



# State of Enterprise Technology

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52 Key Contributors

**Research, Edit, and Analysis:**

**R. Giridhar**, Group Editor, B2B Tech, 9.9 Group

**Balaka Baruah Aggarwal**, Consulting Editor, CIO&Leader, 9.9 Group

**Jatinder Singh**, Executive Editor, CIO&Leader, 9.9 Group

**Nisha Sharma**, Principal Correspondent, CIO&Leader, 9.9 Group

**Design:**

**Baiju NV**, Associate Art Director

**Nikhil Wahal**, Senior UI UX Designer

**Vipin Rai**, Senior Designer

# Preface

In the ever-evolving landscape of Indian enterprise tech, the shift to digital has become a top priority. The impetus for this transformation gained momentum during the pandemic as businesses adapted to new ways of operating. In the post-disruption era, businesses are strategically adopting innovative tools and tech to enhance engagement, productivity, and customer satisfaction.

The CIO&Leader research report, 'State of Enterprise IT in India,' explores the enterprise technology landscape. With insights from over 300 IT decision-makers, it is a valuable barometer of the technology trends shaping Indian organizations.

From Cloud Infrastructure and Security to Data Analytics and Artificial Intelligence (AI), our research, conducted between July and September 2023, provides a 360-degree view of technology deployment, challenges, and future plans. A preview of the report was shared at the 24th CIO&Leader Annual Summit with India's top CIOs—and the complete analysis is now in your hands.

The study was led by R. Giridhar, Group Editor at 9.9 Group, and was ably helmed by our consulting editor, Balaka Baruah Aggarwal. It explores everything—from

the impact of AI to the enduring use of on-premise solutions, despite the clamour for the cloud. Key takeaways highlight a consensus on the importance of AI—but reveal a readiness gap. Cloud strategies continue to be impacted by security concerns and skill shortages.

More than just data, our report mirrors the dreams and challenges of Indian enterprises in the digital age. It aims to forecast the trajectory of Indian enterprise IT, drawing insights from top CIOs and CTOs of leading businesses.

Our thanks to all IT leaders who participated in this research study, patiently answering a series of surveys—and revealing their views, perceptions, and opinions. Your participation has contributed to the depth and richness of our conclusions.

We look forward to having your feedback on this study—and how we can make it more useful in the following editions.

Sincerely,

**Jatinder Singh**  
Executive Editor  
CIO&Leader



# Executive **Summary**

The State of Enterprise IT is a comprehensive report that presents dominant technology trends shaping Indian businesses. It is based on four online surveys conducted in July-Sep 2023 across 300 IT decision makers from diverse industries and company sizes. The surveys comprised Cloud Infrastructure, Security, Data and Analytics, and Artificial Intelligence (AI) in the enterprise.

Providing insights into the current landscape of enterprise IT in India, the report showcases prevailing trends, adoption patterns, challenges and drivers for specific technologies. Crucially, it provides insights into the decision making of technology choices in enterprises.

It sheds light on how organizations are leveraging cutting-edge technologies to drive innovation, enhance operational efficiency, and remain competitive. Specifically, the report provides insights into the adoption of Cloud solutions, state of security in organizations,

utilization of data and analytics and integration of AI to impact business outcomes.

By highlighting the key insights gathered from IT decision makers, the report offers actionable intelligence to businesses, technology providers, policymakers and other stakeholders. The insights will enable to better understand the current IT landscape, identify opportunities, and address challenges in adopting and implementing specific technologies.

The “State of Enterprise IT in India” report is designed to be a compass to navigate the rapidly changing IT landscape and leverage technology to its full potential. The valuable insights weaned from the minds that shape and steer IT strategies will help businesses make informed choices in the quest for technology-led transformational capabilities.

Below are the key highlights from each of the four reports



# Cloud and Infrastructure

Cloud adoption continues to surge, driven by digital transformation initiatives and the demand for innovation and enhanced customer experiences. Additionally, the imperative to leverage advanced technologies such as AI further fuels the momentum.

Businesses are reaping substantial benefits as Cloud deployments reach higher levels of maturity. This is evident in wide adoption of cloud-native architectures, containers and micro-services, implementing DevOps practices, and utilizing APIs to create value.

Overall, as-a-service model is maturing with adopters using a variety of services. SaaS is in an advanced stage of adoption.

ITDMs are wary about managing cloud security. Organizations need to adopt a comprehensive approach, combining robust security tools, well-defined policies, regular audits, and staff training to address the unique challenges.

Businesses are faced with performance issues and there is an urgent need to optimize application performance.





# Data & Analytics

Cold data is increasing at a faster rate for most organizations indicating an increasingly stringent regulatory environment and the need to store data for compliance.

There is a surge in the storage of video, even as storage of text data is growing at a similar pace.

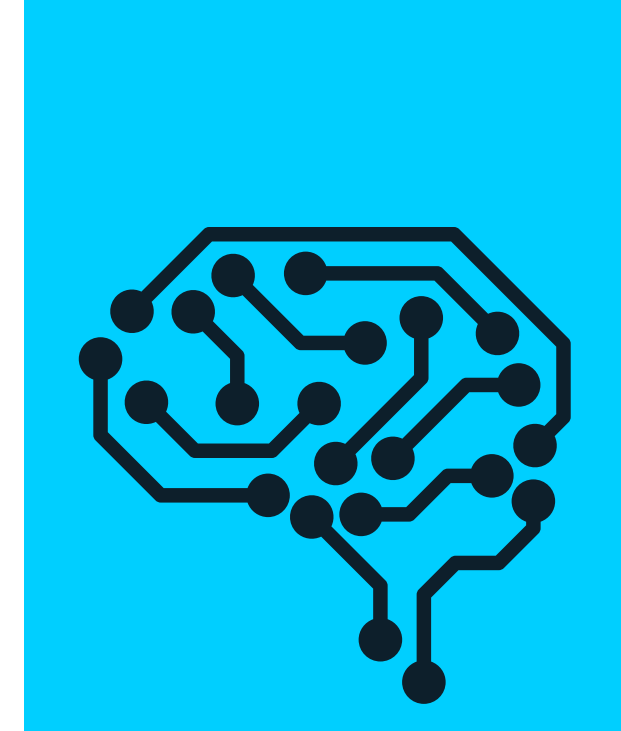
The foundations of a robust data strategy are well in place with a systematic approach in technology and architecture, adopting best practices such as DataOps and integrating

multiple data sources empowering businesses to leverage data to achieve differentiated business outcomes.

