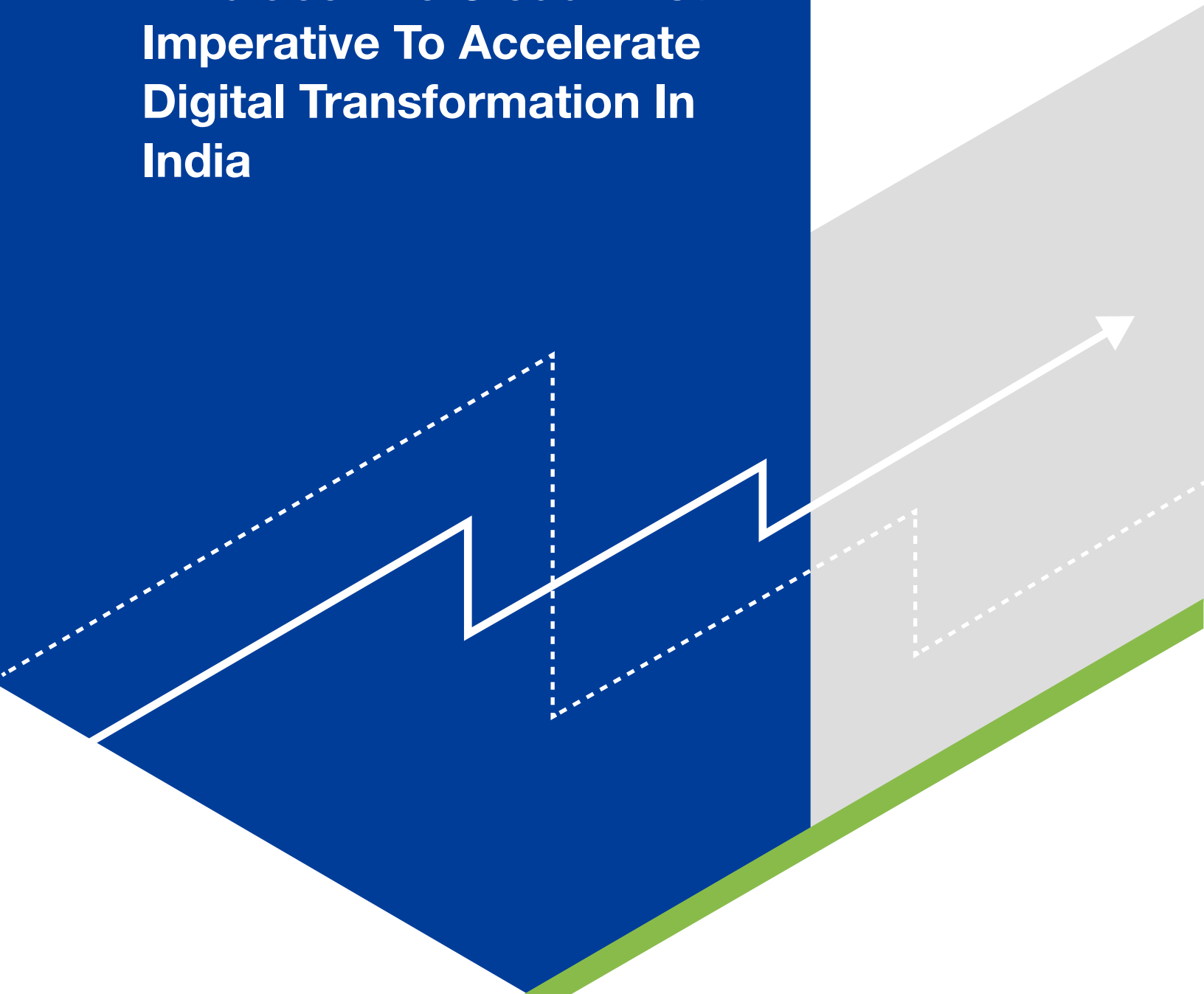
A Forrester Consulting
Thought Leadership Paper
Commissioned By Google Cloud

July 2019

Embrace The Cloud-First Imperative To Accelerate Digital Transformation In India



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By the end of 2020, nine in 10 firms will have some level of public cloud deployment.

Over the next two years, 73% of respondents expect to increase the number of secure or compliance-sensitive workloads in the cloud.

Executive Summary

India today is at the precipice of the oncoming wave of digital transformation. This wave will sweep through businesses and firms and boost technology adoption among the country's customers. Rapid digitization of the economy and the rising number of digital customers continue to fuel the digital transformation agenda for every business, irrespective of scale, size, or industry.

