

ORACLE®



# Cloud Insights

A global survey by Longitude of 730 senior IT professionals exploring current and planned use of the cloud.



# Contents



# Foreword

**Steve Daheb**

Senior Vice President,  
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Despite the fact that cloud technologies have the ability to dramatically transform how businesses run and how people work and live, the overwhelming majority of workloads still reside on premises. Why? At Oracle, we think it's fairly simple: Moving to the cloud isn't easy. Achieving business transformation demands real change—not just in terms of systems but also, more importantly, in terms of people.

Individually and collectively, our ability to embrace change reflects our willingness to accept the unknown, and ultimately unlocks our potential to imagine and succeed. Overcoming the fear of the unknown is difficult, but this report, based on a survey of 730 C-suite and senior IT executives from 13 countries, should encourage those organizations still on the fence when it comes to cloud adoption.

The independent research shows that companies with the most cloud exposure (on average 70 percent or more of their applications in the cloud) not only report the highest levels of confidence in the cloud, but have also seen the greatest increases in their productivity and competitiveness.

These leaders have developed greater insights from their data, and report higher levels of innovation. They've seen the greatest cost reductions from integrating apps, data, and processes, and are moving to the next level of integration, where they're benefiting from faster app performance.

And, crucially, the most surprising—and reassuring—insight from the survey concerns security. It's often cited as one of the biggest challenges for cloud migration, but the survey finds those with the highest levels of exposure report the highest levels of confidence in cloud security.

At Oracle, we understand that our customers are all at different stages in their cloud journeys. Some are only just getting started, while others have already made tremendous strides. And we know that every journey has its challenges.

Regardless of where your company stands on its path to transformation, the experiences of your peers as outlined in this research should give you confidence. The change we fear may well turn out to be easier than we expect, and the rewards far greater.

We look forward to joining you on your journey.

Steve Daheb

A handwritten signature in black ink, appearing to read 'Steve Daheb', with a large, stylized loop at the end.



# Cloud as a Platform for Business Transformation: From Idea to Implementation

## Analysis of a global survey on current and planned use of the cloud.

Longitude Research, sponsored by Oracle and Intel, surveyed 730 C-suite and senior IT executives online during late summer 2017, asking questions about their use of and plans for the cloud.

The respondents included CIOs, IT directors, developers, and IT security personnel, and came from 13 countries: Australia, Brazil, Canada, China, France, Germany, India, Mexico, Singapore, South Africa, the UAE, the UK, and the US.

All work in companies with annual revenues of US\$1 billion or more (13 percent in organizations with revenues of US\$10 billion or more). The following industries are represented: energy, automotive, consumer packaged goods, retail, healthcare, financial services, telecoms, media and entertainment, energy/utilities, and insurance.



## About the research and methodology.

Figures that are labeled with “total” show all the respondents in the sample who were qualified to answer that question.

The research also analyzes the proportion of respondent organizations’ applications that are currently in the cloud—their “cloud exposure.”

High cloud exposure: Organizations where, on average, 70 percent or more of their applications are either cloud native or have already been migrated. This is the cloud-mature group.

Medium cloud exposure: Organizations where, on average, between 50 and 69 percent of their applications are either cloud native or already migrated.

Lower cloud exposure: Organizations where, on average, less than 50 percent of their applications are in the cloud.

Some answers in the Figures do not total 100% percent due to rounding. We have removed the don’t know percentages to allow for better comparison of the data.



# Executive Summary

To add context to the research survey, a number of IT executives and technology leaders were interviewed about their experience of the evolution of cloud.

Their views suggested that across the world, cloud is no longer just an enterprise technology trend—it's now considered fundamental to any progressive IT strategy.

"You need a very strong argument if you want to implement something new that is not based on cloud services," says one senior IT executive interviewed for this survey. According to another: "The conversation about whether one should move to the cloud is no longer relevant. It's just a question of how to use different cloud assets for specific business and tactical needs."

And the primary challenge is no longer just security. Instead, the main focus is finding the right expertise—whether from internal talent or external partners—to help develop, refine, and deliver your cloud strategy.

This extensive global research offers detailed insights into the experiences of cloud adoption, and offers fresh perspectives for senior IT decision-makers.

"You need a very strong argument if you want to implement something new that is not based on cloud services."

"The conversation about whether one should move to the cloud is no longer relevant. It's just a question of how to use different cloud assets for specific business and tactical needs."



# Cloud Implementation: Key Findings

This research reveals that a large number of organizations around the world and across industries already embrace the cloud. Those surveyed\* have migrated an average of 29 percent of their applications to the cloud, and are in the process of migrating another 25 percent. Just under a quarter of their applications are cloud-native.

Meanwhile, an elite group of “cloud-mature” companies has gone much further, with, on average, 70 percent or more of their applications either cloud-native or already migrated.

Regardless of how mature their cloud environment is, respondents identify similar benefits and challenges. The research provides invaluable insight into the experiences and ambitions of senior IT professionals across six key areas:

- 1. Moving workloads reaps rewards.**  
In moving to the cloud, more than half of respondents report improvements in application performance, application integration, choice of deployment models, and application governance and security. Among their chief migration challenges are ensuring business continuity, minimizing gaps in regulatory compliance, and maintaining visibility and control.

- 2. Modernizing data management allows for experimentation.**

Cloud data management improves the way organizations use data. Eight in 10 cloud-mature companies, for example, report a greater ability to experiment with different data models, and 77 percent say the same about generating better insights from data—a primary motivation for managing their data in the cloud.

- 3. Deployment yields competitive advantages.**

Developing and testing applications in the cloud clearly helps improve business innovation and competitiveness. More than 60 percent of executives report increased innovation levels since moving Dev/Test to the cloud, and more than half say the same about competitiveness. There’s also marked improvement in release code speed, channel deployment, and developer speed.

\*Those able to provide a complete answer to each stage of the cloud journey



## 4. Applications benefit from connection and extension.

Platform as a Service (PaaS) is having a positive impact in several aspects of application integration. More than half of respondents point to a greater ability to integrate cloud and on-premises applications, connect applications through integrated data streams, and add functionality and services to applications. A major challenge when connecting applications across platforms and environments—particularly for cloud-mature companies—is ensuring features are not lost following integration.

## 5. Cloud improves the ability to drive better insights.

Cloud-mature companies have greater capacity for data analytics. More than 60 percent of the cloud-mature group report a greater ability to analyze most types of data, in addition to improved automation and visualization, based on machine learning. More than half also point to strong capabilities with non-relational data. Around four in 10 of the overall sample, meanwhile, point to improvement in these areas, which suggests that the more mature an organization's cloud implementation, the greater the potential to gain insights from its data.

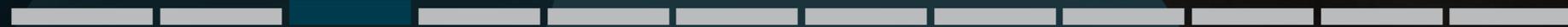
## 6. Modernized security maximizes confidence.

The higher its level of cloud maturity, the greater an organization's confidence in its security capabilities. This contradicts the widespread perception that vulnerabilities are greater in the cloud, although data security is still perceived by firms as the greatest challenge they face in moving data management to the cloud. Security, loss of business continuity, a lack of control, and potential gaps in regulatory compliance are among executives' biggest worries about migration. One particular cause for concern was that only 14 percent were compliant with the European Union's General Data Protection Regulation (GDPR); even among the cloud-mature companies, only a minority (34 percent) were compliant.

Cloud-mature firms outperform the rest of the surveyed companies in several aspects of application and infrastructure management, as well as performance. In this group, nearly three-quarters of the participants also report improved visibility and better management as the top benefits of moving to the cloud.



# Cloud Intent



# Cloud Intent

To reach the desired destination, any journey must first be mapped. When it comes to business initiatives, that means strategy development and planning.

Cloud implementation is no different. Such a significant change in IT delivery systems requires a longer-term vision of what they should look like in five to 10 years. If initiatives are not planned—and individual teams or units pursue their own agendas—the results can be chaotic.

Without a clearly thought-out strategy, says Conny Björling, head of enterprise architecture at global construction firm Skanska, organizations risk replicating their internal on-premises structures in the cloud. “That could be extremely painful,” he warns.

With this in mind, it’s encouraging that more than one-third of IT executives surveyed report that their organization’s cloud strategies are fully developed and already largely implemented. An even larger proportion report that their strategy implementation is under way. One-fifth, however, say their strategy development for cloud is still in its infancy.

## Cloud benefits.

What are IT leaders saying they hope to achieve by shifting to the cloud?

Faster time-to-market is a top priority. “Whether it’s speed in launching new applications, reaching into new geographies, or making the most of deployed infrastructure, faster time-to-market is a huge benefit of the cloud,” says Jeff Wittich, director of Intel Corporation’s Cloud Service Provider Business.

For Pragmatyxs, a Washington-based systems integrator, the time to market benefit of cloud also applies to its customers. “Our cloud initiative is centered around taking the work we’ve done on premises for our customers over the last 20 years and redeploying that to the cloud,” says Paul Van Hout, the firm’s CEO and founder. “This is primarily to reduce our customers’ and our own time to market—the ability to quickly deploy the types of solutions that generate real business value.”

Most survey respondents concur with Van Hout’s sentiment. Nearly 70 percent say moving to the cloud will enable them to meet customers’ needs more effectively (see Figure 1).



Time-to-innovate is another priority for senior IT people. “When done well, moving to the cloud allows you to focus more on where as an organization you can add value,” explains James Stewart, independent consultant (and former deputy chief technology officer for the UK government). “It reduces the amount of time you have to put into managing the complexity of a large on-premises infrastructure. You get that time back to apply to other, value-adding initiatives—particularly innovation. And being in the cloud, with a major cloud provider, gives you access to innovation that’s in the market.”

Executives from the small number of companies that have fully executed strategies are more definitive.

More than seven in 10 (72%) say: Moving our applications, DevOps, and workloads to the cloud is integral to our organization being competitive.”

### Attitudes toward cloud (total).

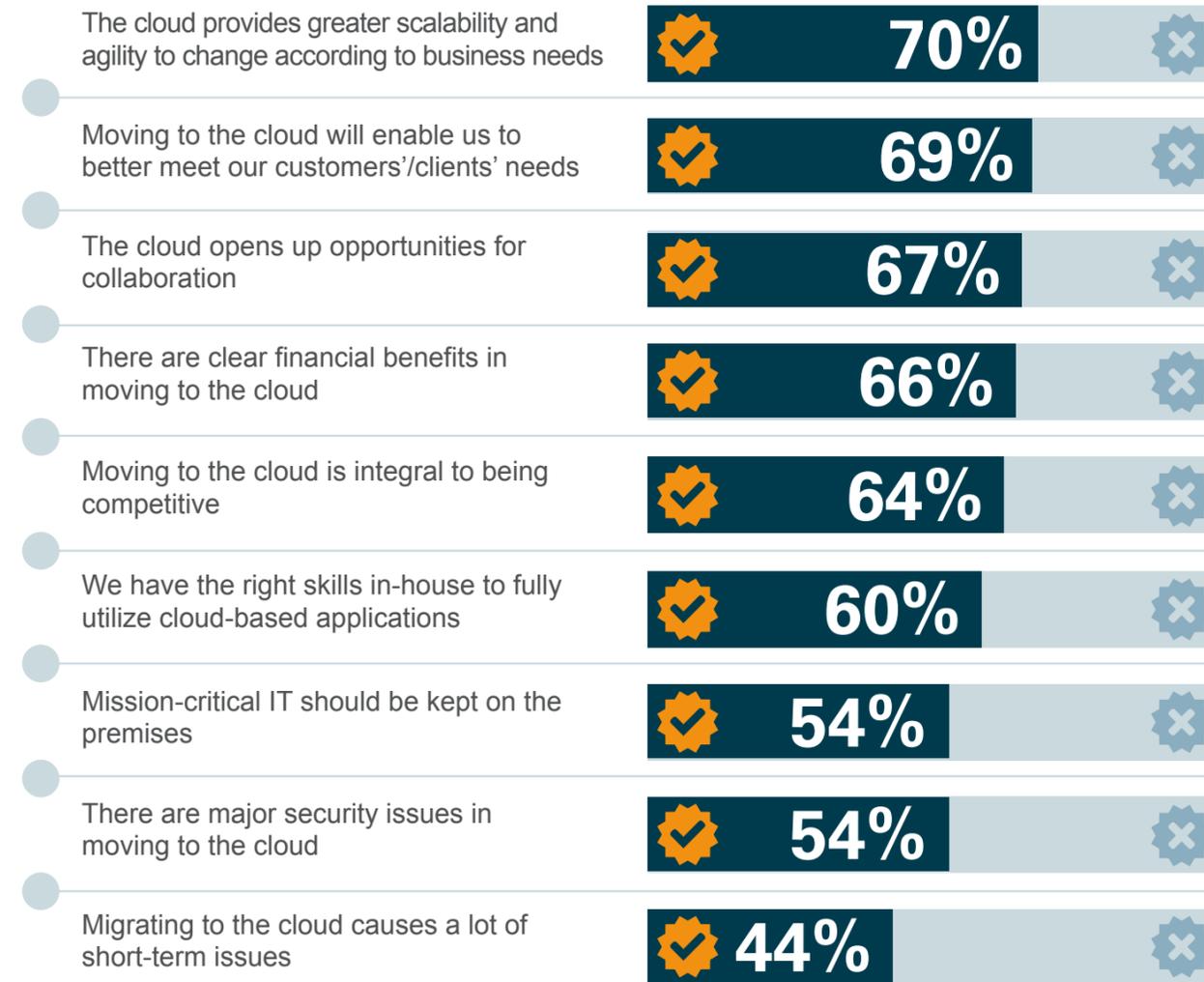


Figure 1: Please tell us the extent to which you agree or disagree with the following statements.