Businesses are embracing data integrity best practices such as data audits, data de-duplication and data capture controls and validation.

MIS reports and dashboards are widely adopted across departments and business functions, while advanced analytics is picking up.





# Artificial Intelligence in Enterprise

AI is increasingly being used as a catalyst for digital transformation to achieve competitive edge with enhanced customer experiences.

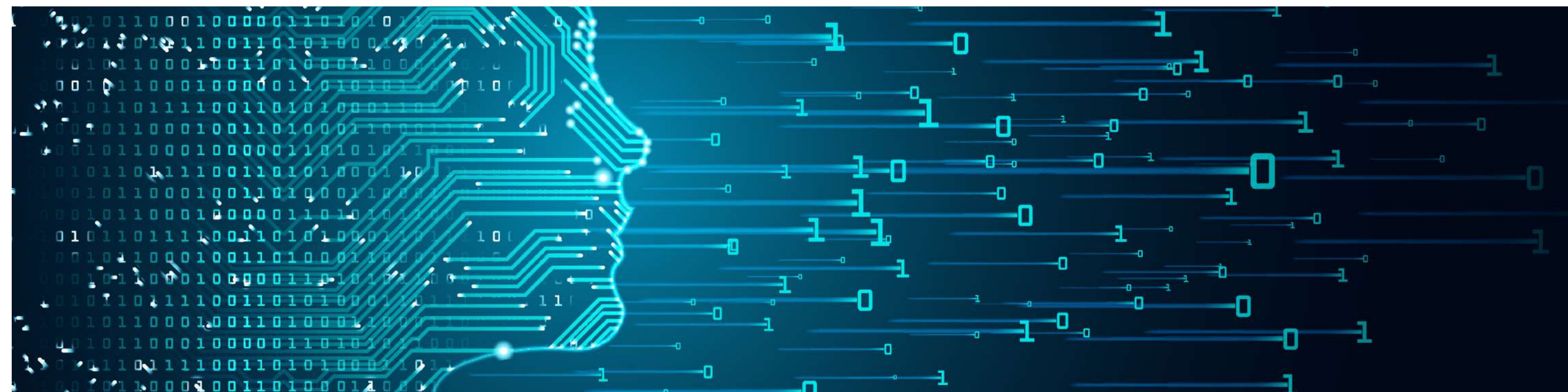
AI-led CX is empowering with disruptive capabilities to predict potential issues and identify patterns to pro-actively address concerns.

Early AI implementations in IT and supply chain management demonstrated its value proposition boosting adoption in core business applications. Now organizations are more confident that AI adoption can create impact

and using it for competitive advantage. Organizations are turning to AI to bolster cybersecurity and defend against AI orchestrated attacks; perform root-cause analysis and reduce the burden on analysts with automated cybersecurity operations.

Insufficient data can lead to inaccurate or biased AI models and AI initiatives are challenged to find high-quality datasets to train data models.

Cyber threats can derail AI deployments by manipulating input data to mislead AI models.





# Cyber Security

Phishing is the most severe form of security incident. Ransomware attacks are prevalent but not as rampant.

People continue to be the weakest link in cyber security. Social engineering is commonly employed to trick employees into clicking on malicious links, share confidential information and inadvertently allow access.

Lack of skills and understanding about Cloud technologies is causing human errors and

misconfiguration issues leading to inadvertent data breaches.

The rapidly evolving threat environment and the shortage of skilled professionals are serious impediments to robust cyber security.

Organizations are employing penetration testing to identify potential weakness and leaning on a combination of in-house teams and expert third-party security service providers to strengthen cyber security.







Cloud  
Adoption in  
India -  
**Onward and  
Upward !**



The State of Technology Survey by CIO&Leader finds the momentum in Cloud adoption remains unabated buoyed by digital transformation

initiatives, need to innovate and offer new customer experiences along with the imperative to harness advanced technologies like Artificial Intelligence. No respondent indicated plans to repatriate workload on-premise when asked specifically, in contrast to recent trends where workloads were being moved back to on-premise due to costs, security and compliance challenges.

Benefits are accruing due to high level of maturity in Cloud deployments wherein businesses are embracing Cloud-native architectures by using containers and micro-services; DevOps practices; exploiting APIs to create more value and enthusiastically pursuing emerging technologies like AI.

Some of the benefits that have propelled the Cloud adoption momentum include cost savings; higher business agility; cloud flexibility and scalability; higher application performance; and the ability to implement disaster recovery and business continuity with ease.

Overall, as-a-service is becoming increasingly

accepted and on the rise with 100% respondents using it in some form or the other. SaaS is in advanced stage of adoption with an overwhelming majority subscribing to some application, followed by infrastructure-as-a-service (IAAS), Application Platform as a service and Analytics as a service.

Workloads commonly deployed in the cloud include collaboration, e-commerce and web services. Industry specific and vertical solutions are largely on-prem or hosted in co-location centers indicating technical complexities arising out of application dependencies; security and compliance challenges and need to retain proprietary information in a secure environment. AIML workloads have shown significant uptake with more than a quarter of the respondents indicating high usage and a third of the respondents indicating moderate usage.

