



VENTANA RESEARCH



Data and Analytics in the Cloud

Enabling Access and Integration
through Cloud Computing

White Paper



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June 2015



Ventana Research performed this research to determine attitudes toward and utilization of data and analytics in cloud-based systems. This document is based on our research and analysis of information provided by organizations that we deemed qualified to participate in this benchmark research.

This research was designed to investigate practices, needs and potential benefits of data and analytics in the cloud. It is not intended for use outside of this context and does not imply that organizations are guaranteed success by relying on these results to improve data and analytics in the cloud. Moreover, gaining the most benefit from data and analytics in the cloud requires an assessment of your organization's unique needs to identify gaps and priorities for improvement.

The full report with detailed analysis is available for purchase. We can provide detailed insights on this benchmark research and advice on its relevance through the Ventana On-Demand research and advisory service. Assessment Services based on this benchmark research also are available.

We certify that Ventana Research wrote and edited this report independently, that the analysis contained herein is a faithful representation of our evaluation based on our experience with and knowledge of data management, analytics and cloud computing, and that the analysis and conclusions are entirely our own.

Ventana Research
2603 Camino Ramon, Suite 200
San Ramon, CA 94583-9137
info@ventanaresearch.com
(925) 242-2579
www.ventanaresearch.com

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Executive Summary

Cloud computing provides an increasingly popular alternative to installing and maintaining systems on computers and networks on an organization's own premises. Cloud-based applications are managed primarily by the supplier; they often do not require in-house technological expertise for implementation and can be funded from an operational budget rather than as a capital expense. In addition, using analytics systems that reside in the cloud can help address an organization's need for access to data sources beyond the company firewall to incorporate into its business processes and decision-making.

This research finds that virtually all participating organizations currently use or intend to use cloud-based analytics.



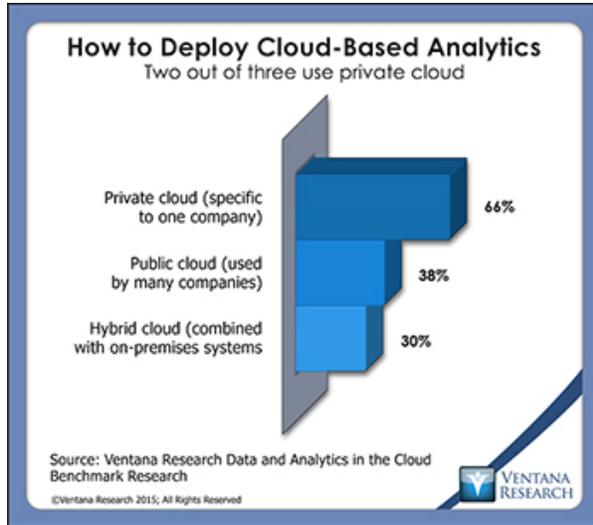
information technology they use. We also evaluated cloud-based analytics in the context of trends in big data, mobile technology and social collaboration.

Ventana Research undertook this benchmark research to determine the attitudes, requirements and future plans of organizations that use data and analytics in the cloud and to identify the best practices of those that are most proficient in it. We set out to examine both the commonalities and the qualities specific to major industry sectors and across sizes of organizations. We considered how organizations perform analytics, to what types and sources of data they apply it, issues they encounter in the process and the

The research finds that virtually all participating organizations currently use or intend to use cloud-based analytics. Nearly half (48%) already use it, another 19 percent said they plan to begin using it within 12 months, and 31 percent said they will begin to use it but do not know when. In addition to using it in business intelligence tasks, more than 30 percent of organizations use cloud-based analytics in marketing, customer service, human capital management, sales and accounting. In terms of business roles, front-office functions such as marketing and sales said it is important more often than did finance, accounting and human resources.



There are three basic options for cloud deployment: a private cloud for a single company; a public cloud shared by any number of companies;



and a hybrid cloud configuration that combines cloud-based and on-premises systems. It is possible to use more than one approach, and many organizations do. The research finds that two out of three organizations today use a private cloud, almost as many as use the other two approaches combined.

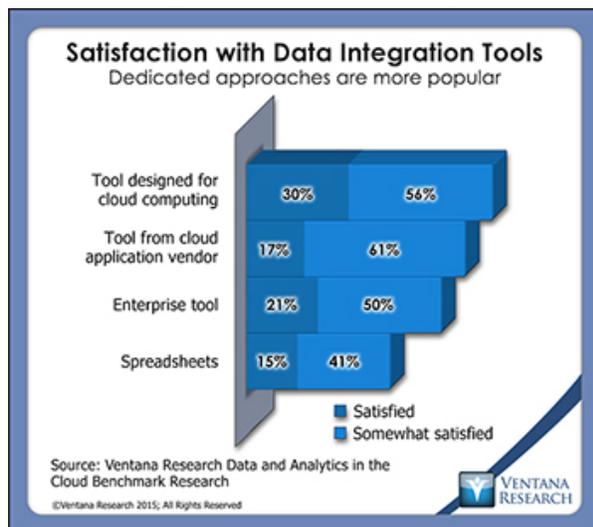
We believe that a major contributing factor to the popularity of private clouds is that public clouds are perceived as less secure. The

research confirms that concerns about security are the biggest barrier to cloud use for more than half (56%) of the organizations that don't yet use it for analytics. Further analysis indicates that hybrid cloud environments are more prevalent in the regulated industry sectors of finance, insurance and real estate (38%) and government (45%) than in services (28%) and manufacturing (22%). Thus, the research finds that private cloud and hybrid cloud deployments are used more often for analytics in situations where data privacy is a larger concern.