# Cloud in Action



# Cloud in Action

Adoption of cloud reflects organizations' wide range of strategies, and the different speeds at which they move.

Respondents\* to the survey have so far managed to migrate 29 percent of their applications, and are in the process of migrating another 25 percent. Just under a quarter of their applications are cloud-native (developed from scratch in the cloud). The remainder are yet to be migrated or will remain on premises.

These averages conceal very different levels of cloud maturity. Among a select group with a high degree of maturity, on average 70 percent or more of their applications are either cloud-native or have been migrated (see figure 3).

## Proportion of applications in the cloud and expected change within three years.

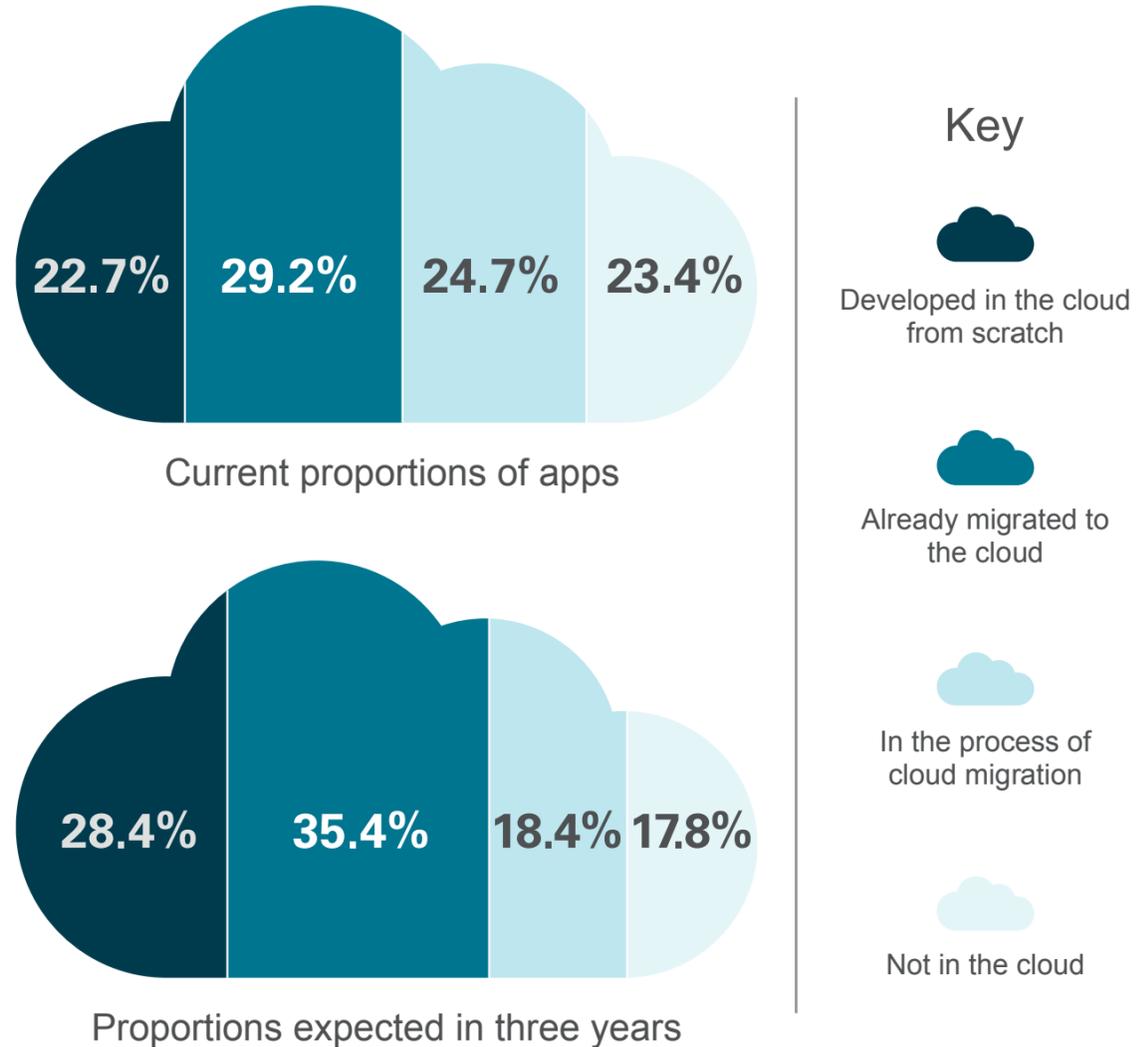
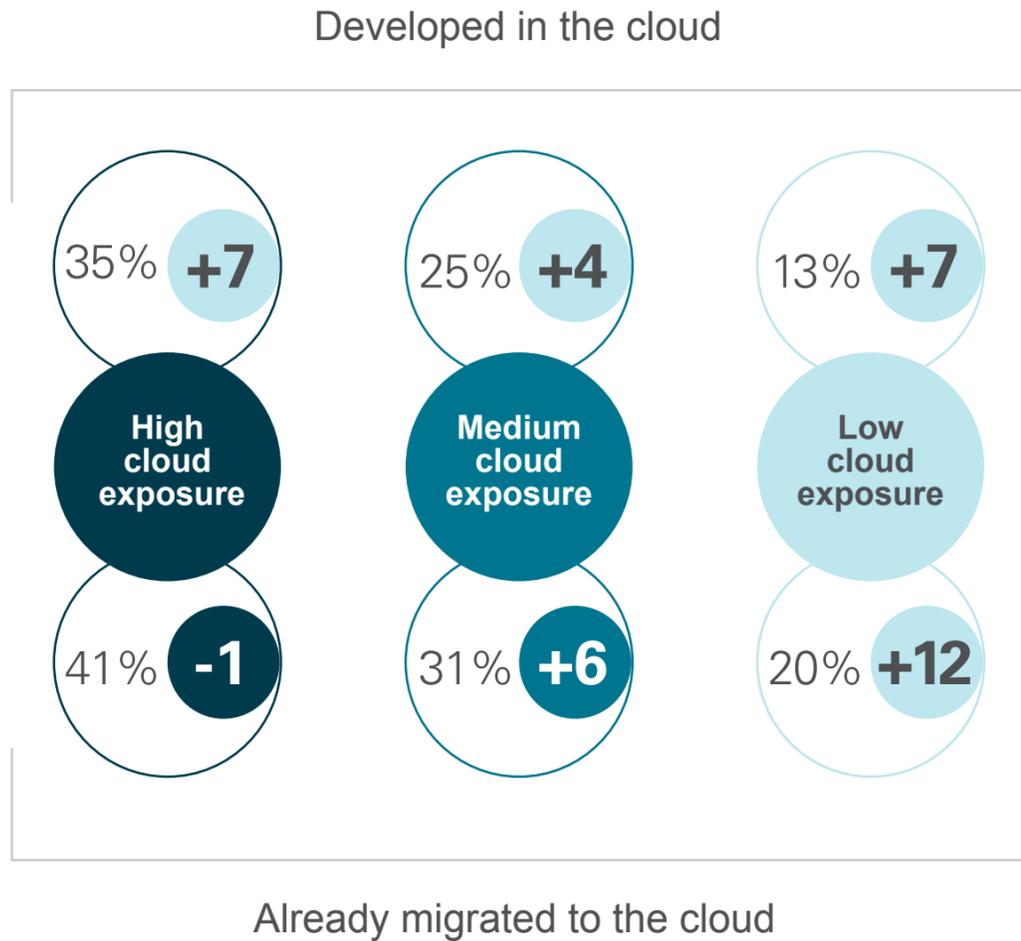


Figure 2: Proportion of applications in the cloud.

\*Those able to provide a complete answer to each stage of the cloud journey.



### Proportion of applications in the cloud and expected change within three years (cloud exposure).



**Figure 3:** Proportion of applications in the cloud and expected change within three years: percentage shares of firms with “high,” “medium” and “lower” exposure to the cloud.

### Comfortable in the cloud.

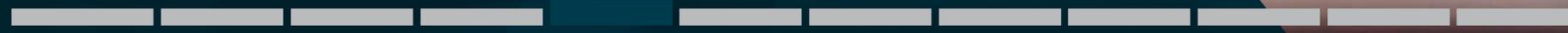
One marked difference between cloud-mature companies and the others is their greater level of comfort with the public cloud. Cloud-mature organizations host as many applications in the public cloud as on private cloud; for other respondents, the latter dominates. The use of multiple public and private clouds is also more prevalent among cloud-mature businesses.

Pragmatyxs, which has customers in the heavily regulated medical, pharmaceutical, and food industries, employs a mixture of public cloud and on-premises operations. “Most of our service and execution are done in the cloud,” says Paul Van Hout. “But data for regulated products needs to come back on premises to support quality and audit requirements.”

Consultant James Stewart has advice for those using multiple clouds. “If your hybrid cloud approach is going to take you several years, you need to be really confident that is still going to keep you ahead. And that the public cloud won’t have developed everything that you were missing—as well as better migration techniques.”



# Cloud in Detail



# Cloud in Detail

Cloud implementation is complex. Its routes and time frames are varied, and there may be different starting points; the stages overlap and can occur in a variety of sequences. Broadly, these stages fall into three phases.