Despite the uptake of cloud services, an overwhelming majority of workloads are still on-premise or in co-lo with disaster recovery and business continuity topping the list. Few reasons stand out for this trend—the business need to protect existing investments; the imperative for BCP at a nearby location; and the fact the public cloud's pay-as-you go model becomes a huge cost proposition in the long term for DR and BCP.

## What Cloud Services India Inc is using?

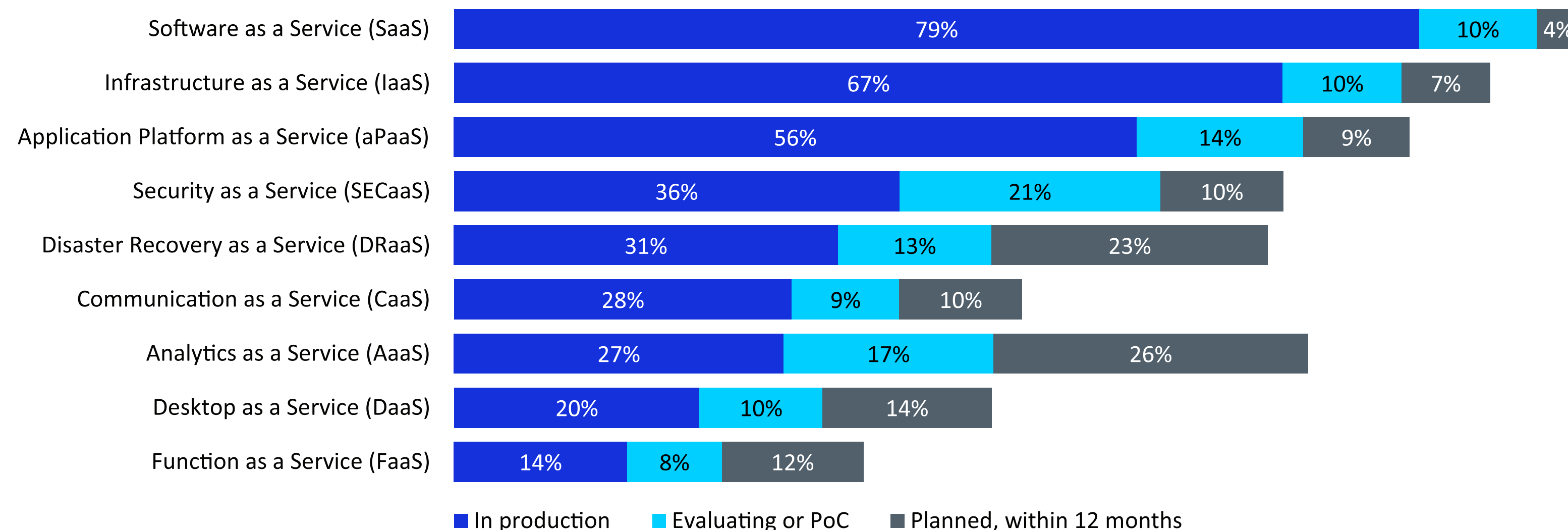
Indian businesses are using a wide variety of Cloud services from SaaS (79%) at the top end to Function-as-a-service (15%) at the other end. Infrastructure-as-a-service is widely adopted amongst 67% respondents with another 10% evaluating adoption with PoCs, clearly indicating that the promise of Cloud-native capabilities is luring Indian businesses to migrate workloads.

aPaaS is witnessing significant adoption in India amongst 56% of the respondents with 14% evaluating it via PoCs. This momentum can be attributed to the presence of mature platforms such as Salesforce, Microsoft SharePoint, Office

360, SAP Business Technology Platform, Zoho Creator and the proliferation of low-code-no-code platform providers such as ServiceNow, Automation Anywhere and Kissflow. Security-as-a-service (SECaaS) is popular at 36% which points to the need for comprehensive security solutions. In addition to getting full-featured security tools, SECaaS allows businesses to overcome the skill gaps with remote monitoring, incident management and remediation of security incidents.

Disaster Recovery-as-a-Service also picking amongst 31% of respondents with another 13% respondents evaluating it seeking to ensure business continuity in the event of an attack or natural disaster.

## What Cloud Services Are You Using?



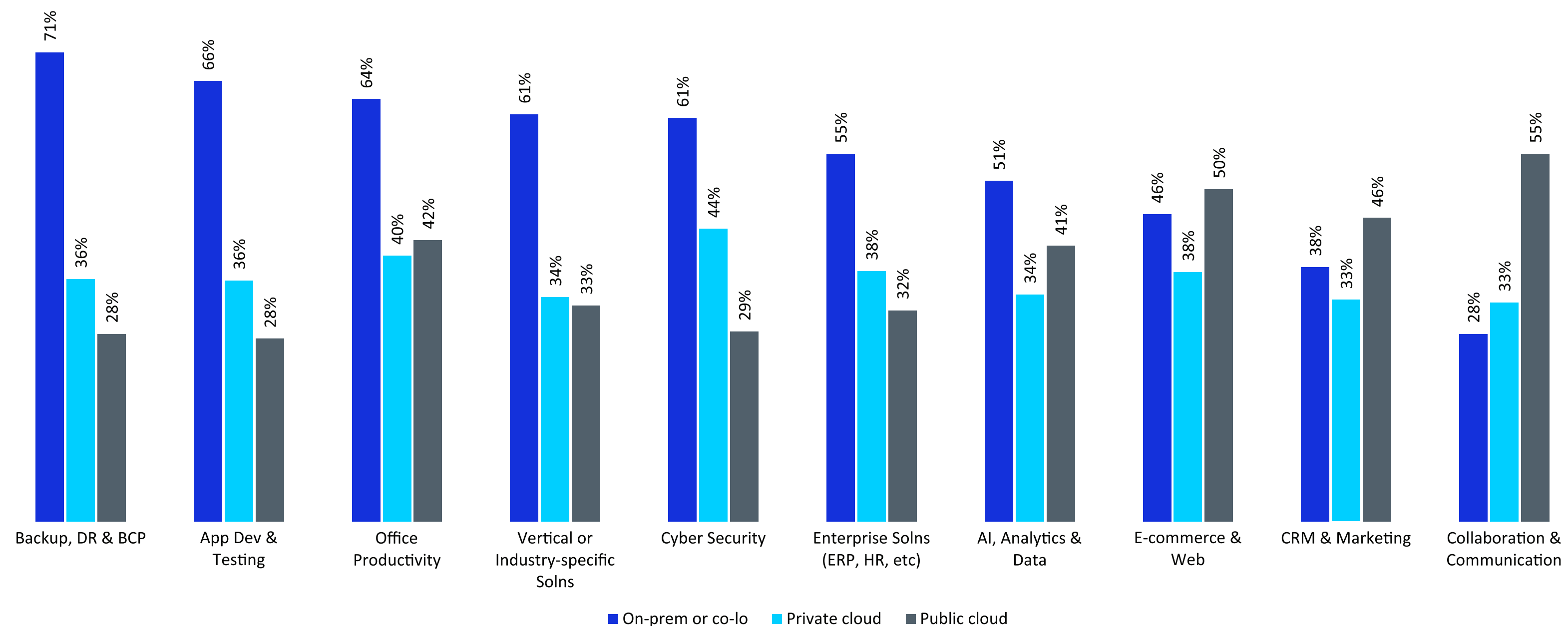
## Where are the Workloads Going?