To respond to the needs of digital customers, organizations must transform into digital businesses, i.e., they must become increasingly agile, responsive, and efficient. Forward-thinking enterprises are increasingly turning to cloud to support their business as they attempt to keep pace with evolving customer needs. **Cloud has become a strategic priority, and ensuring its support in the marketplace will only enable digital business and accelerate innovation.**

In March 2019, Google Cloud commissioned Forrester Consulting to evaluate public cloud adoption trends in India, including the perceived challenges, drivers, and benefits of cloud investments. Forrester conducted an online survey with 360 business and technology decision makers from enterprises with 1,000 or more employees. Survey respondents are from banking/financial services/insurance, healthcare/life sciences, IT/IT-enabled services, manufacturing, media/entertainment/gaming, and retail industries.

KEY FINDINGS

- **Public cloud is a key enabler for the transformation of digital business.** Indian businesses are focusing on cloud adoption to drive operational excellence and customer experience (CX). Forty-three percent of respondents consider the public cloud as a means of empowering greater connectivity for digital transformation. In fact, over half of respondents believe that the public cloud enables digital customer experiences, which is an essential need in the age of the customer.
- **Security, inconsistent monitoring tools, and legacy applications are top barriers to public cloud expansion.** Success hinges on overcoming legacy and security challenges. Firms face internal challenges with executing their vision for more robust cloud capabilities. Nearly half of respondents worry that their staff are not equipped to manage cloud expansion. They also worry about the lack of consistent monitoring tools across cloud platforms to ensure that performance does not suffer.
- **Enterprises are expanding their adoption of the public cloud and want to gain a competitive edge.** For many organizations, cloud is becoming a top strategic priority, and more workloads are shifting to cloud every year. Over the next two years, 69% of respondents expect to migrate more core traditional business applications to cloud platforms.

Public Cloud Platforms Are Central To Digital Transformation in India

Digital transformation is rewriting the rules of business both in India and worldwide. Digital customer experiences deliver easy, effective, and emotional touchpoints that focus operations on what the customers value. Around half of Indian decision makers prioritize the improvement of CX and the simplification of operations, and subsequently of the organization, as top priorities in their business agenda.

Cloud platforms have become the foundation of the new digital business model. Cloud success isn't measured on cost efficiency or even business agility but rather the speed of business transformation. **Cloud is more than just a technology transformation driver — it's a business transformation accelerator.**[1] Successful organizations are using the cloud to connect employees, partners, and customers, while jointly leveraging cloud-native technologies, automation, analytics, and internet-of-things (IoT) touchpoints in real time.

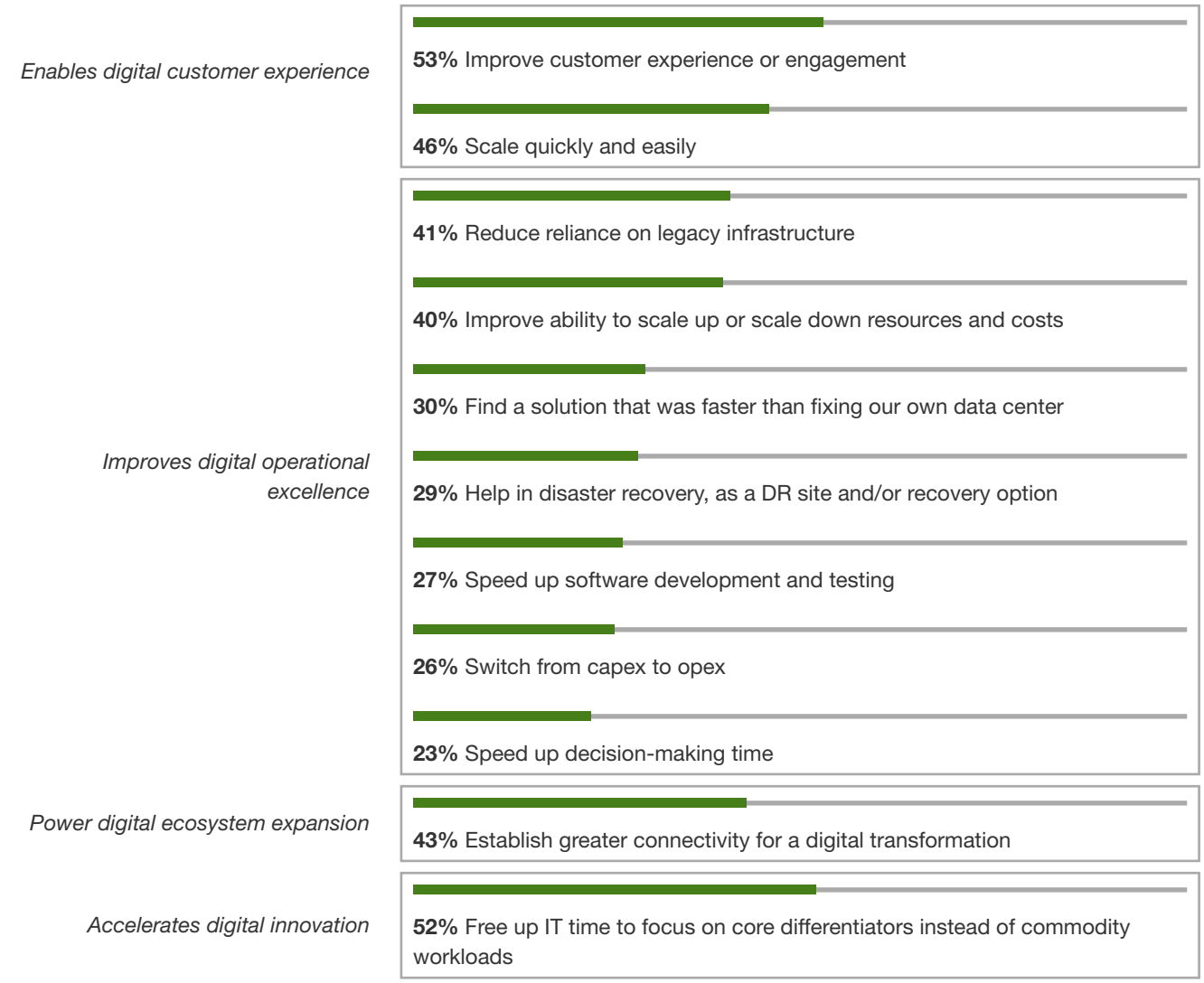
Public cloud is undoubtedly established as part of the enterprise's integral strategy, and adoption only continues to grow. More and more organizations are moving applications to the cloud in order to take advantage of scalability, lower capital costs, ease of operations, and the resilience offered by the public cloud. Results from the study show that the public cloud:

› **Enables essential digital customer experiences.** As businesses try to meet the accelerating needs of customers, more and more organizations are turning to the public cloud to provide the agility and flexibility needed to be successful. For example, enterprises use container-as-a-service (CaaS) and function-as-a-service (FaaS) to create efficient and highly scalable technology foundations to support dynamic workloads in real time with consistent performance. They leverage mobile and IoT services to launch system-of-engagement applications and improve experiences for always-connected, technology-empowered customers. Machine learning (ML) and AI services uncover customer insights and can help personalize the customer lifecycle. Over half of business and technology decision makers (53%) consider the improved customer experience as a key driver, while seeking application migration to the cloud. Faster and easy scalability (46%) was another important aspiration indicated by respondents for embracing the public cloud (see Figure 1).

One in two respondents consider improving CX as their top business priority.

Figure 1

"Which of the following business and IT objectives were important in considering migrating applications to the public cloud?" (Select top five)



Base: 360 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from organizations with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

› **Improves digital operational excellence.** The public cloud is pushing the pedal to meet business and IT objectives. Firms are optimistic about the impact their cloud strategies' have on performance, operational efficiency, and cost savings. Indian firms can streamline the development and operation of applications with public cloud services in the infrastructure and middleware layers. Development services GUIs allow developers to start implementing innovative ideas quickly; the configurability of infrastructure, development, and platform services streamlines provisioning processes to support changing demands. Flexible billing models and cost management features, such as pay-per-use and per-execution pricing, allow firms to cost-effectively validate ideas and accelerate go-to-market processes. Forty percent or more of respondents consider that the public cloud will reduce reliance on legacy infrastructure, improve organizations' ability to scale resources, and manage costs.

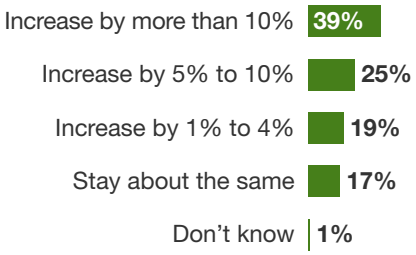
› **Drives digital ecosystem expansion.** Forty-three percent of respondents consider that the public cloud will set up greater connectivity for digital transformation. The public cloud is powering the rapid creation of new customer-facing services, software, and digitized processes that allow organizations to deliver on customers' demands by removing the "heavy lifting" and upfront investment needed with traditional infrastructure. It also facilitates value cocreation and business collaboration among marketplaces through the partner ecosystem.

› **Accelerates digital innovation.** More than half of respondents agree that the public cloud will free up IT time to focus on core differentiators, instead of on commodity workloads. Moving commodity workloads to the cloud increases the use of shared services and automation so that fewer people are required for repetitive operational tasks, thereby allowing organizations to both gain efficiencies and decrease deployment times. With the resulting availability of IT resources, to now work on innovation, strategic projects, and the execution of initiatives, organizations can be more agile and better react to business requests/changes. In addition, firms can also leverage big data, AI, IoT, and other emerging technologies to jump-start their innovative initiatives.