Regardless of which cloud configuration is chosen, the data stored there is important to businesses. Three-fourths of companies participating in this research said that it is important or very important to access data from cloud-based sources. We also find that they need to access many sources for their cloud-based analytics. At least half of organizations draw data from business applications, business intelligence applications, and data warehouses or operational data stores, and 41 percent use relational databases. Overall, more than two-thirds of organizations need to integrate five or more data sources for cloud-based analytics, and not all of them are behind the company firewall. Important external data sources include business applications (for 61%), social media data (48%), Internet information sources (42%), government sources (33%) and market data sources (29%).



Wherever the sets of data reside, each must be normalized and they must be combined into a single data set before analytics can be performed. This is a challenge for many users; the research shows that the analytics-related tasks in which organizations spend the most time are preparing data for analysis (55%) and reviewing data for quality and consistency issues (48%). Those who take seriously the need for integration and preparation of data feel better about the results. Among participants who said it is very important to integrate data for cloud-based analytics, more than a third (35%) also said they are very confident in their ability to use the cloud for analytics; no more than one in 10 of those who didn't ascribe as much importance to those processes, saying rather that integrating data is important or somewhat important, declared they are that confident. Those who said integration is very important also said most often that cloud-based



analytics helps them improve presentation of data and analytics, gain access to many different data sources and improve data quality and data management.

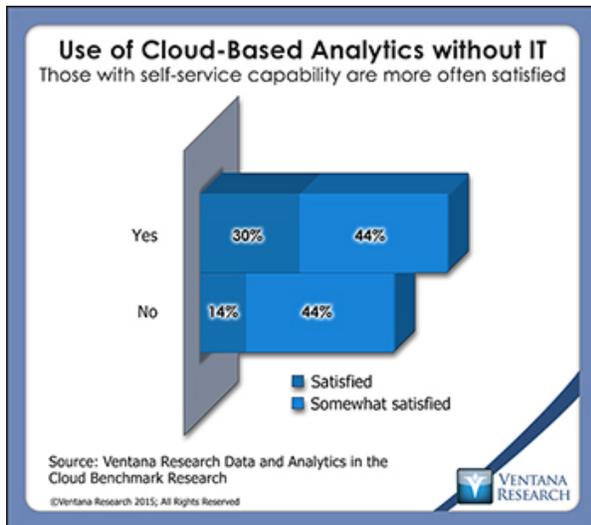
The research also investigated the tools organizations use to integrate cloud-based data with data from other sources. The largest percentages make do with tools already at hand – spreadsheets (49%) and enterprise integration tools (43%). Fewer use tools provided by a cloud application

vendor (38%) or data integration tools designed for cloud computing (33%), but analysis shows these users are more content with them: 78 percent of the former and 86 percent of the latter said they are satisfied or somewhat satisfied with their tools. Only 15 percent of spreadsheet users are satisfied, and almost three in five (58%) of those using spreadsheets said it hampers their ability to manage processes efficiently.

Using cloud computing correlates to how businesses manage and use information. The research finds that when business intelligence and analytic data sets were stored only on-premises and were largely the domain of IT professionals, business units relied on those specialists to provide analysis and answers to their questions. Today, though, with



many research participants saying they are able to access cloud-based systems to work with and analyze data without involvement from IT,



substantially higher percentages of those not relying on IT expressed confidence in the organization's ability to use cloud computing for analytics (77% vs. 44%) and satisfaction with their cloud-based analytics (74% vs. 58%).

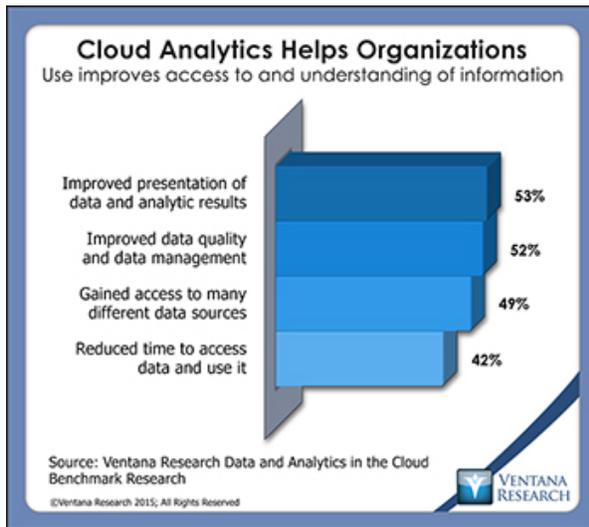
Of course, even when cloud-based systems are in use IT still has an initial role in preparing most data for use; our research indicates that analytics most often requires integration of cloud-based systems when used for query and reporting (in

59% of organizations), data discovery (58%) and forecasting and planning (56%). And a majority (53%) of organizations said they need IT assistance to access cloud-based systems so they can work with and analyze data.

To be able to do use analytics on data themselves, business people require software that is less complicated to manipulate than the BI tools of the past yet provides a range of advanced capabilities. The research confirms that among the evaluation criteria applied by companies exploring purchase, usability is the one most often cited as very important, chosen by nearly two-thirds (63%) of organizations. This fits with the trend we see in the development of these products: Vendors of cloud systems, using the capabilities of their products to onboard and enable use independent of in-house IT as a selling point, often focus on making the user experience intuitive. When such modern tools are available, they make it possible for users to get answers to business questions faster and more easily, enabling them to anticipate changes and assist executives in making timely decisions. Along these lines, the research shows that the most highly rated organizational benefits of cloud-based analytics are better communication and knowledge sharing, ranked first or second by 39 percent of organizations, and improved efficiency in business processes (35%).