Despite the cloud momentum, an overwhelming majority of workloads are still operating in traditional environments and in co-location. Public cloud is growing its appeal but private cloud is still winning. Many organizations are using public cloud periodically to access capacity and manage the surge in traffic during seasonal peaks. For instance, take enterprise applications (ERP, SCM, HR) 55% workloads are on-prem or in co-lo; 38% in private cloud and 32% in public cloud. Even for app development & testing, a function that is ideally suited for cloud environments, 66%

respondents are still doing it traditional environments while 36% use public cloud and 28% use public cloud.

Similarly, DR, back-up and BCP deployments ideally suited for public cloud (28%) are still picking up with a large number of initiatives already underway in traditional on-prem and co-lo environments (71%) and public (36%). Discerning Indian businesses understand the value proposition of cloud to handle unpredictability with the highest number of respondents opting to host e-commerce applications in the public cloud at 50%, followed by on-prem at 46%.

## Where are you hosting your enterprise IT applications?



## How Deep is the Cloud Engagement of Indian Businesses?

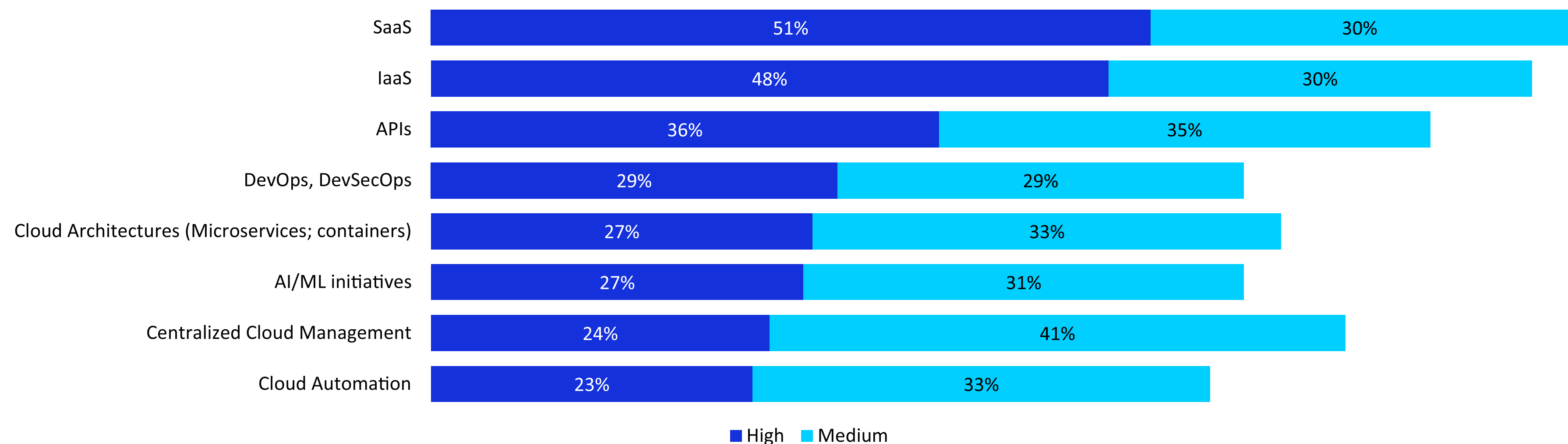
Cloud-native practices are picking up pace with a high to moderate usage of IaaS amongst adopters amongst 78%; Cloud architectures that includes micro-services and containers at 60% and DevOps and DevSecOps practices amongst 58% respondents.

Adopters are also embracing best practices in cloud management with 65% having a central management system and 56% using cloud automation at high to moderate level. Businesses want control and

visibility across environments not necessarily in cloud. Remember most of the workloads are still in traditional or co-lo and this comes out strongly in the responses where only 22% indicated low usage of central management while a relatively high 30% indicated low usage of cloud automation.

Use of APIs is high at 71% indicating deep integrations in deployments and AI/ML initiatives are gathering good momentum with 58%, indicating that businesses are taking advantage of platform-based approaches in emerging technologies.