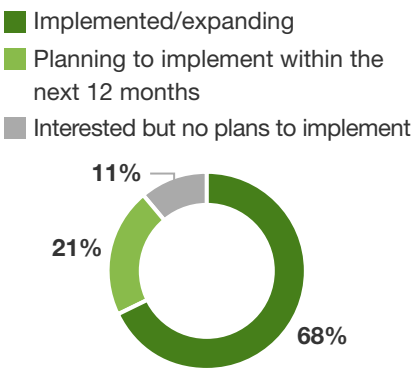
Regardless of their maturity, businesses across India are investing in cloud. Nearly, two-thirds of organizations plan to increase their cloud spending by 5% to 10% or more. Over half of surveyed respondents from each industry report that they have started their journey of public cloud adoption and more applications will move to the public cloud in the future (see Figure 2).

Figure 2

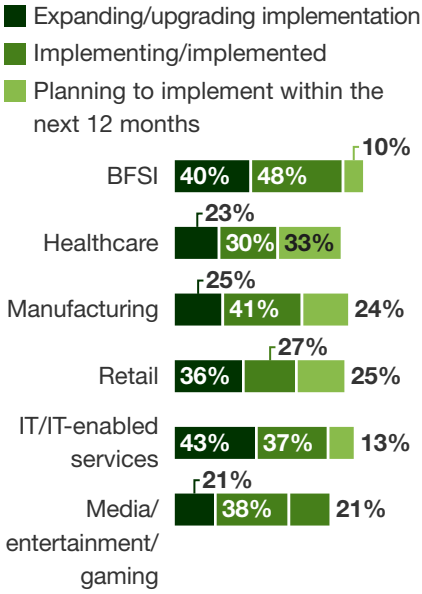
Cloud Investment In India On The Rise



State Of Public Cloud Adoption In India



Public Cloud Adoption By Industry
(Not showing all responses)



Base: 351 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from organizations with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

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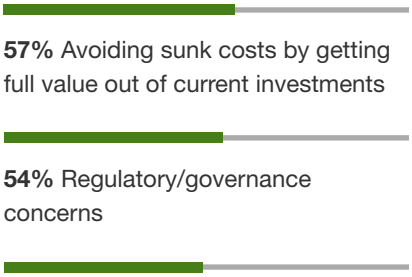
Business And Technology Decision Makers In India Are Facing Critical Challenges In Four Dimensions

Performance and scale are the top reasons businesses choose to move to the public cloud; they expect cloud to make them faster, more secure, more automated, and able to handle any spike in demand. Our survey results show that there is an improved perception around data security and data ownership — on a scale of 1 to 10, with 10 being the highest, the deterrent to using the public cloud has dropped from over 7, from two years ago, down to being less than 5.5, currently. While barriers to cloud adoption are steadily falling, challenges do still exist.

- **Security concerns and legacy complexity are slowing cloud adoption.** On one hand, these factors are challenging Indian firms that are already on the cloud. Fifty-eight percent of respondents cited concerns with security/privacy; followed by inconsistent monitoring or management tools across the cloud platform (54%) and the complexity of legacy applications slowing cloud migration (54%) (see Figure 3). As business and technology leaders look to expand their cloud usage over the next few years, they must ensure that their cloud infrastructures are secure, reliable and consistent. On the other hand, organizations that're still not engaging in the public cloud also share similar concerns — 57% are worrying about the current investments in legacy systems; 54% cited security/governance issues and 49% said that their organizations' legacy applications lack the capability to migrate to the public cloud (see Figure 4).
- **Rapid evolution of emerging technology is hindering cloud modernization.** Investment in emerging technologies has become a top priority for business decision makers to accelerate innovation worldwide. However, each emerging technology has complex technical architecture and is evolving fast, which makes it very difficult for digital practitioners to do everything from scratch all by themselves, such as manually establishing development environments, installing open source frameworks, and implementing machine learning models. Forty-one percent of respondents highlighted that without the right services and capabilities, the evolution of modern technologies such as cloud-native technologies, big data, analytics, ML/AI, etc., has hampered cloud modernization.
- **Limited DevOps experience is impacting customer value delivery.** The fundamental aspect of DevOps is trusting the team to work together, driving organizational outcomes and value. DevOps in the cloud requires broad coverage from a technology perspective, such as: the capability to automatically create and tear down environments on demand; a robust global network to deliver fast, consistent, and scalable performance for team collaboration; as well as comprehensive toolchains ranging from configuration management, container orchestration, to continuous integration/continuous delivery (CI/CD) and operations management. Without the right capabilities in these areas to cover the needs for speed and agility, it's very difficult to accelerate customer value delivery — 39% of decision makers in India are facing this challenge.

