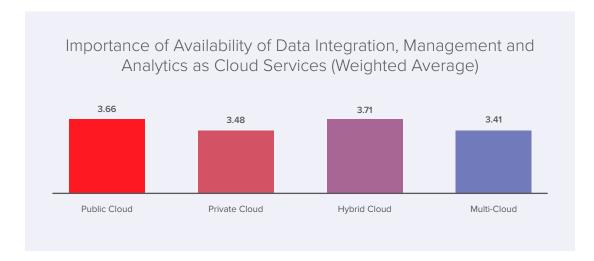
Reporting and
Dashboards
remain top use
case now and in
the future, but a
shift towards Data
Virtualization and
Data Preparation,
Data Quality and
Blending are on
the cards

Adoption, Drivers, Challenges

Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

# Importance of Availability in Cloud Data Integration, Management, and Analytics

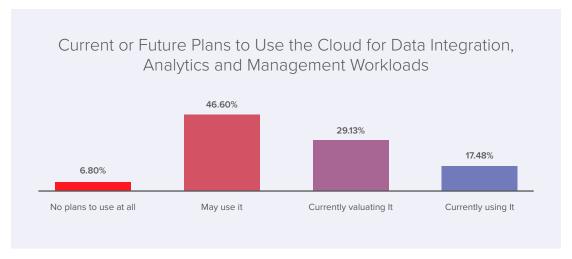
We live in a real-time world. So, it should come as no surprise to learn that availability, with regard to data integration, management, and analytics in the cloud, is not only "nice to have," but critical, or very important. This is true across all configurations, and indeed it seems like a universal truth: data stakeholders need it now; failing that, the sooner the better.



# Plans to Use the Cloud for Data Integration, Management, and Analytics

Recall that in the question above, "How Much Data Cannot Be Found, Accessed, and Analyzed?", most organizations were unable to find, access, and analyze half or more of their data after adopting cloud technologies. So, unsurprisingly, the overwhelming majority of organizations (93%) stated that they were using, evaluating, or considering leveraging cloud-based data integration, management, and analytics.

Several powerful technologies, such as data virtualization and logical data fabric, provide seamless, real-time access across both on-premises and cloud systems.



Adoption, Drivers, Challenges

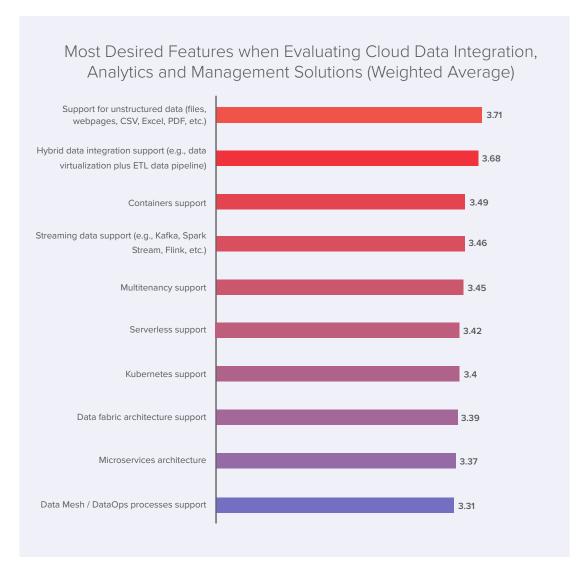
Top Initiatives Usage for Data Integration, Management, Analytics Challenges of Being Data-Driven

# Most Desired Features of a Cloud Data Integration, Analytics, and Management Solution

From the question above, we saw that organizations that are embracing the cloud are reaching a point at which they are extremely interested in leveraging cloud-based data integration, management, and analytics solutions.

But what do they want to see in such solutions? Which features are the most in-demand? We asked our respondents to choose among a wide variety of modern features, such as support for data mesh, data fabric architecture, and hybrid data integration support.