While cloud computing and analytics are key new technologies, they aren't the only ones to have powerful impacts. Our research on business technology innovation finds that while organizations do most often consider analytics important to improve their performance, two other technologies, collaboration and mobility, ranked second and third. In our current research 38 percent of participants said they use collaboration technology with data and analytics, and only 11 percent said they don't intend to use it. For organizations using social



collaboration technologies, discussion forums, broadcasting (as in Twitter) and wall posting (a la Facebook) are the top three approaches in use today and planned for use. Such tools facilitate communication and knowledge sharing, which as noted above is the top-ranked business benefit of cloud-based analytics.

Cloud-based analytics also can add value by providing data and analytic results directly to end users. More than half (53%) of organizations said that cloud-based analytics has helped

their customers, partners and employees by improving the quality of the presentation of data and analytics results to end users. This increasingly is being done using mobile technology, and more than half of participating organizations (57%) also said it is important or very important to provide access to data and analytics through mobile devices. The value of such mobile access is underscored by the finding that the categories of information for which cloud-based analytics is most often deemed important are forecasting (mentioned by 51%) and customer-related (47%) and sales-related (33%) information. For these categories of information, the consumers often are mobile workers. And nearly all participants (97%) said mobile technology has improved their access to and use of cloud-based data.

Another important innovative technology, and one closely linked to analytics, is big data. Analytics can provide organizations with insights drawn from the masses of data they accumulate and process in big data systems. In this research three out of five participants use cloud computing for managing big data or plan to use it in the next 12 to 18



months. Further analysis shows that organizations having the most experience with storing their data in the cloud are the ones most often satisfied with cloud-based analytics. We also find movement toward advanced systems for managing big data: Half now use data warehouse appliances, and 28 percent more intend to use them; 41 percent use in-memory databases and 34 percent more plan to. Such advanced technologies can help in the integration of various types of data and its preparation for analysis.

As business applications continue to be deployed in the cloud, more data and analytics are moved there as well. However, analytics in the cloud, especially for front-office functions such as marketing, is fragmented in terms of both applications and data. For companies that do not take the next step of integrating the arrays of cloud-based data with data stored on-premises, this fragmentation can degrade users' satisfaction with cloud-based analytics.

To integrate the data, most organizations use spreadsheets and legacy integration tools, but the research shows that use of these tools is associated with less satisfaction with and less confidence in the analytics. However, alternatives in the form of cloud-based data integration technology have become available.

For managing data and analytics in the cloud, choices are available that can address an organization's specific needs. Particularly when their use is integrated with other advanced technologies such as mobility, collaboration and big data, organizations can derive greater value from their data and technology investments. Used wisely, cloud-based data and analytics can help users improve efficiency and effectiveness and ultimately improve outcomes.



Key Insights

This benchmark research yielded the following important general findings and key insights regarding data and analytics in the cloud. (We discuss performance levels in the Performance Index portion of the full research report; the actual questions asked in our survey are in an appendix to the research report. Specifics of organization sizes are in the appendix “About This Benchmark Research.”)

Organizations have room for improvement in cloud-based analytics.

Our Performance Index analysis of this research places nearly three-fourths (73%) of participating organizations at the two middle levels,

For cloud-based data and analytics, technology and analytic processes have advanced more rapidly than organizations’ abilities to secure their information and provide the skills that people need.

Advanced and Strategic, of our four-stage performance hierarchy. Fewer than one in seven rank at the lowest Tactical level and a similar percentage at the highest Innovative level. This indicates that most organizations have made some progress in managing data and analytics in the cloud but that more work will be required to do so optimally. Analysis in terms of the four dimensions by which we segment performance reveals more detailed differences. Half reach the top two levels in the Process (51%) and Technology (50%) dimensions; slightly fewer (44%) rank in the top two levels for the People and Information dimensions. Our Performance Index analysis commonly finds better performance in Technology and

Information than in People and Process, but in this instance analytic processes have advanced more rapidly than organizations’ abilities to secure and work with their information. The lower performance in People and Information aligns with the top barriers to deployment for cloud-based analytics identified in this research: lack of confidence about the security of data and analytics, mentioned by 56 percent of organizations, and not enough skills to use cloud-based analytics (42%).



Our analysis reveals differences in performance by company size. Three in five large and very large companies as measured by annual revenue reach the top two performance levels; these companies typically have more resources to expend than smaller ones. Only about two in five midsize and small companies rank in the top half. This correlates to a focus on cloud-based analytics by large and very large companies, 72 percent of which said such a focus is important or very important; only 60 percent of small and midsize ones said that. We conclude that while small and midsize companies may make significant use of cloud-based applications, they have placed less emphasis on cloud-based data and analytics.

Adoption of cloud-based analytics is growing rapidly, especially in the front office.