Figure 4

"Public cloud technology has been around for several years now. Why has your company chosen not to engage in public cloud adoption until now?" (Showing top three responses)



Base: 37 business and technology decision makers/influencers who are responsible for cloud adoption and strategy from organizations with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

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› **The necessity of hybrid cloud environments is challenging cloud operations.** Demand for hybrid cloud management has become the norm in the global cloud market — and this includes India. Three dimensions of hybrid cloud management complexity are challenging tech leaders: 1) deployment model complexity from private to public clouds; 2) the technology stack complexity between platforms from API; and 3) service configurations to functionalities on information-as-a-service, platform-as-a-service, software-as-a-service, and operations layers, as well as integration complexity among different legacy and emerging technology stacks. Managing these complexities without the right capabilities require significant efforts. As a result, over half of decision makers in India are worried about managing their hybrid cloud environments.

Survey results show that only one-third of firms have fully adopted cloud computing as part of their core IT philosophy. This indicates that much of cloud adoption to date has been in silos; given that many enterprises have made cloud decisions in siloes without an eye to broader business goals, organizations are still dwelling with legacy inertia and critical challenges. Business and technology leaders must check and balance low-friction business adoption of cloud services with the right level of governance over cloud usage within enterprises.

The good news? Decision makers know what they need from cloud service providers to expand their use of public cloud solutions. The top three aspects cited by respondents are: better migration support (65%); improved governance (58%); and elimination of data security risk (51%).

Figure 3

"What challenges does your organization face in adoption and/or expanding public cloud platforms?"
(Select all that apply)

Base: 360 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from organizations with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

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Take A Cloud-First Approach To Power Digital Transformation In India

The move to cloud is in full swing in India. More than two-thirds of respondents (69%) plan to migrate more core business applications to cloud platforms in the next two years. Forty-one percent plan to build more new applications in the cloud as well. Cloud is quickly becoming the preferred place to host existing business-critical apps as well.

By the end of 2020, nearly all companies planning/using cloud will have a hybrid cloud deployment.

Whether they are early in the adoption cycle or seasoned cloud users, enterprises plan to use cloud platforms for new and expanded purposes. Key digital imperatives including big data, microservices, containers, and IoT are focus areas for businesses that are expanding their use of the cloud. Thirty-nine percent or more expect to increase their use of these technologies and workloads in the cloud. This speaks volumes to the success of early deployments and the potential of cloud platforms to enable business transformation and drive competitive advantage. The following are key highlights from our study.

› **Identify business scenarios to justify cloud investments.** Evaluating the important business scenarios is crucial to an effective cloud strategy. But despite the different industry types, there is a core set of capabilities that businesses value (see Figure 5). More specifically:

- **Disaster recovery and business continuity.** Without proper business continuity preparedness, repeated outages or large-scale disruptions are likely to: hurt customer experience and loyalty; erode company profits; and damage brand reputation, business opportunities, and future revenues. Cloud providers can provide robust and less expensive business continuity solutions than businesses can alone.
- **Internal systems such as HR, finance, and CRM.** Cloud solutions help organizations become more agile by offering manifold benefits, such as: low upfront costs, good usability, proven scalability, better flexibility, better collaboration, and faster time-to-value, compared with traditional on-premises applications.
- **Customer-facing digital engagement platforms, once deployed, connect digital and omnichannel experiences.** The common purpose of these business scenarios is to improve the customer experience. How can the public cloud help? Integrating disparate systems through the use of cloud services is often easier and lowers the barrier to entry compared with on-premises solutions. When integration is easier, organizations can provide quick information to customers. This in turn increases satisfaction and enhances the digital experience and omnichannel customer engagement.
- **Data and analytics systems.** Data is key to the digital transformation journey as it helps build a better picture of what customers want and how well businesses are delivering on their CX agenda. Technology deployed in the cloud can bring data together easily and seamlessly.