## The phases of cloud implementation.

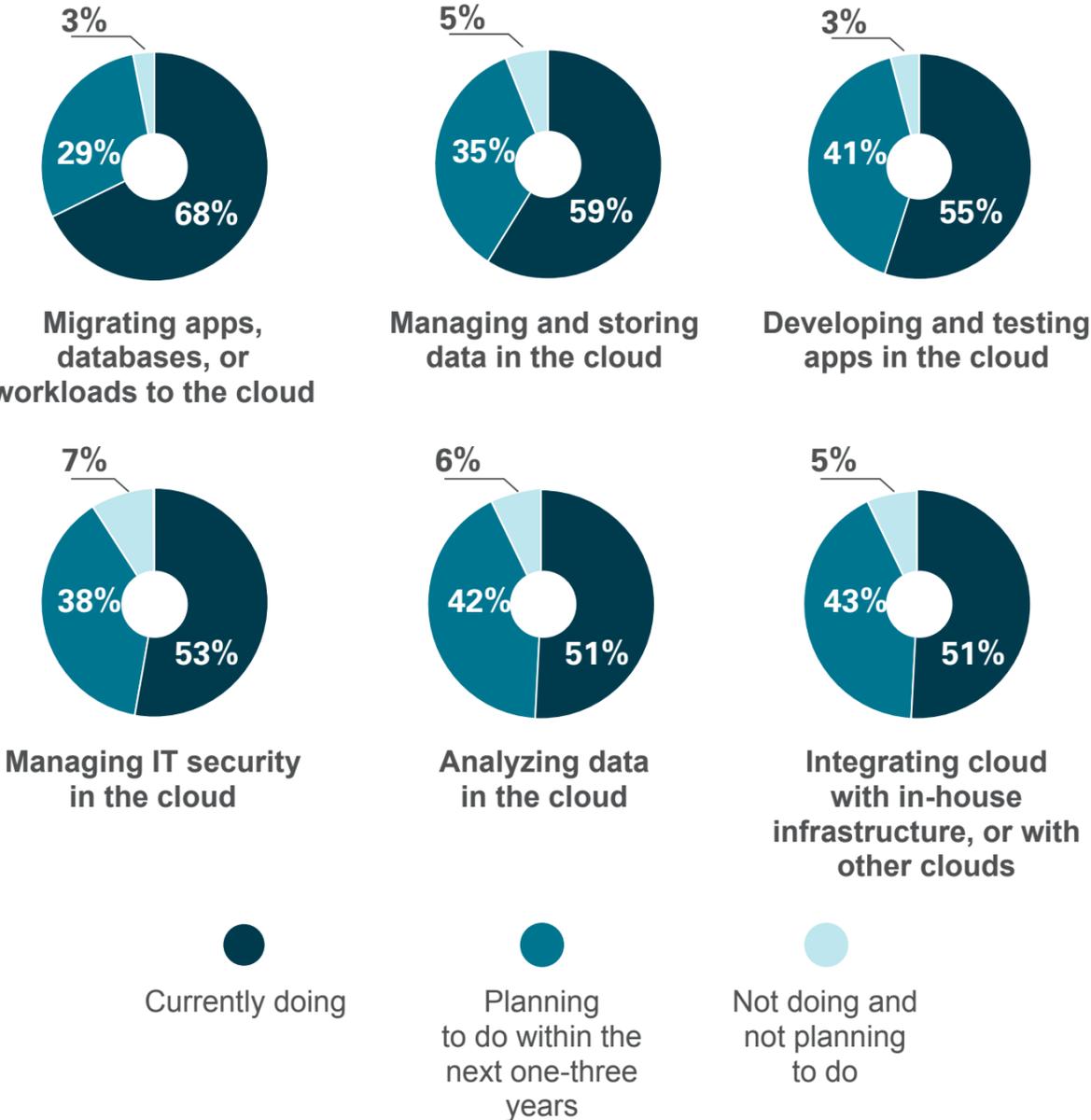
The first phase could be called “migration.” It involves Software as a Service (SaaS), which, for many companies, is the starting point for implementation. It also comprises the shifting of existing applications to the cloud, and businesses may at this point begin to develop and test new applications there.

Another phase is “extension,” during which companies connect with and integrate cloud-based and on-premises applications. Mobile, interactive, and web apps will be extended or built entirely in the cloud environment.

Some organizations, though not all, move to a third phase—“transformation”—in which they systematically unlock insights from their data, and use these to develop entirely new business models.

Each of these phases requires different motivations and priorities on the part of companies and reveals new barriers to overcome. Each also has a different impact on IT performance. Unsurprisingly, in almost every case, the impact is considerably more positive for cloud-mature companies.

## The stages reached by firms on their cloud journeys.



**Figure 4:** What are you currently doing in your organization regarding cloud services, and what are you planning to do?



# Move Workloads



# Move Workloads

Most organizations appear to be obtaining the benefits from migration they expected. These particularly show through in application performance, application integration, choice of deployment models, and application governance and security.

Shifting workloads and applications into a cloud environment, however, tests the identity of a business: How much are they willing to invest, how much are they willing to be disrupted, and what is their level of risk aversion?

“People often get paralyzed by the apparent immensity of the migration challenge,” says consultant James Stewart. “If you’ve got a large estate, it’s tempting to want to migrate all of it in one step—a ‘big bang’ mentality. Instead, it would be better to ask, ‘Where’s a good place to start?’ Effective migration requires companies to find a good starting point.”

Companies will need to ask questions about each workload and application up front. How complex is it? How mission-critical is it? How much risk does downtime of the application pose to the business? Next, which workloads lend themselves best to the cloud, or which lend themselves best to remaining on premises? Those to be moved can then be prioritized according to ease of migration; this allows more time for recoding or other work required on more-complex workloads.

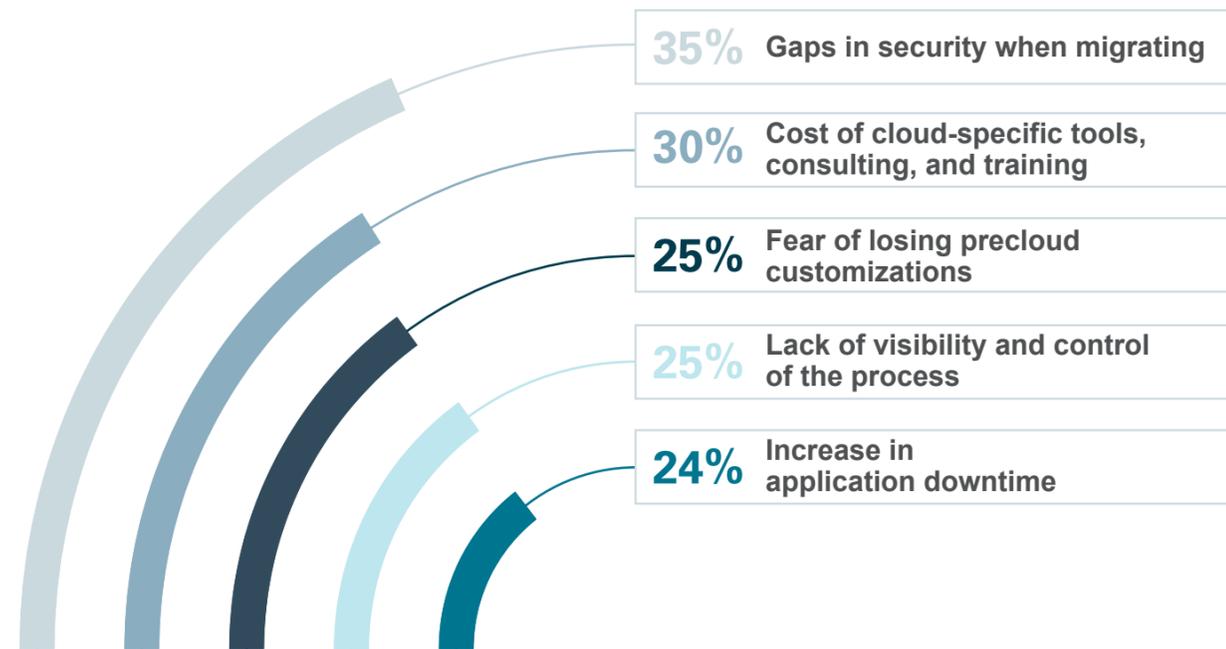
An organization can only arrive at this point if it has a thorough understanding of the current environment. Only then can it measure performance (of data, apps, and user experience) in the new environment and make adjustments as it moves workloads to—or starts building in—the cloud.

Intel, according to Jeff Wittich, has looked at 20 categories of workload and rated them against business criteria and four specific technical criteria: Performance, security, integration, and data volume. After answering specific questions about each workload—for example, “How important is latency?” and “How much data is stored in each application?”—Intel recommends a migration path (public or private) that corporations should take for different workloads.

There are few simple, “switch-on/switch-off” answers to migration questions. Many workloads, such as extreme-scale databases, may be better kept running on specific on-premises hardware and then connected to cloud applications using high-speed, secure networking. In fact, there are likely to be some workloads that, from a cost or technology standpoint, should not be moved at all.



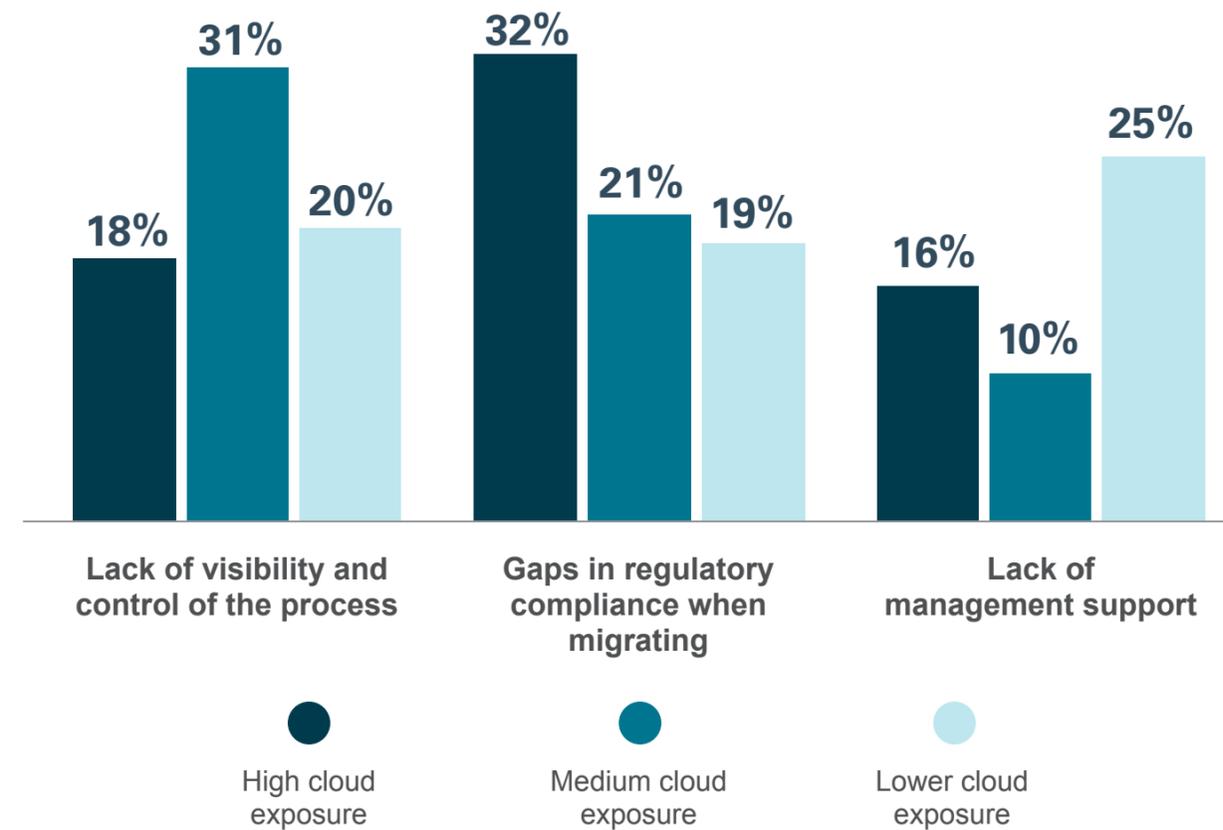
### Barriers to migration (total).



**Figure 5:** What do you see as the key challenges regarding migration of applications and workloads to the cloud? Respondents selected up to three out of 12 possible challenges. Chart above shows most frequently selected responses. Respondents selected their answer on a seven-point scale.

Security, loss of business continuity, a lack of control, and potential gaps in regulatory compliance are among executives' biggest concerns about migration. The latter is of particular concern among financial services respondents, who also worry about a lack of management support. Executives within cloud-mature organizations also say that plugging gaps in regulatory compliance is a key challenge (see figure 6).