This research finds that virtually all participating organizations currently use or intend to use cloud-based analytics. Nearly half (48%) already use it, another 19 percent said they plan to begin using it within 12 months, and 31 percent said they will begin to use it but do not know when. A larger percentage of executives (63%) said the

While many departments said they use cloud-based analytics, front-office functions such as marketing and sales rated it important more often than did finance, accounting and human resources.

organization has adopted it than did users in the lines of business (41%), who would be more likely to actually use the analytics. Predictably, analytics and/or business intelligence use (54%) is the area of the organization in which cloud-based analytics is most often important, but it also is important for marketing (34%), sales (31%), customer service (30%), accounting (23%) and finance (23%). In terms of actual use, analytics or business intelligence (64%) ranks first and marketing (37%) second as well; customer service, human capital management, sales and accounting each tally more than 30 percent. We note that while many departments said they use cloud-based analytics, front-office functions such as marketing and sales rated it important

more often than did finance, accounting and human resources. Thus, while organizations have implemented a broad range of cloud-based analytics for various functions, analytics to support front-office functions such as marketing and sales are most important today.



Various cloud computing approaches are used for analytics.

Among the three options for cloud deployment, the research finds that the largest percentage of organizations (66%) use a private cloud to deploy analytics; fewer use a public cloud (38%) or a hybrid cloud (30%). (Many organizations use more than one method.) More participants expressed some degree of satisfaction with hybrid cloud implementations (93%) than with private cloud (86%) and public cloud (82%) approaches.

The research data makes clear that organizations implementing analytics using a private or hybrid cloud feel more comfortable than public cloud users in many areas.

Of the three, organizations are least often satisfied with public clouds when asked about the ways in which cloud-based analytics has helped customers, partners and employees. They favor a public cloud much less than others for providing access to data for analytics (29% for public cloud vs. 58% for private cloud and 67% for hybrid cloud). The gap is similar for contributing to improved communication and information sharing (56% public vs. 72% private and 70% hybrid). The research data makes clear that organizations implementing analytics using a private or hybrid cloud feel more comfortable in many areas.

In using public clouds companies share the technology with other clients of the provider, and they are considered less secure than the other approaches, which we believe is a cause of their lower approval percentages – concerns about security are still the biggest barrier to cloud deployment for more than half (56%) of organizations that have yet to deploy it for analytics. Comparing deployment by industry sector, the research analysis shows that hybrid clouds are more prevalent in the regulated areas of finance, insurance and real estate (38%) and government (45%) than in services (28%) and manufacturing (22%). Thus, the research suggests that private and hybrid cloud deployments are used more often for analytics and that data privacy concerns must be addressed.



Use of multiple cloud-based analytics tools creates complexity.

While more than half (54%) of participating organizations use cloud-based analytics and business intelligence applications, the research shows that the environment is fragmented: More than three in five organizations (62%) use cloud-based analytics tools from two or more vendors, and no vendor's tools are used by more than 35 percent. In general we find silos of cloud-based analytics. For example, social

More than three in five organizations (62%) use cloud-based analytic tools from two or more vendors, and no vendor's tools are used by more than 35 percent.



media data (48%) is the second-most widely used type of data for cloud-based analytics, yet only 27 percent of participants said they need to integrate social data for their cloud analytics. Since so many don't perform this integration, we infer that social media analytics typically is done separately. Analytics embedded directly into transaction applications, which nearly three out of four (72%) said is important or very important, represents another analytic silo; cloud-based transaction systems such as human resources, marketing and sales are seldom integrated.. The research thus

paints a picture of an atomized rather than a cohesive approach to analytics, with separate systems serving different needs in the organization.

Many organizations use spreadsheets to source, consolidate and prepare data.

Almost half (49%) of organizations in the research use spreadsheets to manage the integration and preparation of cloud-based data. Yet doing so poses serious challenges: 58 percent of those using spreadsheets said it hampers their ability to manage processes efficiently. The research also finds that organizations utilizing newer integration tools are satisfied with them more often than those using older tools. More than three-fourths (78%) of those using tools provided by a cloud applications provider said they are satisfied or somewhat satisfied with them, as are even more (86%) of those using data integration tools designed for cloud computing; by comparison, fewer of those using spreadsheets (56%) or enterprise data integration tools (71%) are satisfied. This is not surprising. Modern cloud connectors are designed to connect via loosely coupled



interfaces that allow cloud systems to share data in a flexible manner. The research thus suggests that for organizations needing to integrate data from cloud-based data sources, switching to modern integration tools is a critical enabler.

While more than three in five companies (61%) still primarily do integration between on-premises systems, significant percentages are now doing integration from the cloud to on-premises (47%) and from on-premises to the cloud (39%). Most expected to be in demand over the next year and in the future are cloud to cloud and on-premises to cloud integration (both 45%). The research finds that spreadsheets (49%) and enterprise integration tools (43%) are the tools most frequently used to integrate cloud-based data sources. While these may suffice for integrating relatively small data sets in an on-premises environment, they have limitations when dealing with cloud-based data. For instance, spreadsheets have limits on data size and on-premises tools may not be designed to integrate data sources from outside the organization's firewall.

Integrating and preparing data is a critical enabler for cloud-based analytics.

Organizations now need to access and integrate sources such as semistructured documents (33%), social media (27%) and nonrelational database systems (19%).

To be able to make decisions based on a complete view of their businesses, organizations need access to and integration of multiple data sources. The research finds that the most common data sources are well established: business applications (51%), business intelligence applications (51%), data warehouses or operational data stores (50%), relational databases (41%) and flat files (33%). Now, however, organizations also are including less structured sources such as semistructured documents (33%), social media (27%) and nonrelational database systems (19%). Further analysis shows that those who said it is very

important to integrate data for cloud-based analytics (42% of participants) also said they are very confident in their ability to use the cloud for analytics (35%) three times more often than those who said integrating data is important (10%) or somewhat important (9%). Those saying that integration is very



important also said more often that cloud-based analytics helps their customers, partners and employees in an array of ways, including improved presentation of data and analytics (62% vs. 43% of those who said integration is important or somewhat important), gaining access to many different data sources (57% vs. 49%) and improved data quality and data management (59% vs. 53%).