Figure 5

Top Three Business Scenarios For Adopting The Public Cloud By Industry

	BFSI	Healthcare	Manufacturing	Retail	IT/IT-enabled services	Media/ entertainment/ gaming
1	Customer-facing digital engagement platforms **(72%)**	Customer-facing digital engagement platforms **(58%)**	Internal systems such as HR, finance, and CRM **(67%)**	Internal systems such as HR, finance, and CRM **(68%)**	Customer service and support **(70%)**	Data and analytics systems **(58%)**
2	Internal systems such as HR, finance, and CRM **(57%)**	Digital platform to deploy connected digital experiences **(53%)**	Sales and marketing systems **(58%)**	Omnichannel commerce **(62%)**	Data and analytics systems **(67%)**	Internal systems such as HR, finance, and CRM **(50%)**
3	Data and analytics systems **(43%)**	Internal systems such as HR, finance, and CRM **(48%)**	Disaster recovery and business continuity **(53%)**	Disaster recovery and business continuity **(52%)**	Internal systems such as HR, finance, and CRM **(62%)**	Development of advanced, bandwidth-intensive, front-end applications **(47%)**

Base: 60 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from each industry with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google Cloud, July 2019

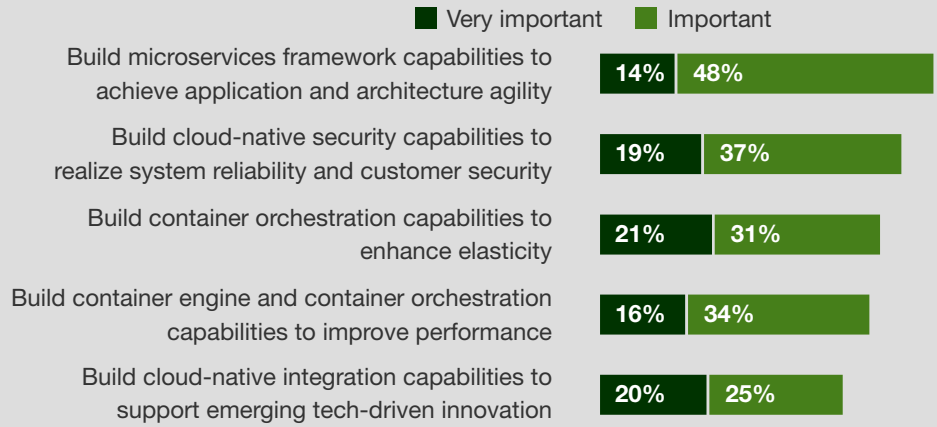
› **Leverage cloud-native technologies to modernize infrastructure and application architectures.** Cloud-native technologies, with containers and microservices at the core, speed deployment, reduce the infrastructure footprint, and improve infrastructure use. Those technologies also ensure consistency throughout the software development lifecycle to remove application delivery bottlenecks, providing a continuous deployment foundation for dev teams automating their software development and integration and helping companies achieve highly automated DevOps. In addition, cloud-native security features throughout the technology stack and lifecycle — from image scanning to runtime execution protection — will ensure system reliability and customer safety (see Figure 6).

› **Embrace open source frameworks to build foundation for tech-driven innovation.** Enterprises are seeing open source as a strategic choice and competitive advantage. Technology collaboration via open source communities is seen as a key value stream in helping firms expand digital ecosystems and cocreate value for the business. Over half of decision makers in India aspire to leverage open source for their cloud initiatives to support digital innovation —such as domain-specific AI frameworks like BERT for NLP to build cognitive applications, machine learning/deep learning frameworks like TensorFlow to extract customer and operations insights, as well as big data frameworks like Hadoop and Spark to turn massive amounts of complex data into valuable assets.

› **Focus on automation at scale to speed up value delivery.** The velocity of change and execution in the cloud is far beyond the capabilities of manual human intervention. Businesses seek automation not only to go faster, but to also be more secure and perform more trustworthy and continuous auditing. The importance of automation is well-reflected in the survey results, the top three responses are: multicloud cluster management automation (74%); CI/CD and release automation (74%); and container orchestration automation (69%). To accelerate the speed of value realization, enterprises must realign and focus on automation.

Figure 6

"How important do you consider the adoption of the following cloud-native technologies?"