### Barriers to migration (cloud exposure).

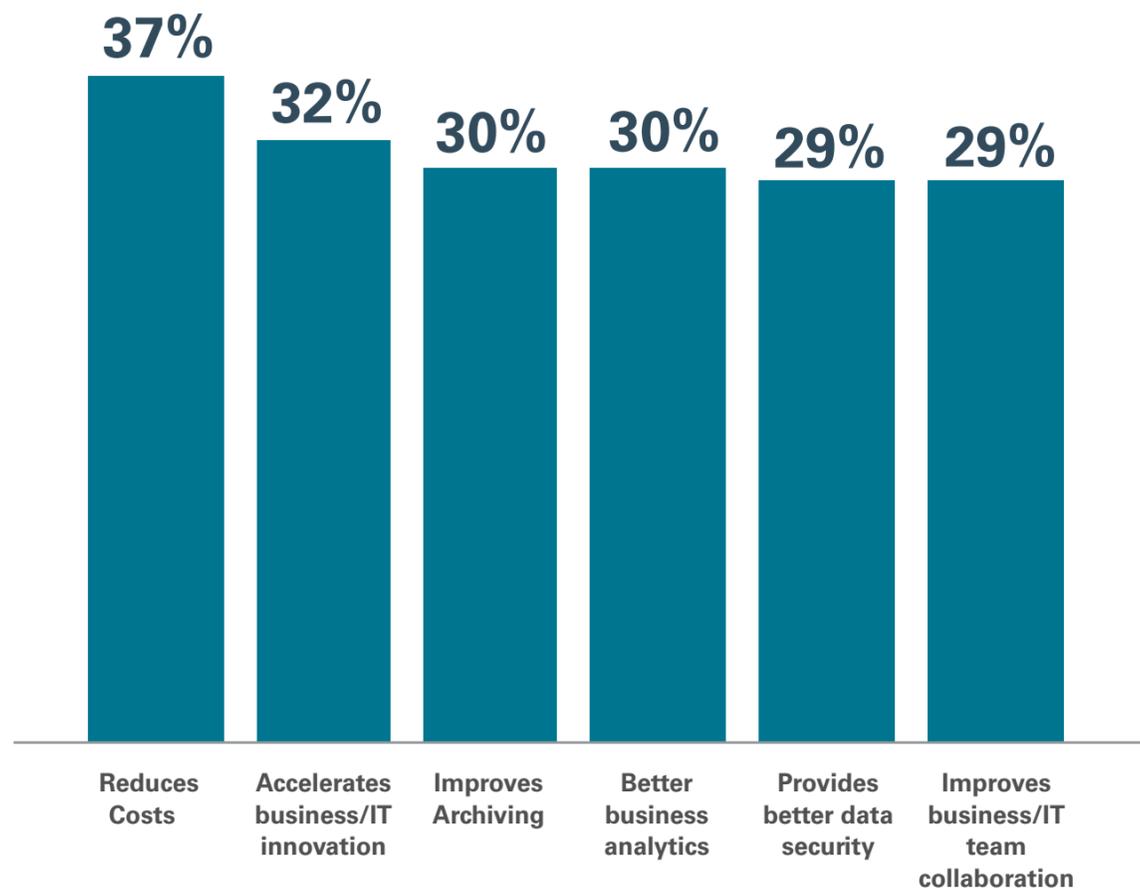


**Figure 6:** This chart reflects only those organizations with high/medium/lower cloud exposure.

For example, it must be clear exactly where data resides and who has access to it, inside and outside the organization. The migration strategy should also determine who is responsible for managing compliance, because any existing regulatory certification will have to be met while migration is under way.

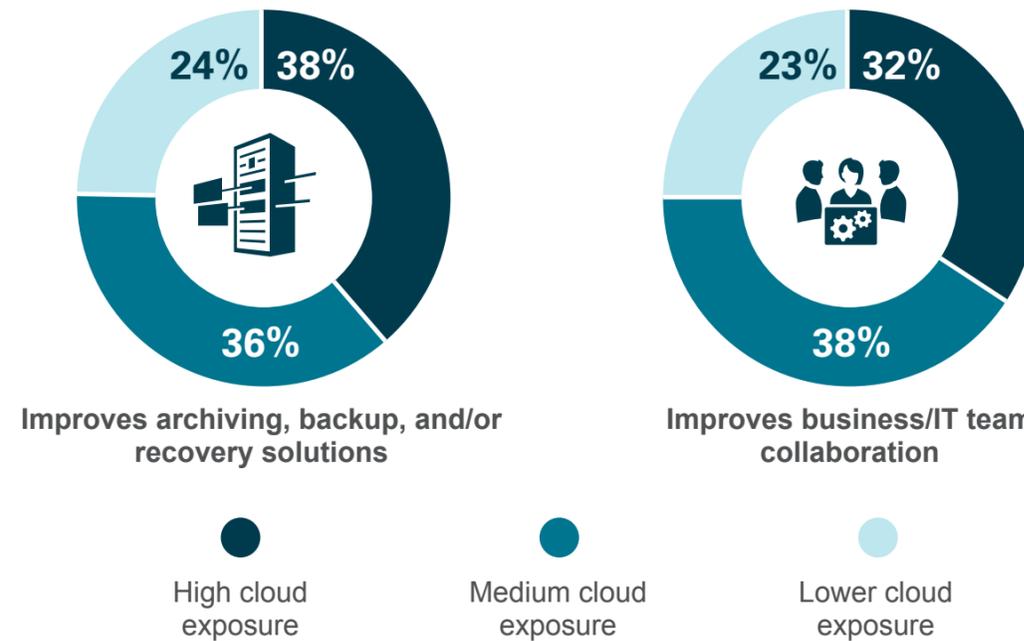


### Benefits of migration (total).



**Figure 7:** What do you see as the key benefits of moving applications and workloads to the cloud? Respondents selected up to three out of 10 possible benefits. Chart above shows most frequently selected responses.

### Benefits of migration (cloud exposure).

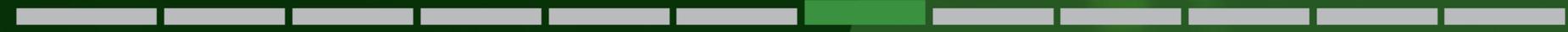


**Figure 8:** This reflects only those organizations with high/medium/lower cloud exposure.

Skanska has experienced relatively few issues during migration, according to Conny Björling. Potentially the riskiest process has been shifting on-premises data to analytics platforms in the public cloud, but this has gone smoothly. Björling acknowledges, however, that construction isn't currently a transaction-heavy industry—something that's likely to change in the next couple of years as the Internet of Things (IoT) generates much larger volumes of data. The data challenges in migration, he says, are likely to mount up accordingly.



# Modernize Data Management



# Modernize Data Management

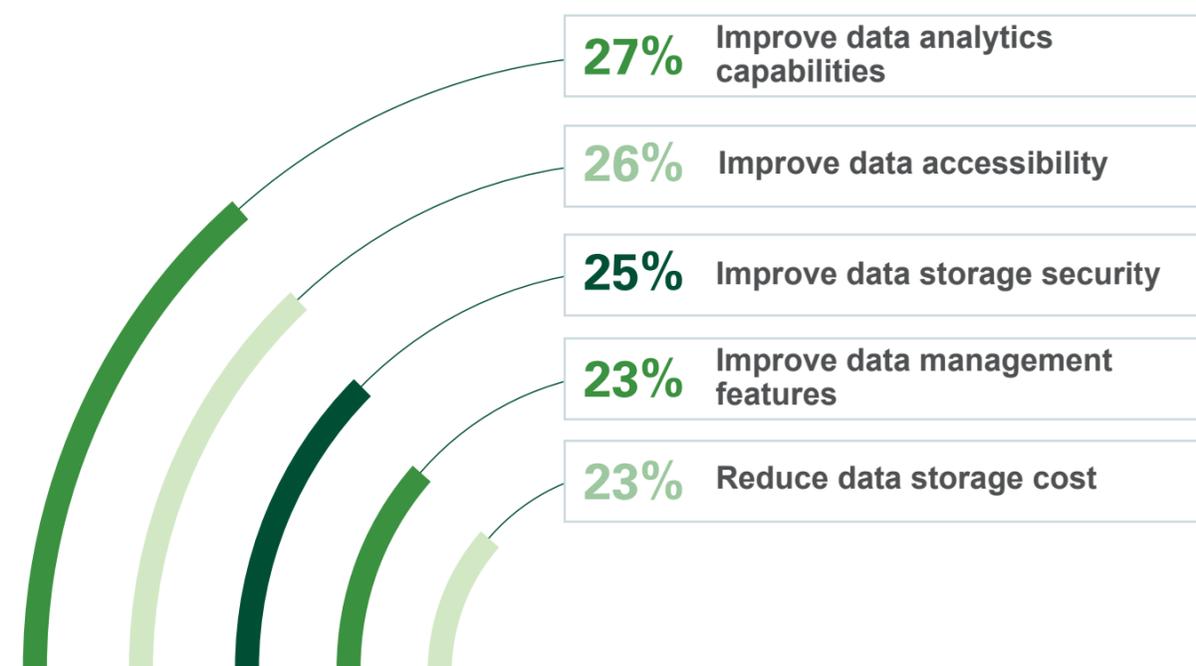
Six in 10 companies surveyed are managing and storing data in the cloud today, and another 35 percent plan to be doing so within three years (see figure 4).

They'll have to, because their data challenges and opportunities are set to become much greater over the next few years. For one thing, the growth of IoT, as Conny Björning, Skanska suggests, and the increasing commercial application of artificial intelligence (AI) techniques promise to produce a deluge of data.

That data must be secured, and companies' data platforms will need to support structured and unstructured data, and be able to scale quickly to support real-time analytics. Data platforms will have to allow companies to consolidate their multiple databases to reduce costs and improve data accessibility. These issues help explain why a majority of respondents (and a large majority of the cloud-mature group) are prioritizing the migration of their databases and data warehouses.

The same applies to migration of their advanced analytics tools. Companies say their primary motivation for managing data in the cloud is to improve their analytics capabilities. Put simply, they need to generate better insights from their growing volumes of data, and they're looking to cloud data management to help them achieve that.

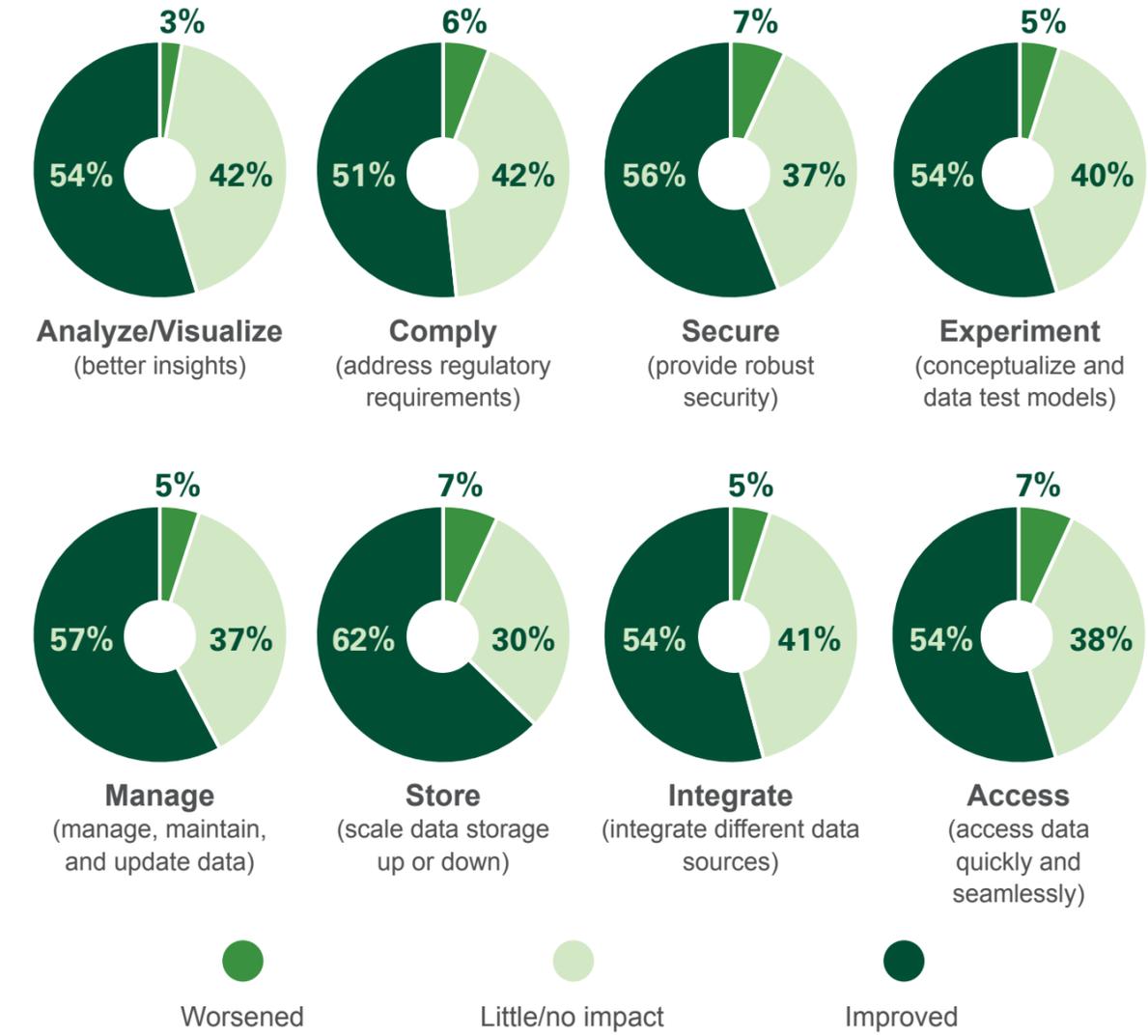
## Companies' motivations for managing their data in the cloud (total).



**Figure 9:** What were/are the key motivators driving you toward conducting data management in the cloud? Respondents selected up to three out of 10 possible motivations. Chart above shows most frequently selected responses.