Three-quarters of companies said that it is important or very important to access data from cloud-based sources. More than two-thirds need to integrate five or more data sources to support cloud-based analytics.

Important external data sources include business applications (for 61%), social media data (48%), Internet information sources (42%), government sources (33%) and market data sources (29%), and whether in the cloud or not, each must be normalized and combined with internal sources into a single data set so that analytics can be performed. Each data source can represent a different and perhaps complex data model. Furthermore, the data sets could have varying data formats and interface requirements, a problem not easily addressed with legacy integration tools. Preparing data for analysis is the task in which organizations (55%) spend the most time, followed by reviewing

Preparing data for analysis is the task in which organizations (55%) spend the most time, followed by reviewing data for quality and consistency issues (48%).



data for quality and consistency issues (48%). Integration and preparation of data is not easy, but it is a critical enabler for use of cloud-based analytics.

Cloud-based analytics can empower business users and save money.

Among software evaluation criteria, usability is the one most often called very important; it was chosen by close to two-thirds (63%) of all participants in this research. Usability is essential if business people are to work on analytics tasks themselves without having to rely on IT help. Research participants who said they are able to access cloud-based systems to work with and analyze data without involvement from IT are a minority (40% vs. 53% needing IT). However, a substantially higher percentage of those not relying on IT expressed confidence in the organization's ability to use cloud computing for



analytics (77% vs. 44%) and satisfaction with their cloud-based analytics (74% vs. 58%). The research overall finds that the departments and categories of information most important for business are in the front office – marketing, sales, customer service and commerce – rather than in the back office and administrative.

IT involvement has been necessary initially to access, prepare, design and govern data for use. Our research indicates that analytics most often requires integration of cloud-based systems when used for query and reporting (59%), data discovery (58%) and forecasting and planning (56%). Once that is done, though, using cloud-integrated data for analytics can enable internal self-service on an ongoing basis, empowering business users, improving communication and process efficiency.

Mobile technology is essential for cloud-based analytics.

Business users need information delivered in formats they can work with. In this research more than half (53%) of organizations said that cloud-based analytics has helped their customers, partners and

More than half (57%) of organizations said it is important or very important to provide access to data and analytics through mobile devices.

employees by improving presentation of data and analytics results to end users. In business today, users increasingly want to be able to access data on mobile devices. In this case, more than half (57%) of organizations said it is important or very important to provide access to data and analytics through mobile devices. This is underscored by the finding that the categories of information for which cloud-based analytics is most often deemed important are forecasting (mentioned by 51%) and customer-related (47%) and sales-related (33%) information. For these categories of information, the consumers are often mobile workers.

Among participating organizations, 83 percent said they need to support data access and analytics on mobile devices. Doing so can be complicated, though, as two-thirds said they support both tablets and smartphones and multiple mobile operating systems, the most important of which are Apple iOS (ranked first by 60%), Google Android (ranked first by 26%) and Microsoft Windows Mobile (ranked



first by 13%). Dealing with such complexity, however, can pay off. Nearly all participants (97%) said mobile technology has improved to at least some extent their access to and use of cloud-based data. Mobile access to analytics and data is increasingly important to organizations of all sizes and in all industries.

Collaboration enables dissemination of analytics in the cloud.

One way to improve communication and knowledge sharing, the top-ranked benefit of using data and analytics in the cloud, is with business and social collaboration. Currently, nine out of 10 organizations in this research said they use or intend to use such technology to support their cloud-based data and analytics efforts, but

For organizations using social collaboration technologies, discussion forums, broadcasting and wall posting are the top three approaches in use today and planned to use.

only one out of five have used it for more than a year. This can help explain why conventional methods such as file sharing and email are still the most common ways of sharing information. Newer methods of sharing such as blogs, instant messaging and social collaboration currently are much less often important. At the same time, fewer than one-third (30%) of participants said they are satisfied with their approaches. For organizations using social collaboration technologies, discussion forums, broadcasting and wall posting are the top three approaches in use today and planned to use. Recognition for contributions and earning badges and awards currently are

used by fewer than one in five, but are the tools most often being evaluated, by 36 percent and 28 percent, respectively. We expect that deployment of collaborative platforms and embedding of the tools in applications will increase the use of cloud-based analytics.

Movement of big data to the cloud is growing steadily.

Satisfaction with and confidence in cloud analytics are directly related to how much of an organization's data is in the cloud, the research finds. Those that have long stored the majority of it in the cloud most often said they are very confident in (50%) and satisfied with (48%) cloud-based analytics. For those transitioning to storing the majority of data in the cloud, those farther along in the process are more often



confident and satisfied than those with less data there. This pattern of descending satisfaction and confidence reflects the fact that when data is placed in the cloud on an aggregate basis, a unified analytic data set is created and analytics is then much easier to use. Among organizations shifting to big data management in the cloud, fewer than one-third (31%) are satisfied today. We find that two-thirds of organizations need to move cloud-based data into big data stores rapidly, whether in real time (21%), hourly (12%) or daily (34%).