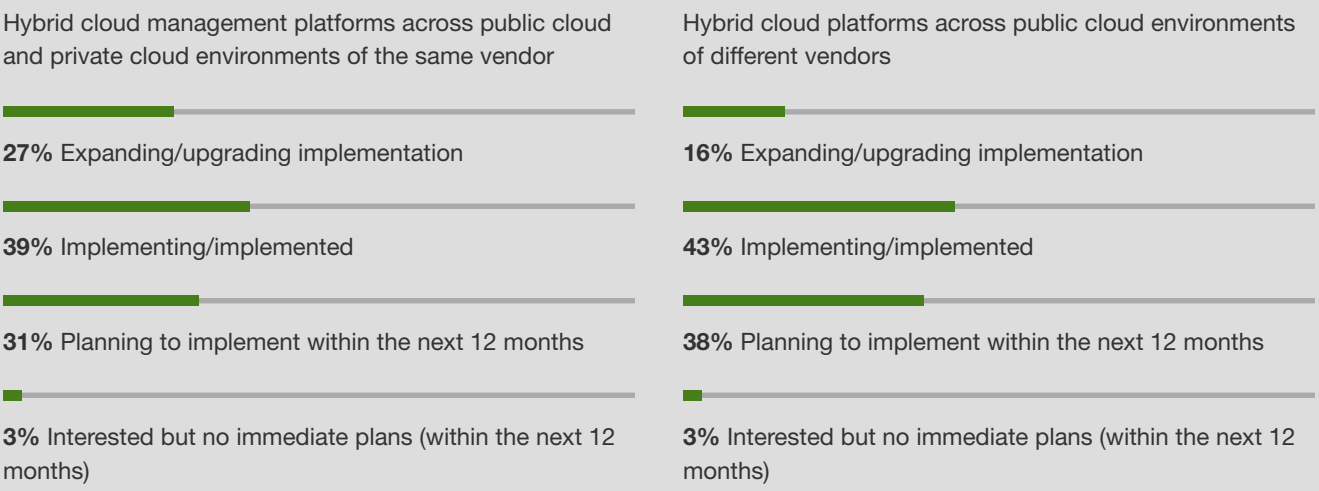
Base: 145 technology decision makers/influencers from large enterprises in India
Note: Not showing all responses. Showing percentage of respondents selecting "Very important" or "Important"
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

› **Prepare for hybrid cloud adoption to future proof your cloud future.** Different platforms are ideal for different workloads. Enterprises in India are embracing for hybrid cloud capabilities to increase flexibility, improve their manage ability, and find the right security/cost balance — two-thirds of enterprises have either adopted/are adopting or are expanding/upgrading implementation in hybrid cloud management platforms across public cloud and private cloud environments of the same vendor. Fifty-nine percent reported they have either adopted/are adopting or are expanding/upgrading implementation in hybrid cloud platforms across public cloud environments of different vendors (see Figure 7).

Therefore, taking the right approach is key to success. First, as preferred by more than quarter of respondents, having an API-consistent public and private cloud infrastructure is critical to reducing management complexity. Second, firms in India should strategically invest in hybrid cloud management capabilities, so as to enable multiple public and private cloud platforms for different application workloads. Our study results indicate that by the end of 2020, nearly all companies using cloud services will have adopted some form of the hybrid cloud model.

Figure 7

"What are your firm's plans to adopt the following platforms?" (Select one)



Base: 328 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from organizations with 1,000 or more employees.
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

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ORGANIZATIONS ARE SEEKING CLOUD SERVICE PROVIDERS THAT HAVE INDUSTRY EXPERTISE

Bearing in mind the intricacy of creating and executing cloud strategies, it's obvious that companies are looking to cloud service providers that can provide better expertise and support. Our study asked respondents to evaluate the important criteria they use to select their public cloud service providers. Top selections are vertical industry expertise (84%), customer support (80%), and service-level agreements (78%) — that include data center uptime/system performance. Other chosen criteria are apt product portfolios that fit business needs and existing internal capabilities to manage unique vendor platforms.

Key Recommendations

Technologically empowered customers, new digital business models, and the increasing pressure of competition in India are driving organizations to embrace the public cloud. Organizations that have embarked on the cloud journey should expect to drive operational excellence and improve CX, but organizations should continue to reassess their cloud strategy, execution, and fix gaps. Good is never good enough in the rapidly evolving world of cloud. To succeed, organizations must:

Review cloud strategy. Firms should recognize that getting key business applications into the cloud is only the first step. Cloud is an important element of digital transformation, but to get there, firms should periodically update cloud strategy and regularly audit workloads to test risks compared to the defined strategy. Put your cloud metrics into action to improve performance and business outcomes.