The top-two desired features were Support for Unstructured Data (which was deemed Critical or Very Important to 60.2% of respondents) and Support for Hybrid Data Integration (deemed Critical or Very Important to 57.3%), with 93% or respondents agreeing that a Microservices Architecture is important, and similarly 93% felt streaming data support was important, somewhat important, very important or critical. Other highly desired features were support for containers, serverless deployment, Kubernetes, and data fabric architecture

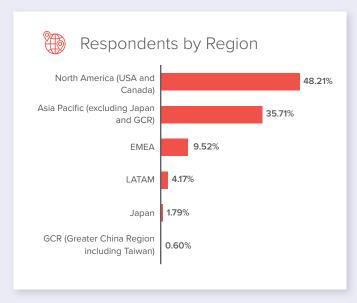


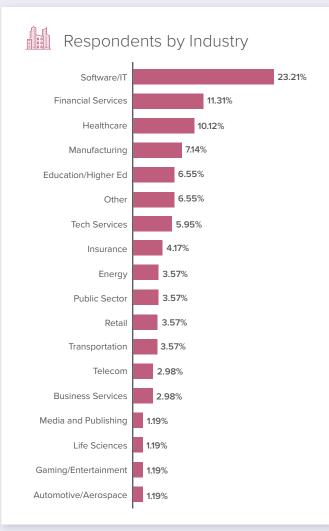
Support for unstructured data and hybrid data integration are key to success for those surveyed

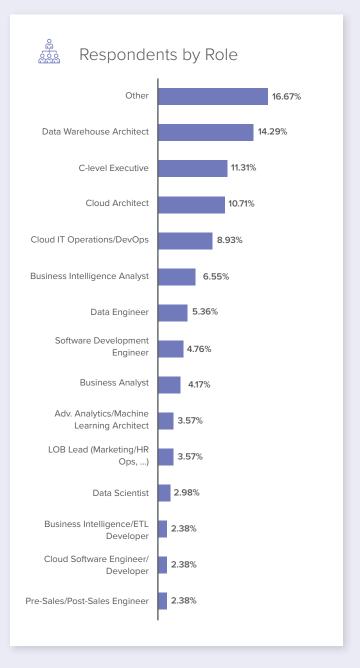
## Methodology

The Denodo Global Cloud Survey 2022 surveyed stakeholders at over 150 organizations across 3 major global regions - North America, EMEA, and APAC. Data and cloud professionals from various backgrounds and roles participated and shared their insights. The results from the Denodo Global Cloud Survey 2022 highlights where organizations are in their cloud adoption journeys. Surveys were fielded online in March 2022.

#### **DEMOGRAPHICS**







### The Denodo Platform at-a-Glance

The Denodo Platform is the industry's only data integration and management platform, powered by data virtualization, that offers all the capabilities necessary to build a data fabric, data mesh or a data hub. It provides a common semantics layer to expose data more quickly to business, a dynamic data catalog for semantic search and enterprise-wide data governance, industry leading query acceleration supported by machine learning, automated infrastructure management for multi-cloud and hybrid-cloud scenarios, and embedded data preparation capabilities for self-service analytics, faster time-to-insight, better privacy and compliance, greater automation of data management processes, and avoiding vendor lock-in.

#### **Denodo Platform Benefits**

**Up to 65%** 

faster than ETL

**Up to 67%** 

less data preparation time

<6 months

breakeven time

#### **Denodo Platform Subscriptions**

The Denodo Platform is available through four different subscription levels, ideal for all your data integration and data management needs.



#### **DENODO ENTERPRISE PLUS**

Further automation, collaboration and advanced security for enterprise-wide deployments



#### **DENODO ENTERPRISE**

Enterprise-wide deployment for multiple use cases and groups, with large data volumes