About one in three (32%) use cloud computing for managing big data, and nearly as many (28%) plan to in the next 12 to 18 months. When storing big data in the cloud, more than three in five (62%) organizations still use relational database systems, but half now use data warehouse appliances, and 28 percent more intend to use them. Additionally 41 percent use in-memory databases and 34 percent more plan to. While Hadoop and NoSQL technologies lag in adoption now, used by about one in four organizations, 41 percent intend to use Hadoop, and 34 percent will use other NoSQL approaches. As organizations accumulate more data in the cloud as well as from their on-premises applications, access to and use of big data with cloud-based applications is increasingly important.



10 Best Practice Recommendations

This benchmark research reveals significant new insights into the evolving nature and use of data and analytics in the cloud. For organizations considering such deployments, we offer the following recommendations.

1. Analyze your organization's performance in four key dimensions.

Our Performance Index analysis indicates that most organizations have made some progress in managing data and analytics in the cloud but they'll need to do more to perform optimally. Among the four dimensions by which we segment performance, half reach the top two levels in the Process and Technology dimensions, but slightly fewer (44%) rank in the top two levels for the People and Information dimensions. That is, in this case technology and analytic processes have advanced more rapidly than organizations' abilities to secure their information and provide the skills that people need to take full advantage of those advances. Evaluate your capabilities in each of these dimensions, and determine where you require improvement to take full advantage of cloud-based data and analytics.

2. Assess which areas of the organization can best use cloud-based data and analytics.

Nearly all participating organizations currently use or intend to use cloud-based analytics, so don't overlook this increasingly popular option. An early step in the analysis should be to identify the functions that need it most. In the research analytics and/or business intelligence (cited by 54%) is the area most often moved to the cloud, but it also is important for marketing (34%), sales (31%), customer service (30%), accounting (23%) and finance (23%). We advise giving the first three of these last five special consideration as cloud-based analytics is rated especially highly by professionals in these front-office roles.



3. Weigh the options for cloud-based deployments of analytics.

Among the three options for cloud deployment, the research finds that the largest percentage of organizations (66%) use a private cloud (exclusive to them) to deploy analytics; fewer use a public cloud (shared with others, 38%) or a hybrid cloud (combined with on-premises systems, 30%). These need not be exclusive choices, as the percentages show many organizations using more than one method. Participants favor public clouds much less for various tasks associated with providing access to data for analytics; we believe this and similar opinions are related to the perception that public clouds are less secure than the other options. In general the research suggests that private clouds and hybrid clouds are used more often for analytics that involves private data and privacy concerns; in making your decision consider the sensitivity of the data with which your organization typically deals.

4. Determine the number and variety of analytic tools used in your organization.

More than three in five organizations (62%) use cloud-based analytic tools from two or more vendors, and no vendor's tools are used by more than 35 percent of participants. Often tools differ with the type of data being analyzed. Nearly two-thirds (72%) said it is important to embed analytics directly into transaction applications. While this may work well for departmental use, it can cause problems when trying to share data across functions, particularly in integration of data types. If you seek a cohesive approach to using cloud-based analytics, look into tools that may be suitable for all functions and users.

5. Compare the performance of tools designed for the cloud with older ones already in use.

Although almost half (49%) of organizations use spreadsheets to manage the integration and preparation of cloud-based data, 58 percent of those said it hampers their ability to manage processes efficiently. In contrast, organizations utilizing newer integration tools are satisfied most often with them: 78 percent of those using tools provided by a cloud applications provider and 86 percent of those using data integration tools designed for cloud



computing. Using data and analytics in the cloud is a new approach, and it makes sense to look at new tools for it. Another factor is the finding that more organizations are now doing integration from the cloud to on-premises systems (47%) and vice versa (39%). Spreadsheets and other legacy tools may encounter problems in dealing with cloud-based data.

6. Understand the importance of integrating and preparing data for cloud-based analytics.

To be able to make decisions based on a complete view of their businesses, organizations need access to and integration of multiple data sources, not only the usual business applications but now also less structured sources such as websites and social media. The research shows that organizations committed to such integration are more confident in their ability to use the cloud for analytics than those to whom it seems less important. Remember that all these types must be normalized and combined into a single data set before analytics can be performed. Using fully capable tools to do this can cut the time it takes to prepare data, which is the most time-consuming analytic task for more than half of organizations.

7. Consider how cloud-based analytics can empower business users and save resources.

The majority of research participants said they require help from IT to access cloud-based systems to work with and analyze data, but 40 percent said they do not. Those more independent users expressed more confidence in their organization's ability to use cloud computing for analytics (77% vs. 44%) and satisfaction with their cloud-based analytics (74% vs. 58%). In most cases IT will still be needed to integrate data before analytics is used, but after that advanced tools can enable internal self-service for business users, saving time and technical resources. Evaluate such tools particularly for usability, which is the software criterion most often called very important, by 63 percent of participants.

8. Enable the use of mobile technology for cloud-based analytics.

More than half (53%) of organizations said that cloud-based analytics have helped their customers, partners and employees by



improving presentation of data and analytics results to end users. A similar percentage (57%) said it is important or very important to provide access to data and analytics through mobile devices. Employees in sales, marketing and other roles that need analytics often use these devices while on the go. Determine the types and brands of mobile systems your organization should support. Two-thirds said they support both tablets and smartphones, and the Apple and Android operating systems are widespread. Providing mobile access will be worth doing: 97 percent said mobile technology has improved their access to and use of cloud-based data.