### Cloud data management impact (total).



**Figure 10:** Please rate the extent to which you think managing data in the cloud will impact/has impacted the way you use data in the each of the following areas. Respondents selected their answer on a seven-point scale.

The first step is to create a repository that can aggregate upward multiple sets of information fed into it. This repository is likely to be a data warehouse that’s run in the cloud or on premises. The quicker the database can be created in the cloud, the faster the business can access data and start deriving insights from analytics tools.

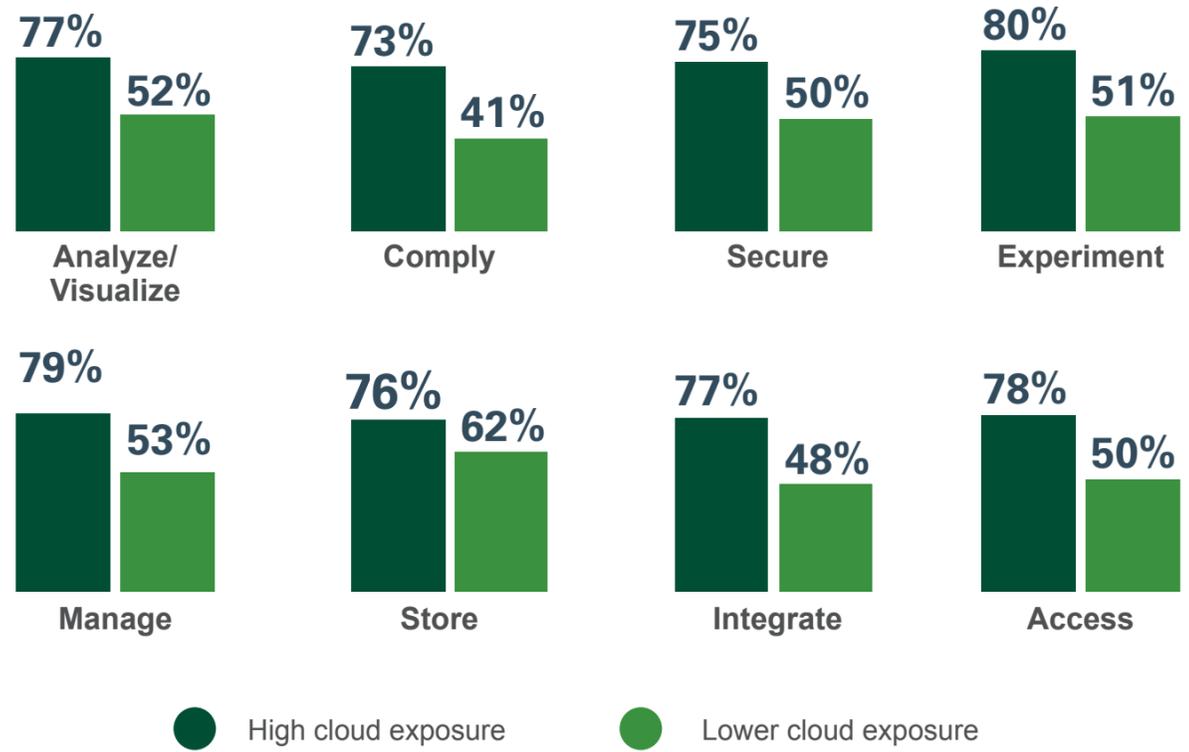
This is why it’s essential that the data management platform—whether managed on premises, in the cloud, or as part of a hybrid approach—can scale up to store and aggregate comprehensive sets of data from the IT and non-IT environments, including user-access data. The more comprehensive the data-sets, the more powerful the insights gathered.

Companies are seeing positive results from moving their data to the cloud. Most respondents report or expect better performance in several areas, including their ability to scale up storage, maintain and update data, and keep that data secure.

The actual and expected results in this area are considerably more pronounced for cloud-mature companies. Eight in 10 say they are able to experiment with different data models now they manage data in the cloud. Nearly as many (77 percent) say they can generate better insights (see figure 11). Rapid access to unstructured and structured data allows businesses to unearth trends and insights that would have previously gone unnoticed.



### Cloud data management impact (cloud exposure).



**Figure 11:** Please rate the extent to which you think managing data in the cloud will impact/has impacted the way you use data in each of the following areas. Respondents selected their answer on a seven-point scale.

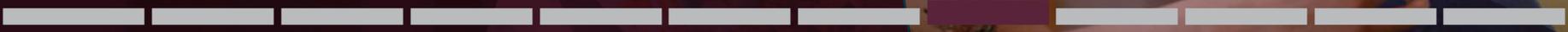
For consultant James Stewart, being more experimental is part of what moving to the cloud is all about. “Huge data opportunities are emerging from advances in areas such as AI and automation, and companies really need to be in a position where they can experiment quickly and cheaply,” he says. “This becomes possible if you’ve done your cloud migration right.”

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James Stewart  
Independent Consultant (and former Deputy Chief Technology Officer for the UK Government)



# Develop and Deploy



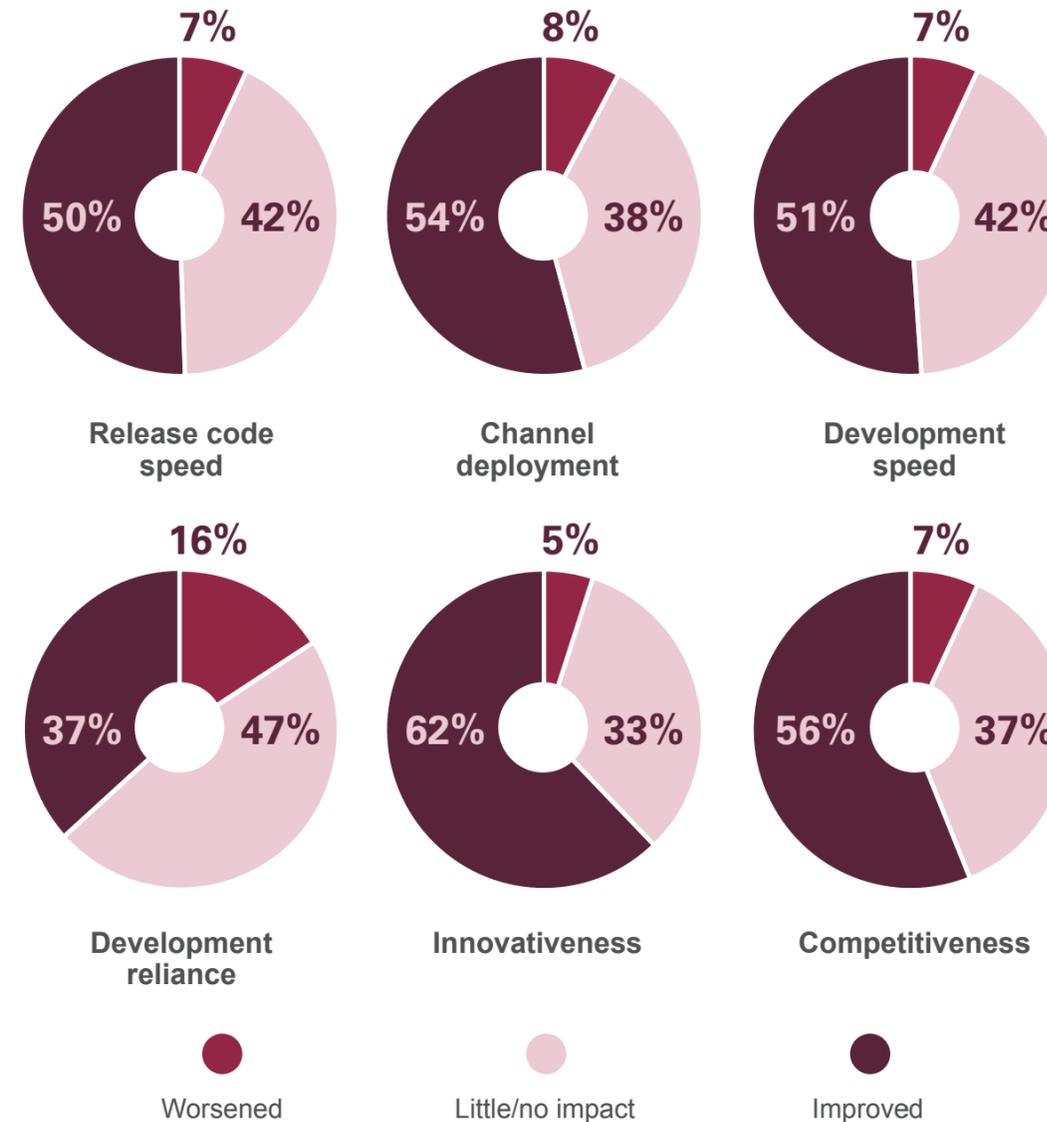
# Develop and Deploy

The survey shows that application development and testing in the cloud boosts innovation and competitiveness. More than six in 10 respondents report that their companies' innovation levels have increased, or are expected to, since development moved to the cloud. More than half say their business competitiveness has also improved.

The shift also leads to improvements in application development itself. Half of the organizations surveyed are releasing code faster, which may be a result of stronger monitoring of how code performs. More than half of companies also report improvements in channel deployment and development speed.

In each of these areas, cloud-mature companies significantly outperform the others surveyed.

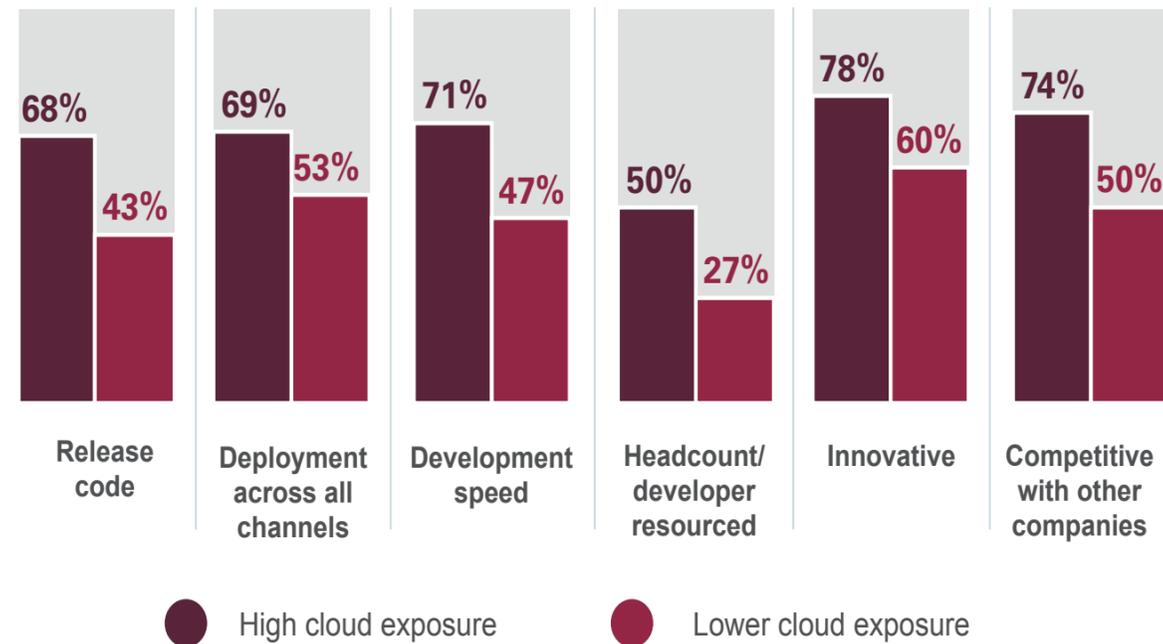
## Cloud development impact (total).



**Figure 12:** Please rate the extent to which you think developing applications in the cloud has impacted/will impact your business. Respondents selected their answer on a seven-point scale.



### Cloud development impact (cloud exposure).



**Figure 13:** Please rate the extent to which you think developing applications in the cloud has impacted/will impact your business. Chart above shows improvement. Respondents selected their answer on a seven-point scale.

Paul Van Hout of Pragmatyxs says development in the cloud has helped to instill greater discipline in the company’s application management overall. “We have to think a lot about change control and automated testing. When you’re on premises, the delays and bureaucracy give you almost no wiggle room in terms of efficiency. Deploying to the cloud has forced us to be more disciplined in deciding how to streamline, how to automate and improve testing, and how to communicate changes in our service to customers.”