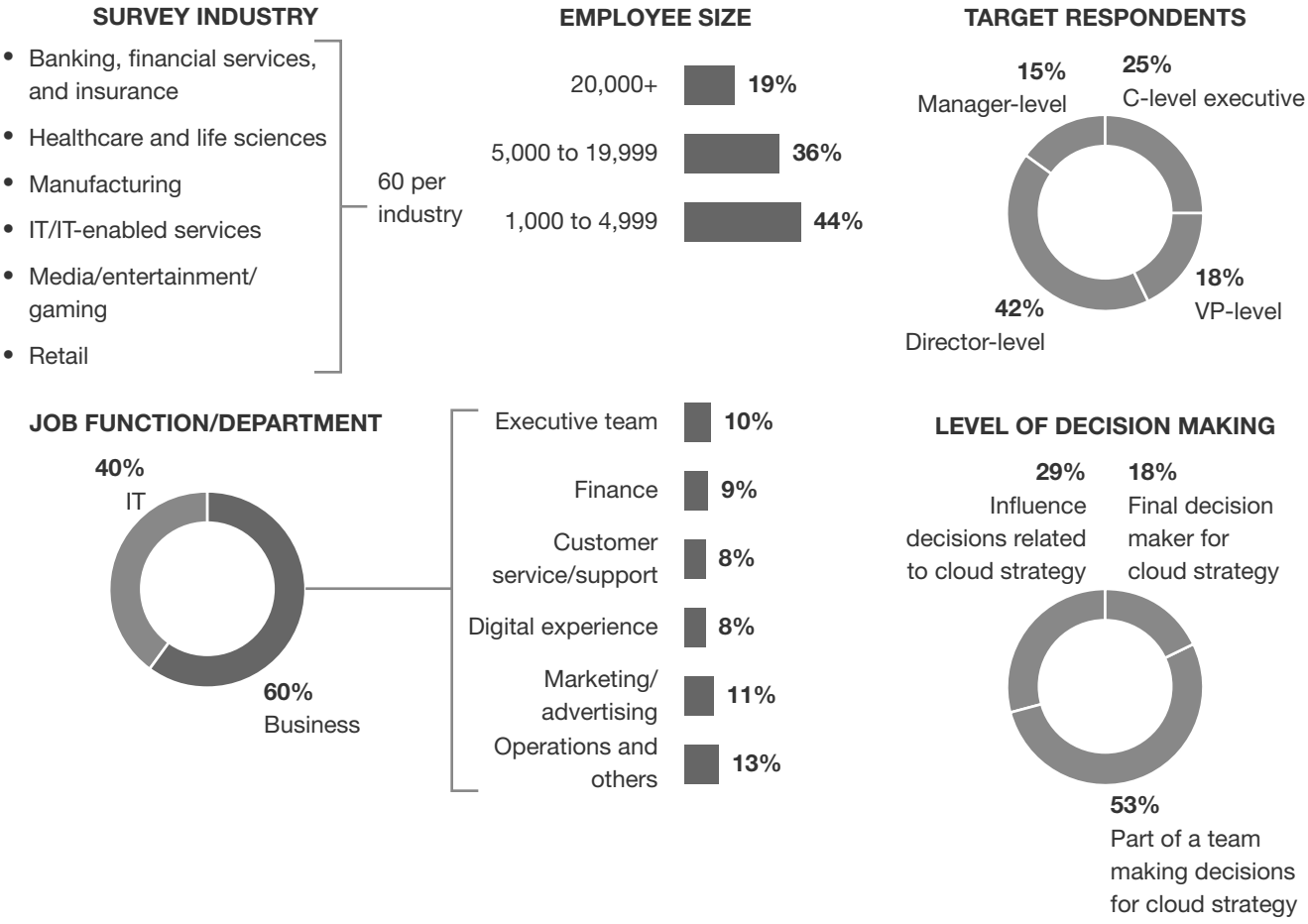
Expand usage of hybrid cloud offerings. For many companies, cloud infrastructure, platform, and application adoption have been piecemeal, with varying entry points led by different business units. It's time to rationalize the multicloud choices using emerging hybrid cloud solutions. Organizations should encourage evaluation and adoption of emerging hybrid cloud solutions that combine elements of public clouds and private clouds.

Choose and reengage with visionary and trusted cloud services providers. Given the pace of change and innovation across cloud platforms, most decision makers will need help crafting a strategic plan to satisfy multiple internal stakeholders and unify cloud app, data, and infrastructure modernization plans. Seek consulting and implementation services to evaluate app portfolios, to perform migrations, and to manage public cloud deployments.

Appendix A: Methodology

In this study, Forrester conducted an online survey of 360 respondents to explore the public cloud adoption trends in India. Survey participants included decision makers from business and technology functions from banking/financial services/insurance, healthcare/life sciences, IT/IT-enabled services, manufacturing, media/entertainment/gaming, and retail industries. Respondents were offered a small incentive as a token of appreciation and thank you for time spent on the survey. The study was completed in July 2019.

Appendix B: Demographics



Base: 360 business and technology decision makers/influencers who are responsible for cloud strategy and adoption from organizations with 1,000 or more employees
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, July 2019

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Appendix C: Supplemental Material

RELATED FORRESTER RESEARCH

"Refine Your Cloud Maturity Through Continual Assessment," Forrester Research, Inc., January 12, 2018.

"Take The Wheel: Build Your Cloud Computing Strategic Plan Now," Forrester Research, Inc., October 26, 2018.

"Now Tech: Enterprise Container Platforms In China, Q2 2019," Forrester Research, Inc., April 12, 2019.

"The Public Cloud Market Outlook, 2019 To 2022," Forrester Research, Inc., July 2, 2019.

Appendix D: Endnotes

[1] Source: "Cloud Powers The New Platform Economy," Forrester Research, Inc., October 12, 2018.