9. Use collaboration to share analytics in the cloud.

The top-ranked benefit of using data and analytics in the cloud, as identified by one in four participants, is better communication and knowledge sharing. Collaboration can enable this. Currently only 30 percent of organizations said they are satisfied with their approaches to collaboration, and we correlate this with the finding that most use conventional methods such as file sharing and email to share information. Instead we recommend examining the business uses of social collaboration technologies such as discussion forums, broadcasting and wall posting, which most organizations intend to use if they don't already. We expect collaborative platforms and capabilities embedded in applications to increase the use of cloud-based analytics.

10. Recognize the relationship of big data and cloud-based analytics.

Managing the incessant inflow of data is a challenge for businesses of all sizes, many of whom are considering the technology known as big data. Storing it in the cloud can ease the load on in-house servers and systems. One in three organizations in this research now use cloud computing for managing big data, and nearly as many (28%) plan to in the next 12 to 18 months. We recommend adopting technologies designed to deal with this deluge, and we find that half now use data warehouse appliances and 41 percent use in-memory databases; numbers will increase steadily for both. Used properly big data facilitates analytics, and placement of both in the cloud will grow.



About Ventana Research

Ventana Research is the most authoritative and respected benchmark business technology research and advisory services firm. We provide insight and expert guidance on mainstream and disruptive technologies through a unique set of research-based offerings including benchmark research and technology evaluation assessments, education workshops and our research and advisory services, Ventana On-Demand. Our unparalleled understanding of the role of technology in optimizing business processes and performance and our best practices guidance are rooted in our rigorous research-based benchmarking of people, processes, information and technology across business and IT functions in every industry. This benchmark research plus our market coverage and in-depth knowledge of hundreds of technology providers means we can deliver education and expertise to our clients to increase the value they derive from technology investments while reducing time, cost and risk.

Ventana Research provides the most comprehensive analyst and research coverage in the industry; business and IT professionals worldwide are members of our community and benefit from Ventana Research's insights, as do highly regarded media and association partners around the globe. Our views and analyses are distributed daily through blogs and social media channels including [Twitter](#), [Facebook](#), [LinkedIn](#) and [Google+](#).

To learn how Ventana Research advances the maturity of organizations' use of information and technology through benchmark research, education and advisory services, visit www.ventanaresearch.com.



Appendix: About This Benchmark Research

Methodology

Ventana Research conducted this benchmark research on the Web from December 2014 through March 2015. We solicited survey participation via email, our website and social media invitations. Email invitations were also sent by our media partners and by vendor sponsors.

We presented this explanation of the topic to participants prior to their entry into the survey:

Cloud computing – utilizing the public or a private cloud infrastructure to license or deploy software – provides an increasingly popular alternative to storing and maintaining systems on an organization’s own premises, and interest is growing rapidly in the use of the cloud for analytics and business intelligence (BI) systems that can access and use data. This benchmark research will focus on cloud-based approaches for data and analytics that can enable more effective business decision-making and efficient operations.

The following promotion incited participants to complete the survey:

What’s In It For You? Upon completion of the research, all qualified participants will receive a report on the findings of this benchmark research to support their organization’s efforts, along with a \$5 Amazon.com gift certificate. In addition, all qualified participants will be entered into a drawing to win one of 25 benchmark research reports and a 30-minute consultation, a package valued at US\$1,495 or €1,232. Thank you for your participation!

Qualification

We designed the research to assess the use of and plans for data and analytics in the cloud across organizations and industries. Qualification to participate was presented to participants as follows:

The survey for this benchmark research is designed for executives and senior management, vice presidents, directors, managers and users of



data and analytics involved with the purchasing of this technology for operating in the cloud. Solution providers, software vendors, consultants, media and systems integrators may participate in the survey, but they are not eligible for incentives and their input will be used only if they meet the qualifications. Incentives are provided to qualified participants in the research and also are conditional on provision of accurate contact information including company name and company email address that can be used for fulfillment of incentives.

Further qualification evaluation of respondents was conducted as part of the research methodology and quality assurance processes. It entailed screening out responses from companies that are too small, questionnaires that were not materially complete, or those where the submission is from an inappropriate submitter or appears to be spurious.

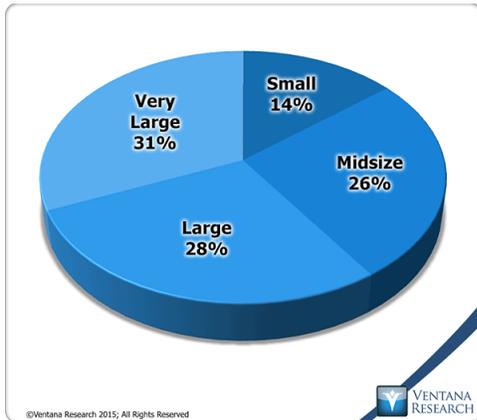
Demographics

We designed the survey used for this research to be answered by executives and managers across a broad range of roles and titles working in organizations. We deemed 214 of those who clicked through to this survey to be qualified to have their answers analyzed in this research. In this report, the term “participants” refers to that group, and the charts in this section characterize various aspects of their demographics and qualifications.