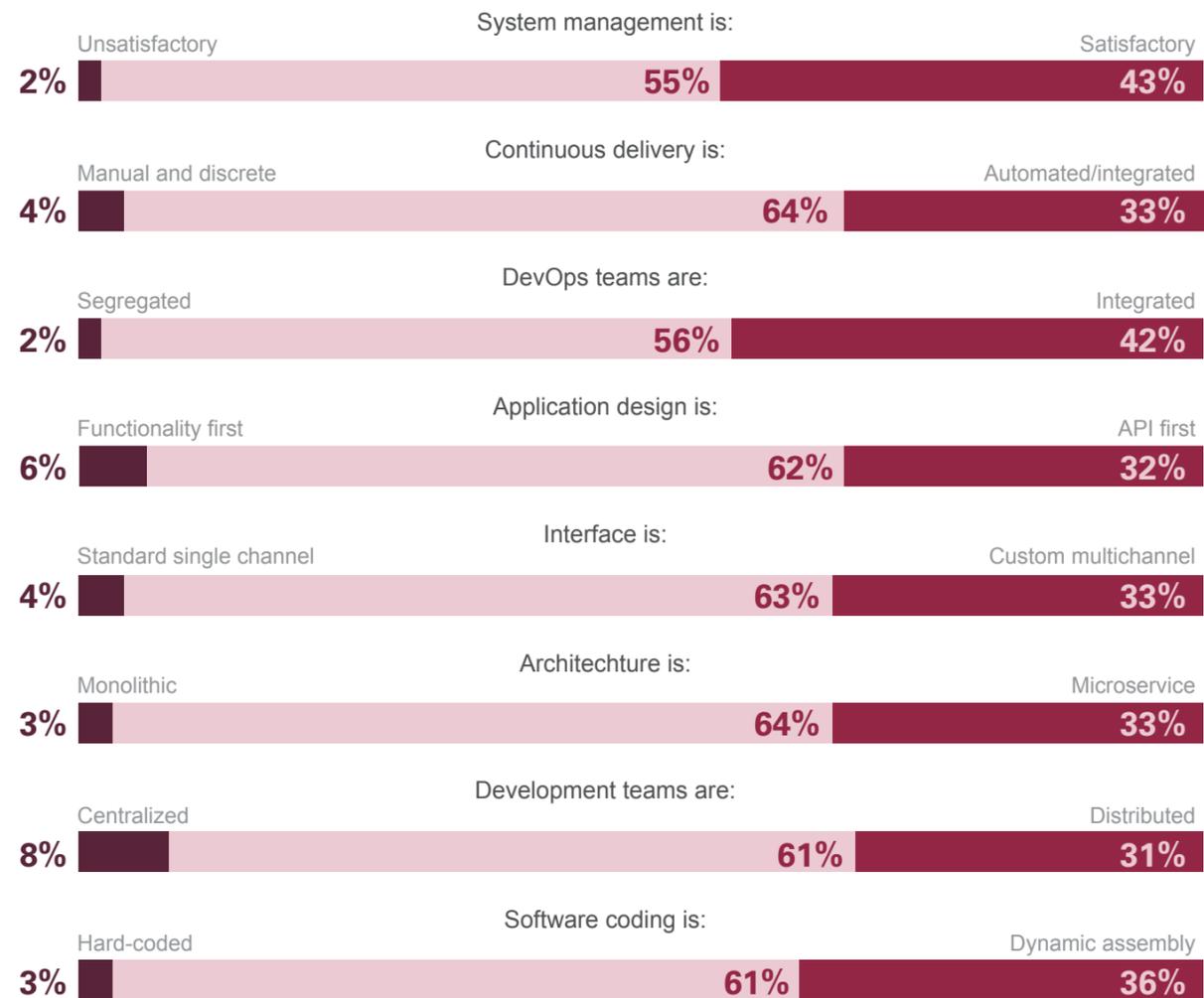
However, for all companies—including the cloud-mature group—improving organizational performance in this area remains a work in progress. Less than a third of the organizations in the survey report that application delivery is automated and integrated, APIs are the default for application design, they have a microservice architecture, and development teams are distributed (see figure 15).

“Deploying to the cloud has forced us to be more disciplined in deciding how to streamline, how to automate and improve testing, and how to communicate changes in our service to customers.”

Paul Van Hout  
 CEO and Founder  
 Pragmatyxs

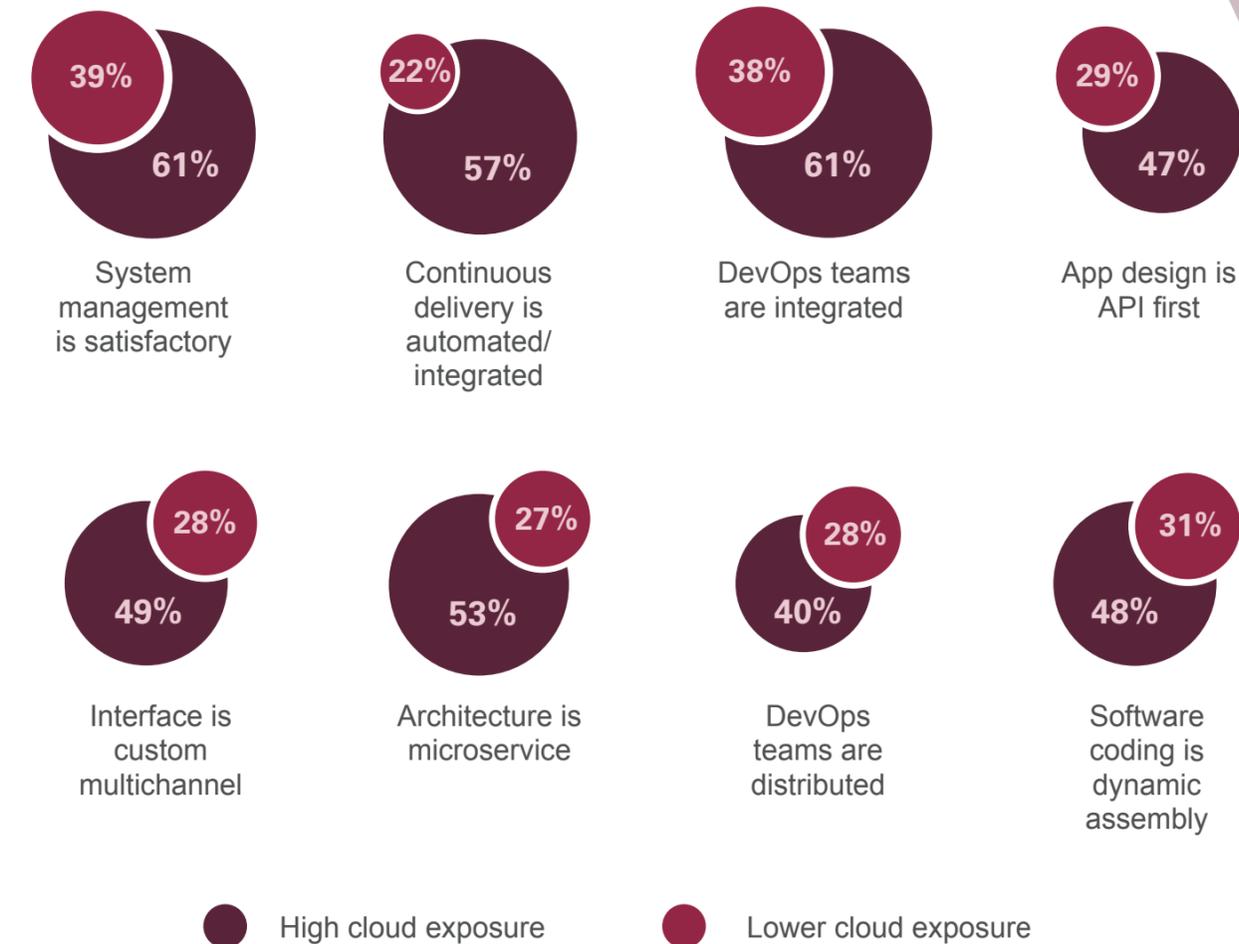


## Organization performance in development areas (total).



**Figure 14:** When it comes to software and feature development, how would you characterize your organization regarding each of these DevOps areas? Respondents selected their answer on a seven-point scale.

## Organization performance (cloud exposure).



**Figure 15:** When it comes to software and feature development, how would you characterize your organization regarding each of these DevOps areas? Respondents selected their answer on a seven-point scale.



For many firms, developing applications in the cloud continues to be hampered by a lack of resources, including in-house skills and developers, as well as concerns about cyberattacks, and the dependence on IT to approve developers' access to, for example, monitoring data to fix code defects.

According to Jerry Gearding, CTO of DX Marketing, network latency is likely to be a problem for companies with on-premises applications that need to communicate with their cloud environments.

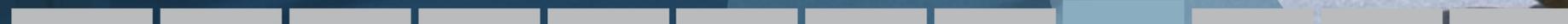
Gearding's company largely avoids that problem because its business intelligence service is in the cloud.

“One of the benefits of our cloud environment is that we can spin up compute instances and develop applications in the cloud, So we're able to work around the network latency issue.”

Jerry Gearding  
CTO  
DX Marketing



# Connect and Extend Applications

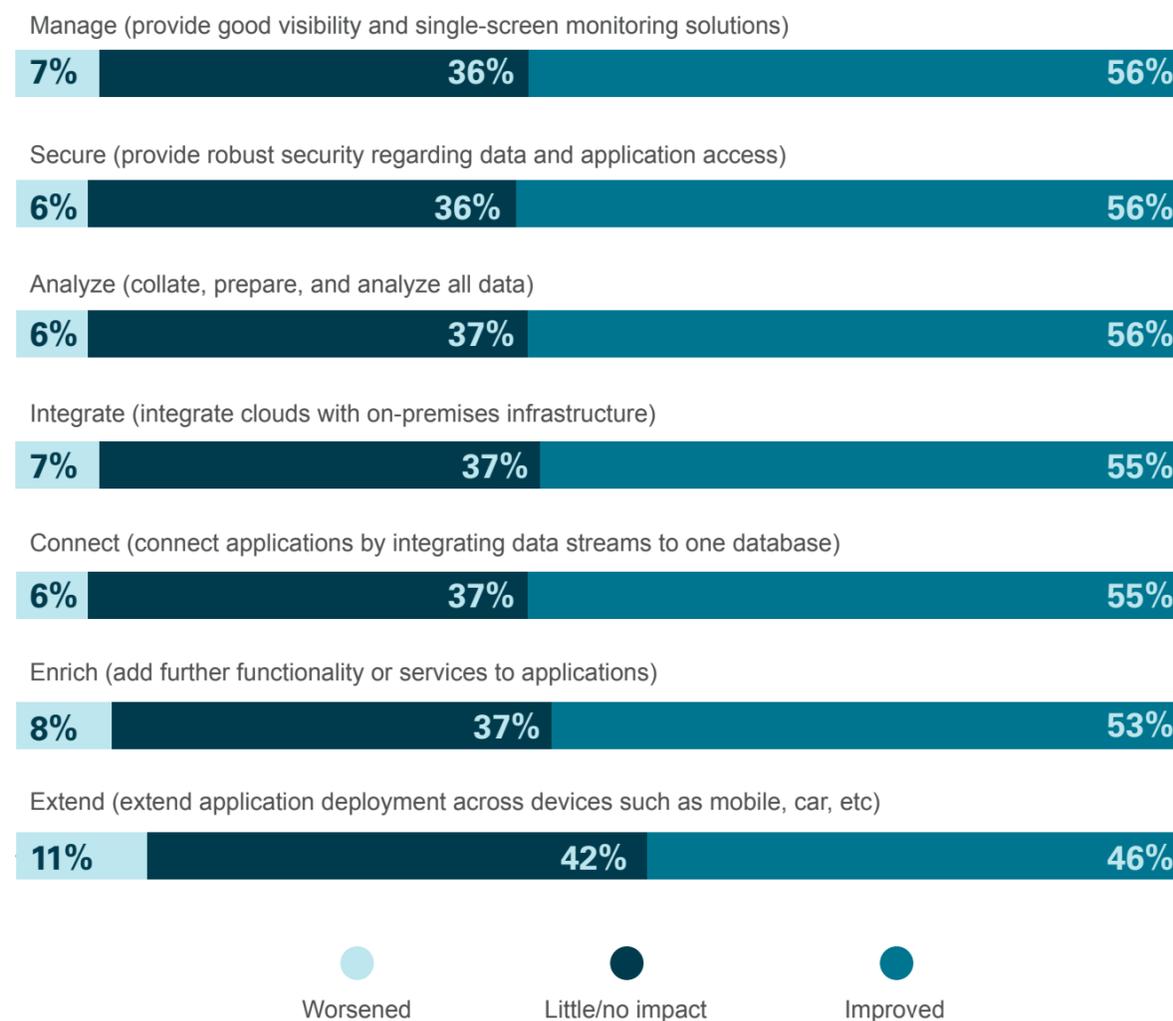


# Connect and Extend Applications

This is the stage of the cloud process in which organizations seek to integrate their applications, processes, data, APIs, and so on, across platforms. Integration is now a fundamental part of IT management for the majority of companies that run applications in multiple environments. Once a laborious process for developers and managers, the task has been made easier by advanced Platform as a Service (PaaS) solutions.