### Use of Cloud Technologies in the Organization



## What Keeps IT Awake

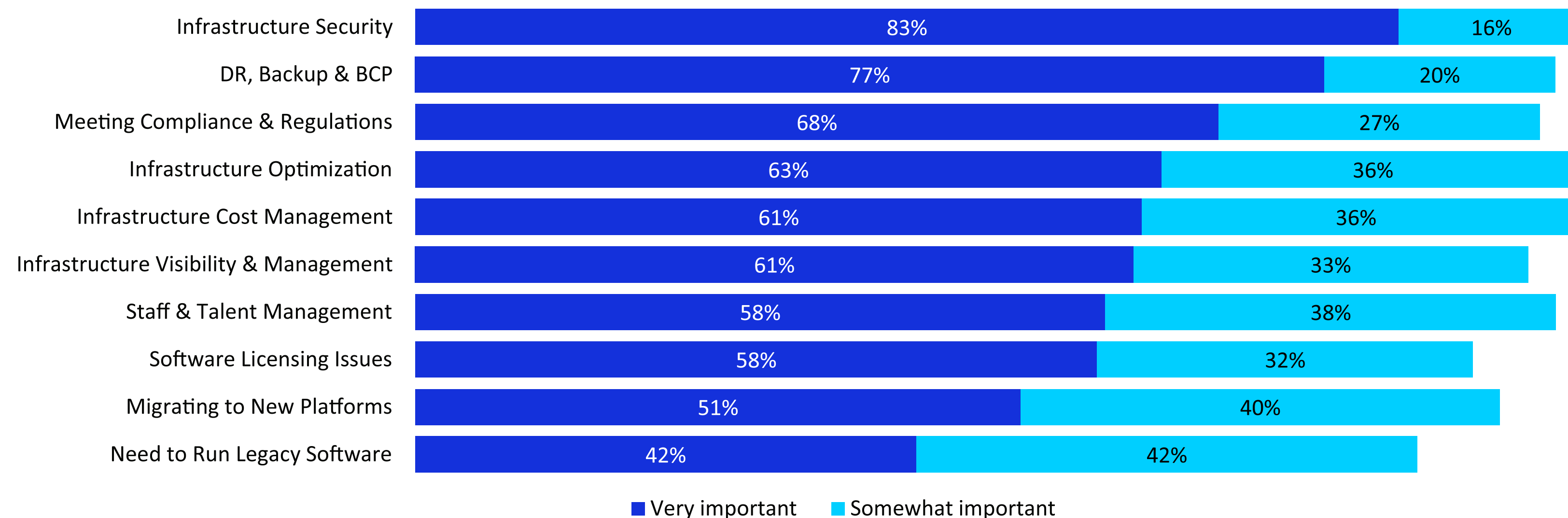
The responses to this question are not a surprise and are on expected lines with infrastructure security by far the most dominant concern amongst 83% respondents followed by disaster recovery, back up and business continuity amongst 77% respondents, followed by meeting compliance and regulatory at 69%. This is strong indication that keeping the lights on continues to be the major pre-occupation for the IT department.

Given the surge in number and sophistication of cyberattacks and the consequent cost of data breach

along with regulatory and compliance challenges, this is not surprising. India registered 18% increase in weekly cyberattacks in the first quarter of 2023 compared to same quarter in the previous year, according to CheckPoint. According to IBM's Cost of Data Breach report, the average total cost of data breach stands at Rs 176 million in 2022 representing a 6.6% increase over the previous year.

Next set of IT preoccupation clearly relates to cost with infrastructure optimization at 63%; cost management at 62% and infrastructure visibility and management at 72%.

## What are your main concerns about IT infrastructure?



## What Factors Are Driving Cloud Adoption?

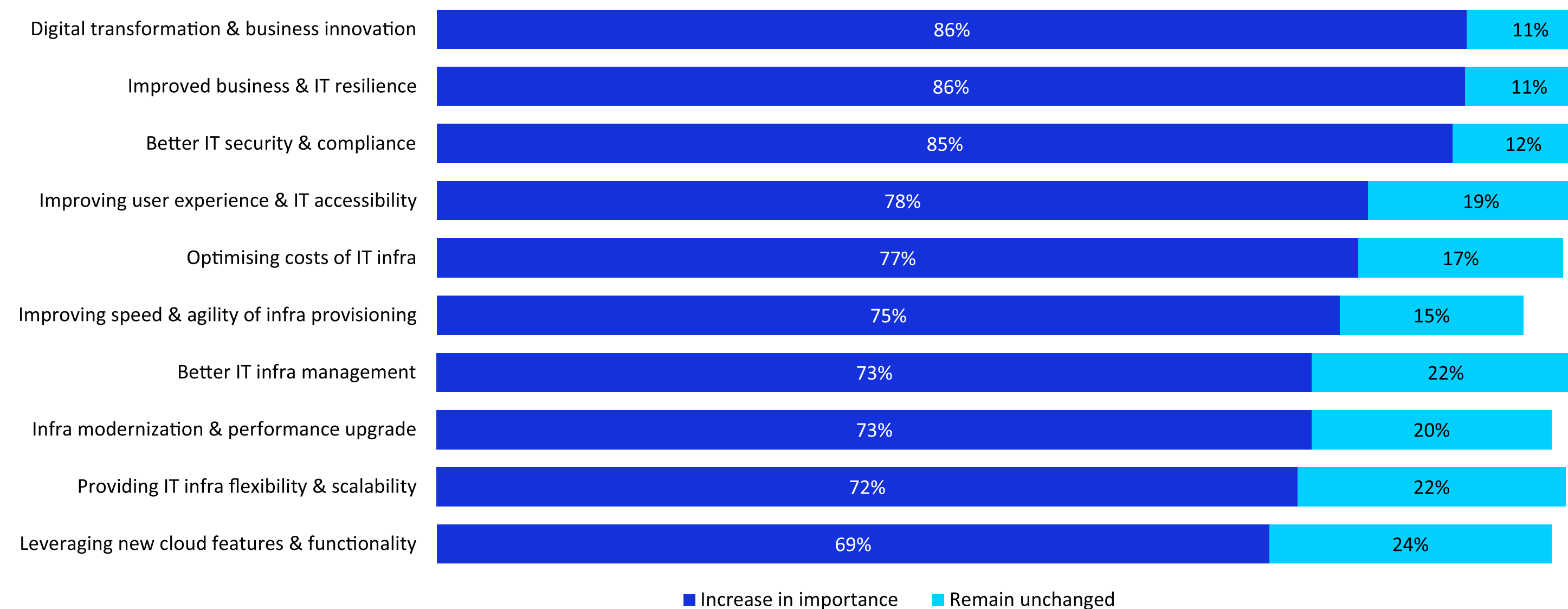
India Inc has clearly understood the value proposition of cloud and using it to achieve better strategic outcomes. The top three reasons for cloud adoption in the next 12 months are to drive digital transformation and innovation (86%); better IT security and compliance (85%); improve business and IT resilience (85%).