Company Size by Workforce

We require participants to indicate the size of their entire company. Our research repeatedly shows that size of organization, measured in

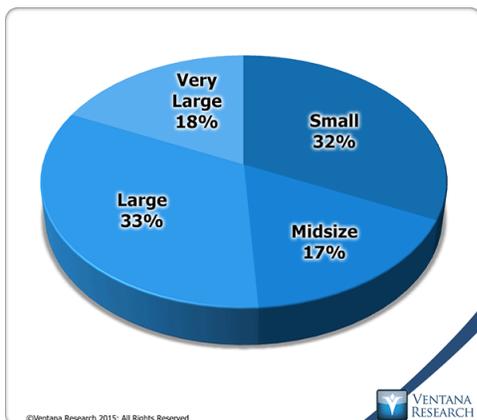


this instance by employees, is a useful means of segmenting companies because it correlates with the complexity of processes, communications and organizational structure as well as the complexity of the IT infrastructure. In this research, participants represented a broad range of organization sizes in numbers increasing at each larger segment: 31 percent work in very large companies (having 10,000 or more employees), 28 percent work in large companies (with 1,000 to 9,999 employees), 26 percent work in

midsize companies (with 100 to 999 employees), and 14 percent work in small companies (with fewer than 100 employees). This distribution is consistent with prior benchmark research and our research objectives and provides a suitably large sample from each size category.

Company Size by Annual Revenue

When we measured size by annual revenue, the distribution of categories shifted downward; in particular, significantly fewer

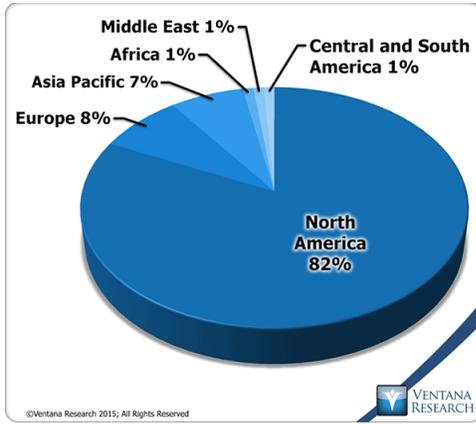


companies fell into the very large category and more than twice as many are small. By this measure, 13 percent fewer are very large companies (having revenue of more than US\$10 billion), 5 percent more are large companies (having revenue from US\$500 million to US\$10 billion), 9 percent fewer are midsize companies (having revenue from US\$100 to US\$500 million), and 18 percent more are small companies (with revenue of less than US\$100 million). This sort of redistribution is typical in our research

projects when we measure by revenue instead of head count.

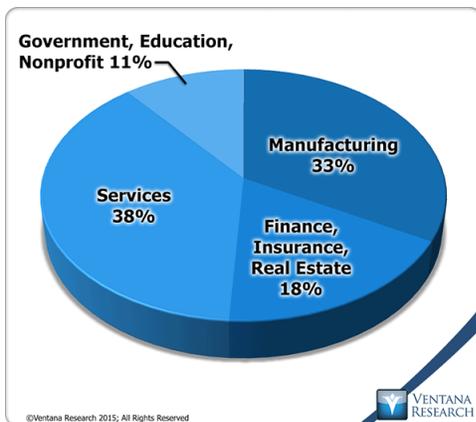


Geographic Distribution



A large majority (82%) of the participants were from companies located or headquartered in North America. Those based in Europe accounted for 8 percent, in Asia Pacific for 7 percent and in the rest of the world for the remaining 3 percent. This result was in keeping with our expectations at the start of this investigation, since organizations participating in our research most often are headquartered in North America. However, many of these are global organizations operating worldwide.

Industry

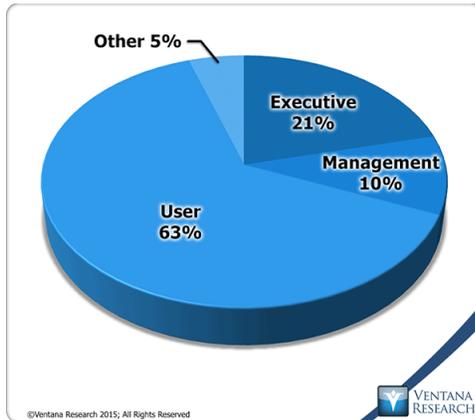


The companies of the participants in this benchmark research represented a broad range of industries, which we have categorized into four general categories as shown to the left. Companies that provide services accounted for 38 percent and those in manufacturing accounted for 33 percent. Those in finance, insurance and real estate accounted for 18 percent. Government, education and nonprofits accounted for the balance.

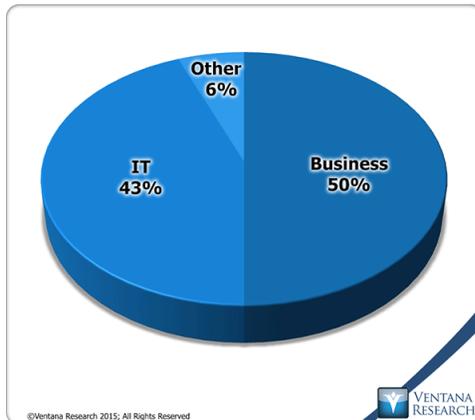


Job Title

We asked participants to choose from among 14 titles the one that best describes theirs. We sorted these responses into four categories:



executives, management, users and others. Slightly fewer than two in three identified themselves as having titles that we categorize as users, a grouping that includes director (19%), senior manager or manager (25%), analyst (14%) and staff (4%). One-fifth are executives, and another 10 percent are management, by which we mean vice presidents. Others, in this case consultants and educators, accounted for the balance. We concluded after analysis that this response set provided a meaningfully broad distribution of job titles.



Role by Functional Area

We asked participants to identify their functional area of responsibility as well. This enabled us to identify differences between participants who have differing roles in the organization. In this rather technical area 43 of the participants identified themselves as being in the IT organizations, and half work in the lines of business. Another 6 percent with miscellaneous roles comprised the remainder.