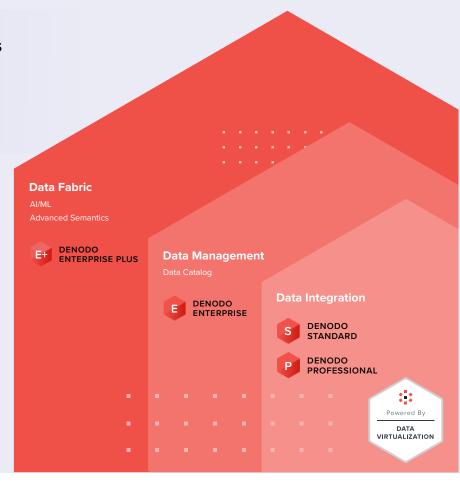
#### **DENODO STANDARD**

Multiple use cases at departmental level

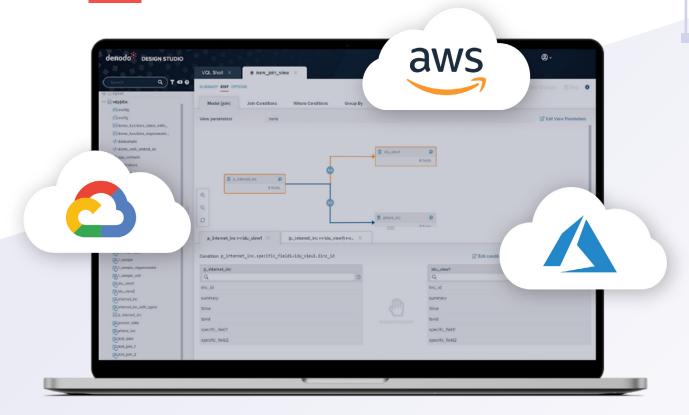


**DENODO PROFESSIONAL** 

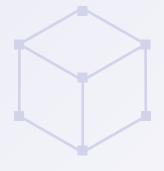
Small departmental project



Denodo Professional offers a 30-day free trial across AWS, Microsoft Azure, and Google Cloud Platform marketplaces



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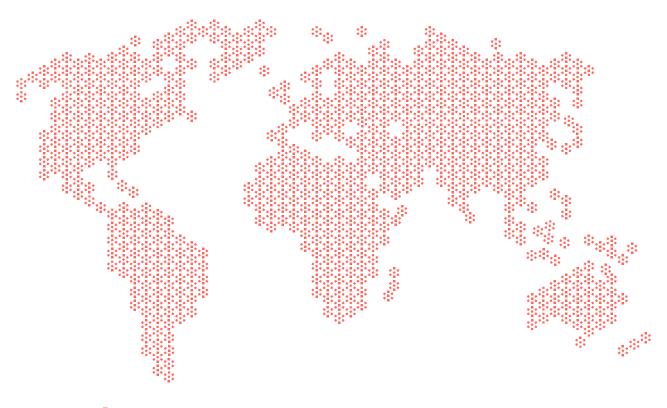
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### Tech Mahindra

Tech Mahindra offers innovative and customer-centric digital experiences, enabling enterprises, associates, and the society to Rise. We are a USD 6 billion organization with 151,100+ professionals across 90 countries helping 1224 global customers, including Fortune 500 companies. We are focused on leveraging next-generation technologies including 5G, Blockchain, Quantum Computing, Cybersecurity, Artificial Intelligence, and to enable end-to-end digital transformation for global customers. We are the fastest growing brand in 'brand strength' and amongst the top 7 IT brands globally. With the NXT.NOWTM framework, Tech Mahindra aims to enhance 'Human Centric Experience' for our ecosystem and drive collaborative disruption with synergies arising from a robust portfolio of companies.



Wipro Limited (NYSE: WIT, BSE: 507685, NSE: WIPRO) is a leading global information technology, consulting and business process services company. We harness the power of cognitive computing, hyper-automation, robotics, cloud, analytics and emerging technologies to help our clients adapt to the digital world and make them successful. A company recognized globally for its comprehensive portfolio of services, strong commitment to sustainability and good corporate citizenship, we have over 240,000 dedicated employees serving clients across six continents. Together, we discover ideas and connect the dots to build a better and a bold new future.



denodo

Denodo is a leader in data management. The award-winning Denodo Platform is the leading data integration, management, and delivery platform using a logical approach to enable self-service BI, advanced analytics, hybrid/ multi-cloud integration, and enterprise data services. Realizing more than 400% ROI and millions of dollars in benefits, Denodo's customers across large enterprises and mid-market companies in 30+ industries have received payback in less than 6 months.

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