The need to drive digital transformation is closely reflected in the imperative to deliver better user experience and IT accessibility (78%) wherein decision-makers in IT perceives the end consumer

and internal business as its users. The speed and agility (75%) of cloud is a lever IT is using to enhance user experience in a seamless manner. Cloud accessibility makes it easy to experiment and fail fast empowering businesses to innovate frequently, provide new features and functionalities to enhance user experience

Accessibility also supports infrastructure modernization and upgradation to better application performance (73%). The visibility and flexibility Cloud accords is enabling businesses to optimize IT infrastructure costs (77%); and better manage the infra (73%).

## Why will your use of cloud services change over the next 12 months?



## Challenges in Using Cloud Services

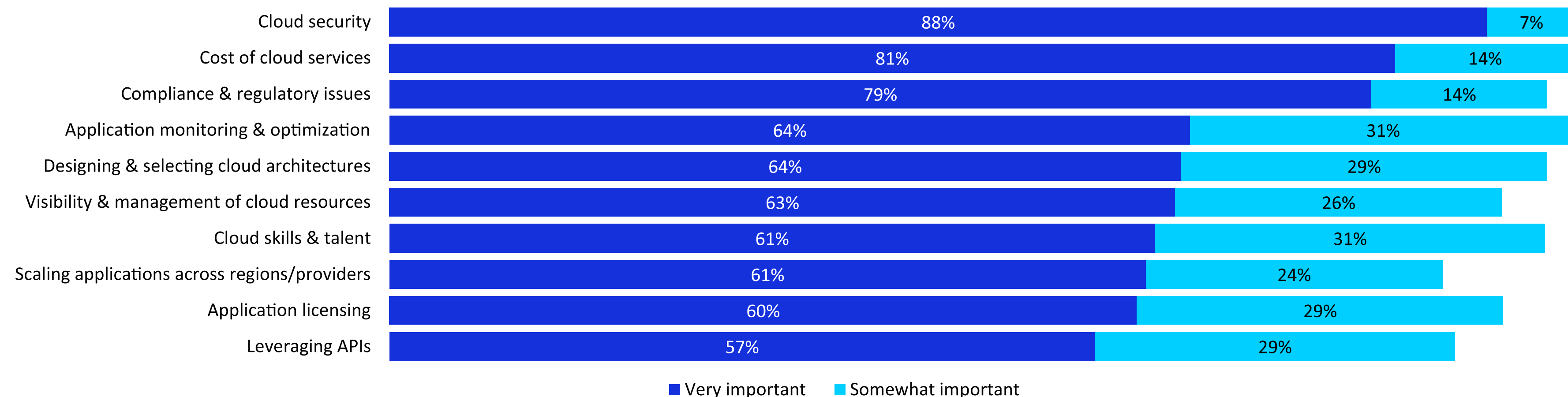
Businesses have accurately identified managing cloud security as the top challenge amongst 88% respondents. Cloud security is different from traditional environment as security is a shared responsibility where the CSP is responsible for the physical security of the data center and the underlying infrastructure, while security of the infrastructure resources and the applications must be configured by the customer—the customer decides who has access to which resources.

Several factors make cloud security more challenging. The easy accessibility means individual departments are setting up environments separately, and if the configuring is not secure the

entire organization is exposed to data breaches and compliance and regulatory challenges (79%). Easy accessibility is also creating challenges for ensuring adequate visibility and management for 63% respondents which is causing a larger challenge of managing the cost of cloud resources for 81% respondents. Cost management is also due to poor hygiene practices such as leaving unused resources on, underutilized resources and misalignment of subscription option.

Managing workloads across cloud providers are less challenging at 48% and scaling across regions and Cloud providers at 61% indicating low adoption of multi-cloud workloads in which managing security could be a key deterrent.

## What are your main concerns about IT infrastructure?





## What Kind of New Cloud Initiatives are Businesses Exploring?

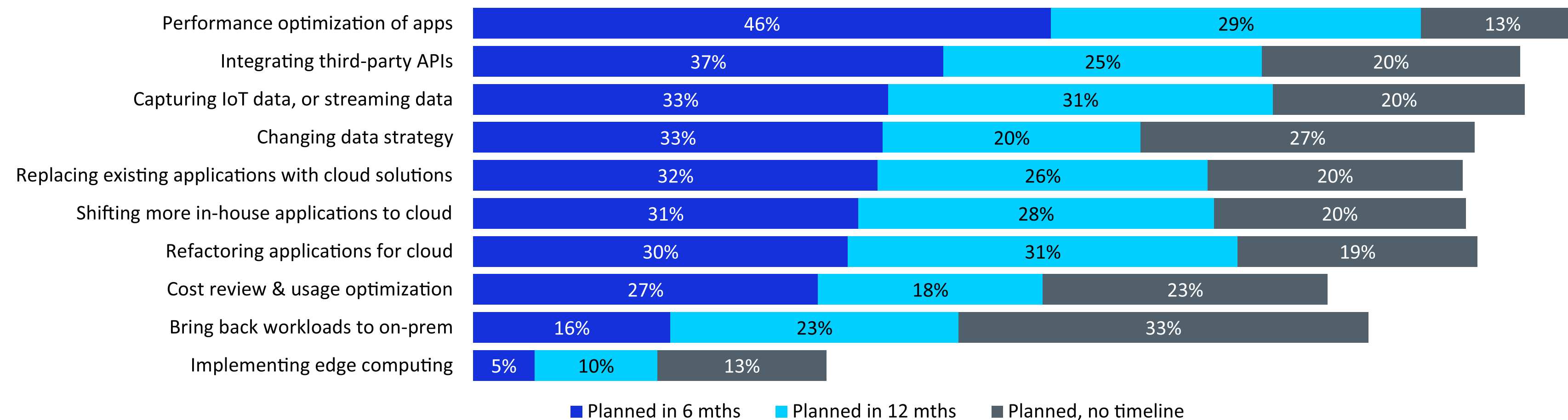
Cloud migration may be gaining momentum but Indian businesses are clearly grappling with performance issues and 75% respondents prioritizing the need to optimize application performance in the immediate or medium term. Organizations are also seeking to exploit the API economy. Deeper integrations are on the cards as organizations seek to create more value in the next 12 months amongst 62% of the respondents.