Cost, simplification, responsiveness, and connectivity dominate companies' integration agendas. Integration priorities vary, however. Reducing costs is the chief driver for those in the overall sample, but the cloud-mature organizations place a greater emphasis on performance. For example, the ability to respond more quickly to business requests is more often a priority for the cloud-mature companies (particularly those in insurance, and oil and gas), as is connecting SaaS with on-premises applications. For those in fast-moving industries such as consumer packaged goods (CPG), the ability to future-proof applications is a key motivator for integration.

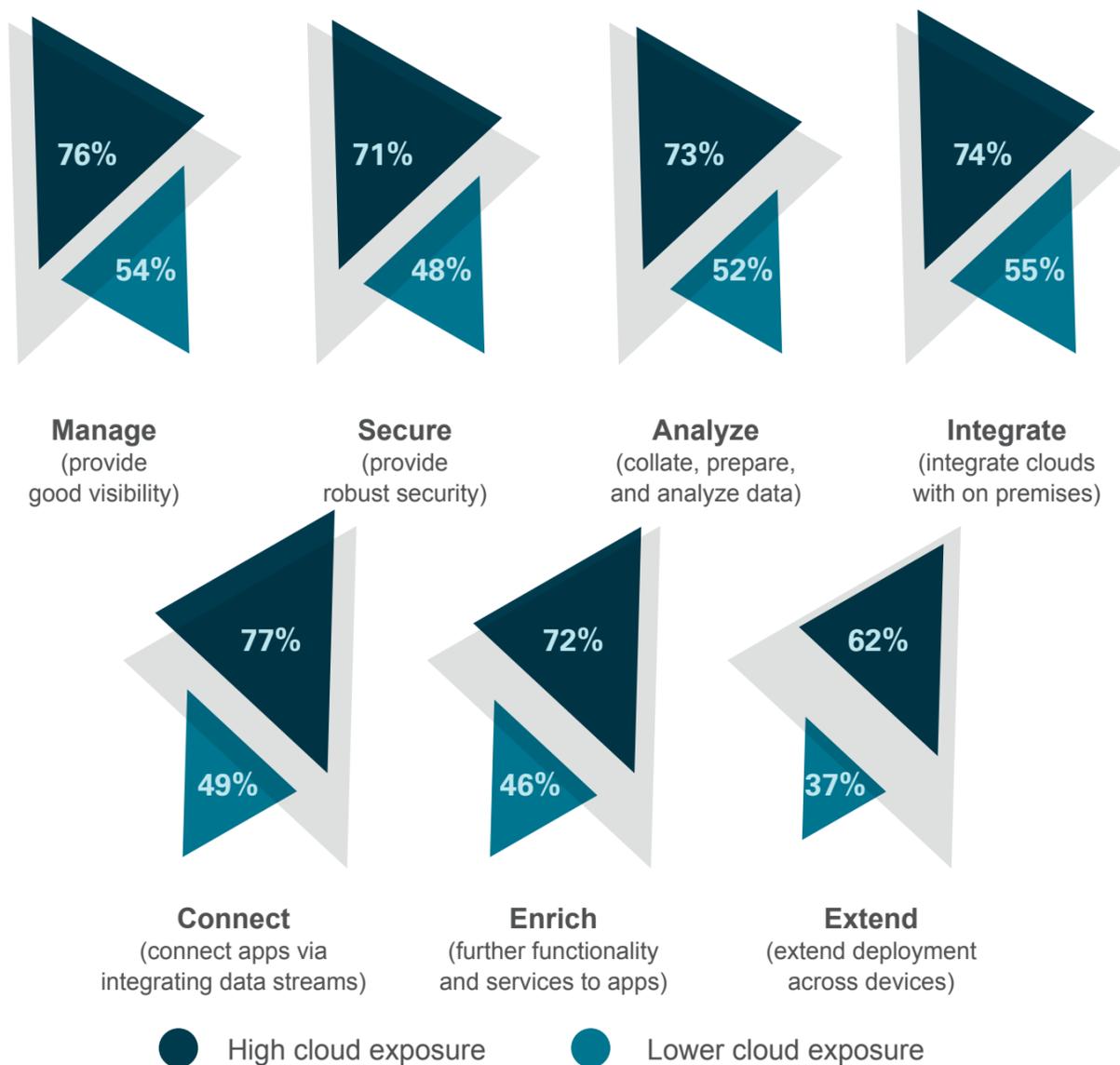
## Cloud integration impact (total).



**Figure 16:** Please rate the extent to which you think using PaaS will impact/has impacted your application development in each of the following areas. Respondents selected their answer on a seven-point scale.



## PaaS impact on App Dev (cloud exposure).



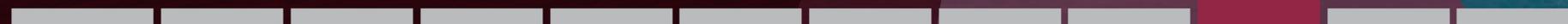
PaaS adoption is having a broadly positive impact on those surveyed in several ways. More than half of firms say they've seen improvements in their ability to integrate cloud and on-premises applications, connect applications through the integrated data streams, and add functionality and services to applications.

In the move to cloud, platform integration brings challenges. Foremost among these for cloud-mature companies are concerns about losing application features.

**Figure 17:** Please rate the extent to which you think using PaaS will impact/ has impacted your application development in each of the following areas. Chart shows improvement. Respondents selected their answer on a seven-point scale.



# Gain Insights for Business Transformation



# Gain Insights for Business Transformation

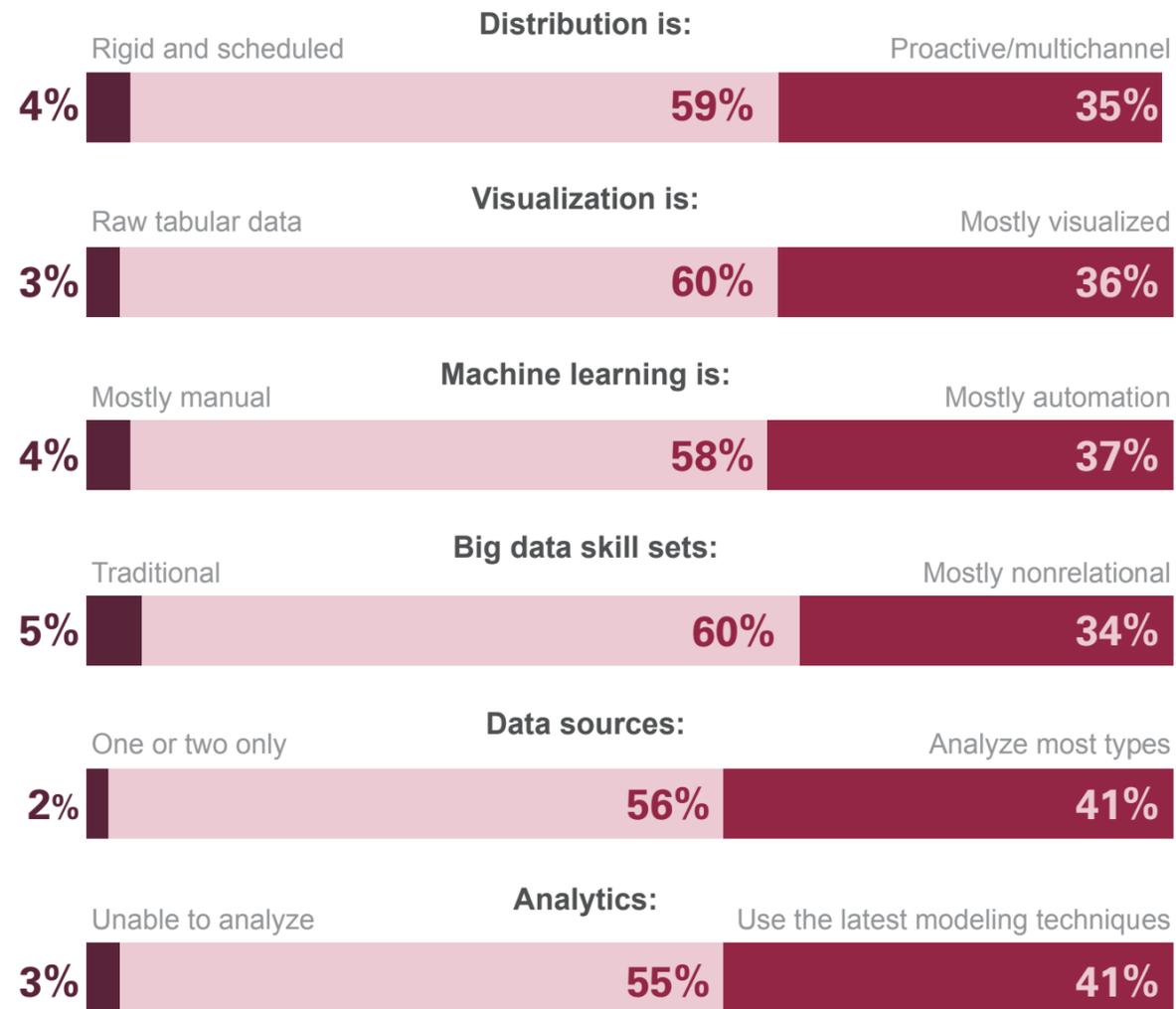
Transformation is possible when the cloud enables companies to ask any question of any data-set, anticipate outcomes to scenarios using predictive modeling, and visualize business performance across every level of the organization. After all, it's data's ability to produce insights that's underpinned some of the most innovative new business models of the past decade.

This is where the cloud-mature companies appear to enjoy the greatest advantages. When it comes to ease of analysis, machine learning, visualization, and analytics distribution, they rate their capabilities as considerably stronger than other respondents.

More than half of these leaders say they analyze most data types (including unstructured), that their analysis is usually presented in visualized form, and that distribution of analytics results is multichannel. Half also point to strong capabilities with non-relational data.

Those able to integrate their breadth of analytic capability into a single cloud platform are best placed to benefit from predictive and prescriptive insights—not just information on how their business is performing, but also recommendations for reducing costs, and driving growth in the future.