Refactoring applications is a priority for 61% respondents indicating the momentum in migration

and an awareness that cloud-native architecture yields better outcomes. The cloud march remains unabated with 58% indicating an intent to replace existing solutions with cloud services and another 59% intending to migrate in-house applications to the cloud in the next 12 months.

Organizations are aligning the data strategy with cloud and one third organizations are looking at changing the data strategy with the need to harness IoT and streaming data becoming a priority. The good news is that no respondent has mentioned the possibility of repatriating workloads back to on-premise.

## What are the new cloud initiatives being planned?



## How are Businesses Benefitting from Cloud Services?

Indian businesses are reaping the classic benefits of cloud adoption including cost savings (60%); business agility (59%) and leveraging for disaster recovery (59%).

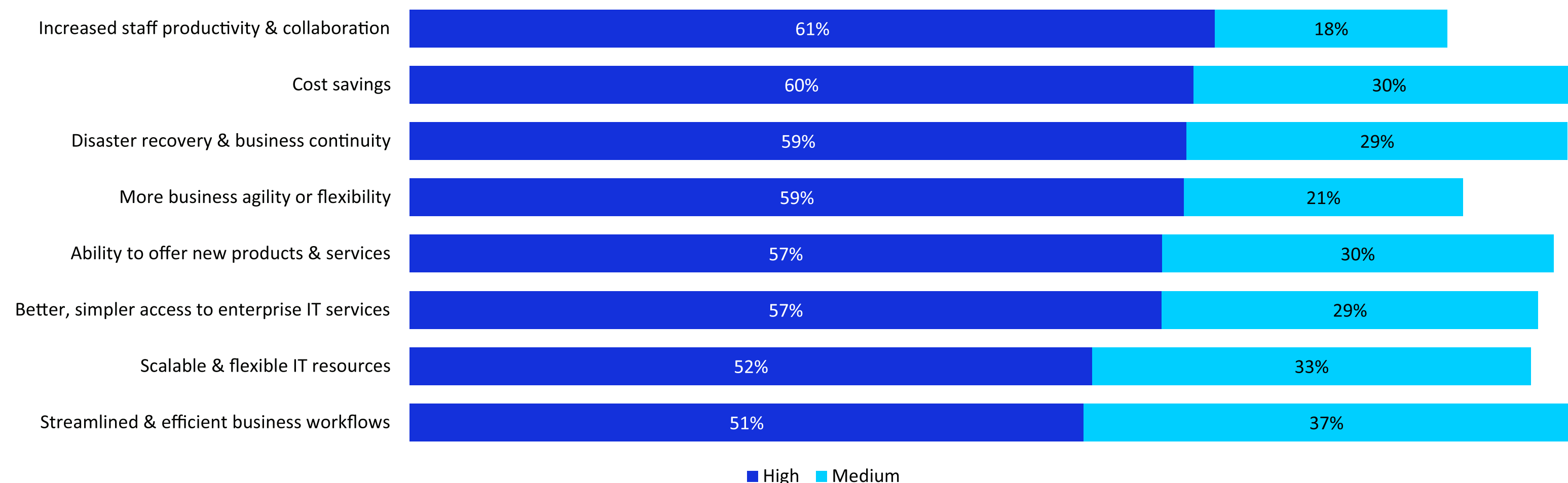
Cloud has democratized access to resources, making available powerful processors to run complex applications, experiment with data, analytics and machine learning applications at a fraction of the traditional cost. Cloud-enabled AI/ML adoption in corporate India is gathering momentum with a total of 83% respondents indicating it has delivered high to moderate level of impact. These capabilities have empowered organizations with game-changing

capabilities to better innovate and offer new products and services (57%).

Clearly adopters in India are discerning and are extracting benefits with from hanging fruits. Cloud has equipped businesses to offer better and simpler access to enterprise IT services (57%) and streamline business workflow (51%) which has bolstered productivity and collaboration (61%) and equipped with greater flexibility to allow employees to work from anywhere (45%).

Organizations have benefitted from the in-built scalability (52%) that cloud accords and this has resulted in improved application performance (48%).

### Business Benefits from Cloud?



# Sound Foundations for Data Harvesting and Advanced Analytics





ata analytics is emerging as a transformative force driving innovation and growth across sectors in India. There is an explosion of data triggered by

digitalization, proliferation of smart devices, social media engagements, e-commerce activities, IoT deployment.

The government's Digital India initiative to provide e-services to citizens and the launch of 5G network is triggering an unprecedented growth in data generation. Public cloud services and the proliferation of data centers in India is making scalable storage capabilities easily accessible at cost-effective rates.

Consequently, data storage is witnessing a huge surge driven by business need for analytics, AI initiatives and meet compliance and regulatory requirements. This is validated in the survey findings where organizations are archiving copious amounts of data to meet regulatory and compliance requirements.