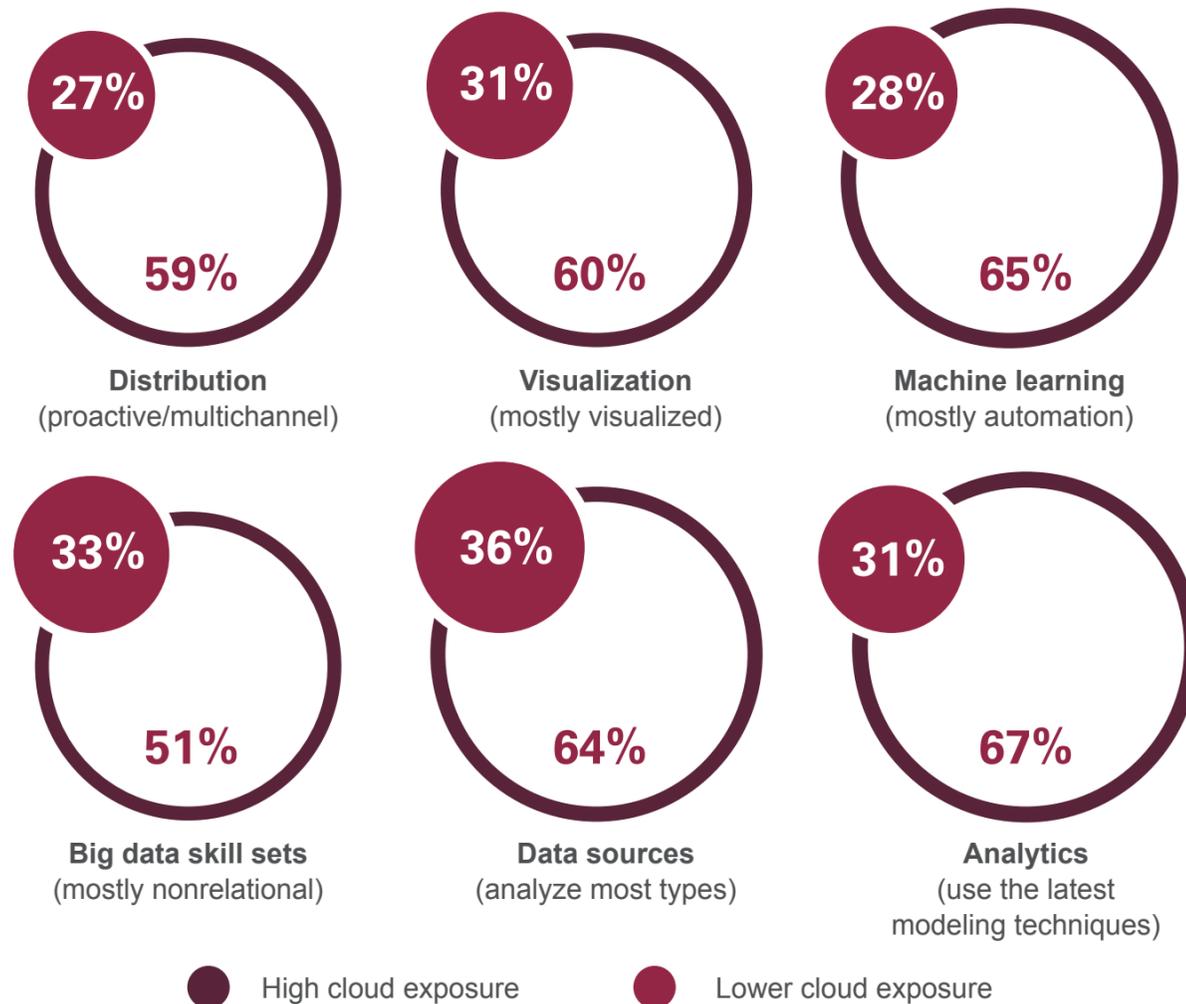
## Organization performance in analytics areas (total).



**Figure 18:** When it comes to data and analytics, how is your organization positioned on the following? Please select where your organization is positioned. Respondents selected their answer on a seven-point scale.



## Analytics capability (cloud exposure).



**Figure 19:** When it comes to data and analytics, how is your organization positioned on the following? Please select where your organization is positioned. Respondents selected their answer on a seven-point scale.

Intel understands data’s rich potential for organizations shifting to the cloud. “Just having those capabilities widely available and not having to operate within a completely fixed set of compute resources has enabled new analytics techniques to be applied, as well as deep-learning models, to the increasing volume of available data,” says Jeff Wittich. “The cloud has opened up possibilities that may never have gotten to the top of the list before.”

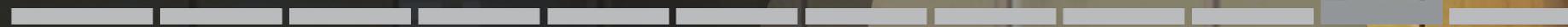
Gathering genuine insight is difficult, however, if data-sets are strewn with errors and siloed across operations, and with multiple tools in use. So it’s little surprise that, for some companies, the primary driver for analyzing data in the cloud is to improve its accuracy. Integration of data-sets is a key focus for others, including those across the technology, media, and telecommunications (TMT) sector.

Organizations’ other priorities include making analysis easier, gaining the ability to integrate all data sources, and achieving better visualization. The latter is a particular driver among insurance respondents, as they seek greater insights into their customers’ changing behavior.

These priorities are not going away: For many, analyzing diverse data-sets at scale remains difficult. However, the cloud makes it easier by allowing greater access to all data—regardless of its type or source—to more users, even from mobile devices.



# Modernize Security and Management



# Modernize Security and Management

Security and systems management are closely related. The same tools used to detect and deter attacks can also be used to monitor application performance.

Cloud services should provide monitoring and detailed analytics of applications across different environments, providing early warnings of breaches and outages, ensuring continuous compliance, and providing visibility of response times and alerts of deteriorating application performance. Machine learning can automate the way that security and systems management solutions predict problems and take measures to prevent them.

More than any other group, the cloud-mature companies are motivated by the need to improve the security of data when it's stored in the cloud.

Conforming to data protection rules is a particular challenge for Deutsche Telekom, says Michael Schlitt, VP of service and operations management at Deutsche Telekom IT: "As a company working out of Germany and obviously having a lot of German customers, we have to and want to adhere to the country's data protection and privacy laws. It means that we aren't able to bring every application into the public cloud."

A related challenge for companies operating in the EU (and any companies with EU customers) is compliance with GDPR, which came into force in May 2018.

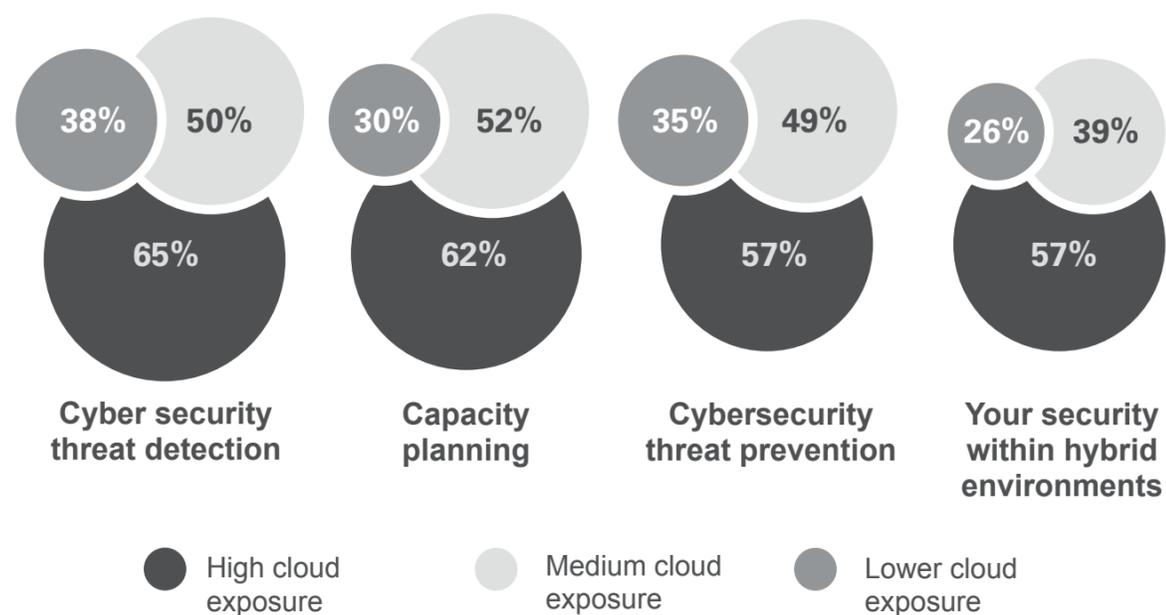
For Skanska, GDPR was significant. "We have to make sure that our data resides with the EU, which means we have to migrate some of it from US data centers," said Conny Björling. "That's so much easier when using cloud services with big vendors, because they usually have data centers here already, which makes it easy to migrate cloud solutions."

The majority of firms in the survey had yet to start taking measures to comply with GDPR. Only 14 percent were GDPR-compliant, with 20 percent in the implementation phase. Even among cloud-mature companies, only 34 percent were compliant. This is perhaps no surprise: Many organizations are moving to continuous rather than one-off compliance. And it's here that data discovery and classification are critical.

Cybersecurity concerns are, of course, widespread. Not only are the frequency and impact of cyberattacks perceived to be increasing, but application and infrastructure outages are also considered to be on the rise.



## Company ratings of security and management (those rating their organizations as good/very good).



Yet contrary to the popular perception that security vulnerabilities are greater in the cloud, cloud-mature companies are more confident in their security capabilities (see Figure 20).

Access to the latest tools and technologies improves the ability of these organizations to be proactive—to predict alerts, spot anomalies, and look for new types of breaches before they happen, as well as provide automated response and remediation. They’re also better equipped to manage and reduce the risk of using new technologies by optimizing performance and proactive planning. Securing these tools and technologies before cyber criminals can use them for their own ends is also a key enabler.

**Figure 20:** When it comes to security and management, how would you characterize your organization in terms of...? (Percentage rating their organization as good/very good.)



“Why do people think they’re more secure running their own platforms internally than going to a cloud vendor?” asks Björling. “If the vendor is treating the service in the right way, it’s probably more secure than running it internally in your own data center.”

The vendor is often best placed to provide a better holistic assessment and evaluation of the environment and how it should be optimized and secured across the board, both in the cloud and on premises. Consultant James Stewart points out that moving platform and application management to the cloud can enhance control rather than detract from it. “A lot of people think, ‘If we move to the cloud, it’s all out of our control.’ Actually, you can focus on the right areas to control. You have to cut through the mythology.”

This is where the partnership between customer and vendor is critical: The latter’s ability to provide people, technology, and physical data centers gives the organization confidence that any threats will be dealt with, and that response times will be reduced.

“Why do people think they’re more secure running their own platforms internally than going to a cloud vendor? If the vendor is treating the service in the right way, it’s probably more secure than running it internally in your own data center.”

Conny Björling  
Head of Enterprise Architecture  
Skanska



# Summary



# Summary

## **Faster innovation, better business: Cloud is the future-enabler.**

Resistance to the cloud is fading as it becomes clear that the advantages far outweigh the challenges. Companies are taking different paths and adopting different strategies, but they're all drawn by the promise of lower costs, greater topline growth, and easier access to innovation.

Cloud's business value comes in many forms: From reducing risk by monitoring and preventing threats to building new ways to manage and manipulate data.

But even greater opportunities lie ahead. The proliferation of data generated by IoT technologies, the power of predictive analytics to derive insights, and the ability of AI-based software to take automation to new levels—all these technologies point toward a move to the cloud.

## **Deeper insights.**

Companies with greater experience in the cloud report marked improvements since beginning their journey—namely application speed and responsiveness, the ability to experiment and gather insights from data, and measurable IT performance. These advantages are simply not on offer to organizations that manage most or all of their IT on premises.

Neither are the bigger gains—such as increased innovation and competitiveness—that are experienced by cloud-mature organizations.

Businesses that have integrated their full range of analytic capability into a single cloud platform demonstrate what is possible. These organizations benefit from acting on predictive intelligence, not just passive insights.

## **Strengthened security and management.**

The results of the survey also show that security isn't weakened by cloud adoption. Instead, companies that have made the most progress are more confident in the security of their data and systems than slower adopters. They believe that the safest place for their data isn't in their own data centers, but in the cloud; they're finding that their move to the cloud has enhanced, rather than weakened, their visibility and control across the entire technology landscape.

These businesses say that new adaptive security tools are enabling them to use machine learning to predict and detect threats. In doing so, they can move from a preventative stance to one of proactive, intuitive response.



## Integrated systems.

Few companies are in a position to fully retire their on-premises estate. The survey shows how a well-thought-through cloud implementation strategy can mitigate much of the drag on IT performance caused by on-premises management of data, applications, and infrastructure. Near-seamless integration across platforms and different IT environments, however, is a realistic expectation. Faced with a variety of tools and systems (and often different providers), businesses are looking for a common platform that smooths the integration of cloud and on-premises applications, and standardizes the way they develop applications in the future.

## No barriers.

To maximize the benefit from emerging technologies, companies will need to ensure that their cloud strategy and providers take a long-term view. Even those whose use of the cloud is mature will need to ask how they can continue growing their user base while reducing the cost of growing it. This is likely to mean they continue to manage their applications and infrastructure in a hybrid environment. It may even involve bringing some applications or databases back on premises if they can be managed more cost-effectively that way.

Their cloud provider must be able to remove barriers and provide seamless visibility across diverse environments. This offers greater choice, flexibility, and openness—of software and standards. Once organizations can see and track everything on premises, and in the cloud, there will be few challenges they can't meet.

## A process of discovery.

The results of this research provide compelling evidence of the cloud's benefits. Companies report greater levels of innovation and the ability to meet customers' needs more effectively. But the complexity of implementation, with myriad cloud services and systems, means leaders need to choose the path that best fits their business ambitions.

As the research shows, the entry points to the cloud are many. Organizations can choose to take incremental steps, considering what needs to happen and what they'll need from their provider in each phase. Whether it's in-depth security or faster app development, cloud can provide the answers; it's up to businesses to keep asking the right questions.

For further information,  
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