Technological advancements in AI, machine learning, and big data technologies are making data analytics

more accessible and impactful. Digital native companies such as fintech, edtech and ecommerce are using advanced analytics in innovative ways to design new business models; boost fraud detection; and manage infrastructure, logistics, operations and supply chain.

Fintechs are leveraging advanced AI models to offer financial products to the marginalized who do not possess the traditional parameters for risk assessment and credit worthiness. Just as retail and e-commerce companies are offering personalizations based on historical data, customer segmentation and personal preferences.

The survey finds that Indian businesses understand the importance of having a good data architecture and technology infrastructure to meet with strategic goals and using a systematic approach to implementation. There is also evidence of advanced data adoption with third-party data integration, data warehousing and data lakes with pipelines— all of which indicate copious harvesting and mature processing capabilities.



Serious efforts are being pursued to ensure good quality of data with processes and mechanisms for data capture and validation; data aggregation and harmonization and de-duplication.

Organizations are using data for advanced analytics to better achieve profitability, manage risks, streamline operations and improve efficiency, and enhance sales and marketing outcomes. The most commonly used data applications are MIS reports and dashboards. Data security and privacy are being seriously managed with high adoption of governance best

practices including encryption, anonymization, access management polices and data backup strategies.

Yet organizations identified ensuring data quality and managing backup on an ongoing basis as a serious challenge. Getting leadership buy-in is the most important thing in implementing an effective data strategy, as leadership sponsorship is instrumental in fostering a culture of data-driven decision-making, encourages data sharing, and supports data initiatives across departments.

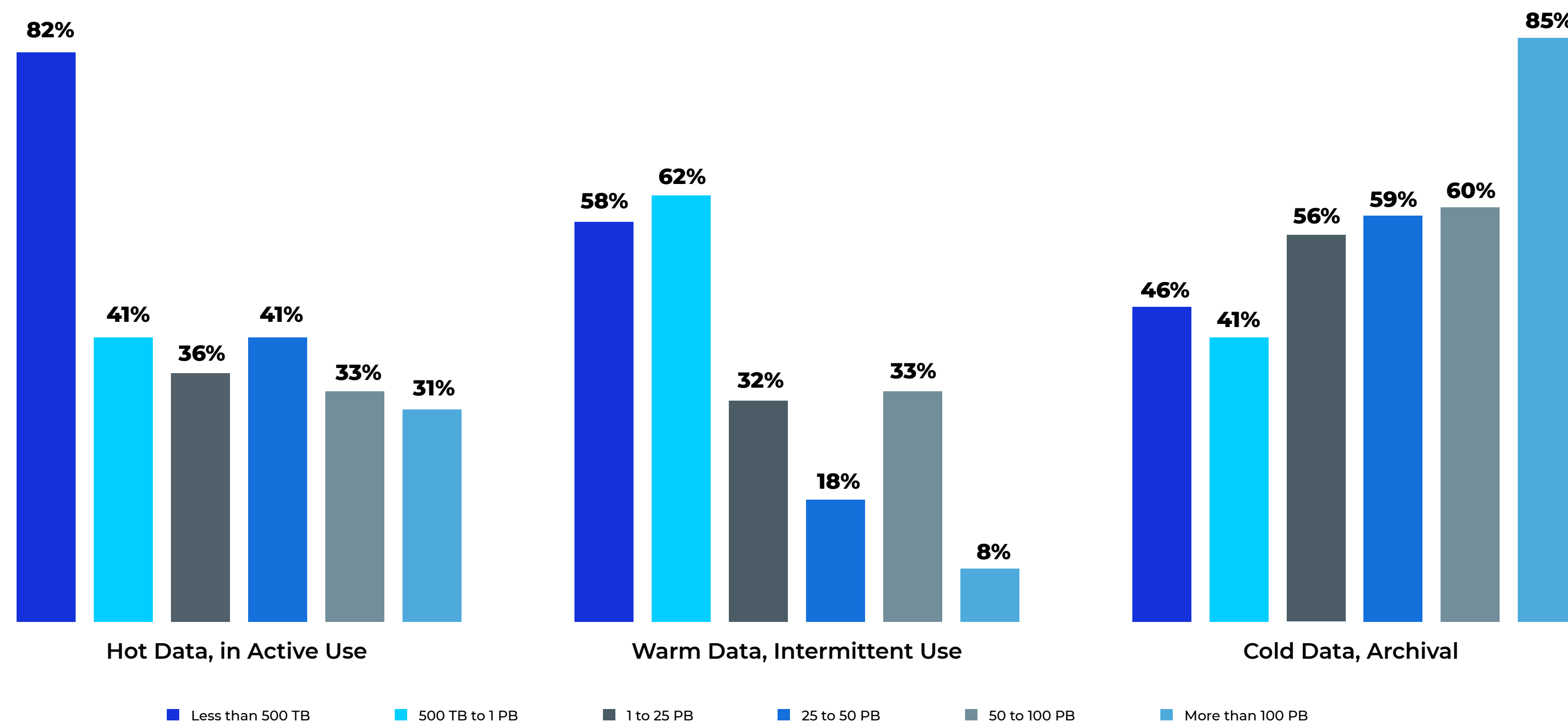
## Growing Volume of Data

With increased digitalization, organizations are creating and consuming more data than ever, and the volume of data stored within organizations is huge. Today Indian businesses have accumulated vast quantity of data with a significant number of respondents storing more than 50 PB of hot data which is in active use, across various tiers of storage. This is a huge volume of data, and to put it into perspective, 50 PB data is approximately 25,000

billion pages of printed text or 10 million minutes of uncompressed 4K Ultra HD video!

Businesses are also investing in storing data for archival purposes with many respondents putting petabytes in cold storage. This includes data from customer interactions, transactions, operational processes, IoT devices, social media, and more. The growing use and consumption of video within enterprises is also a factor in data volume growth.

## Total Data Storage



## How Fast is Data Increasing?

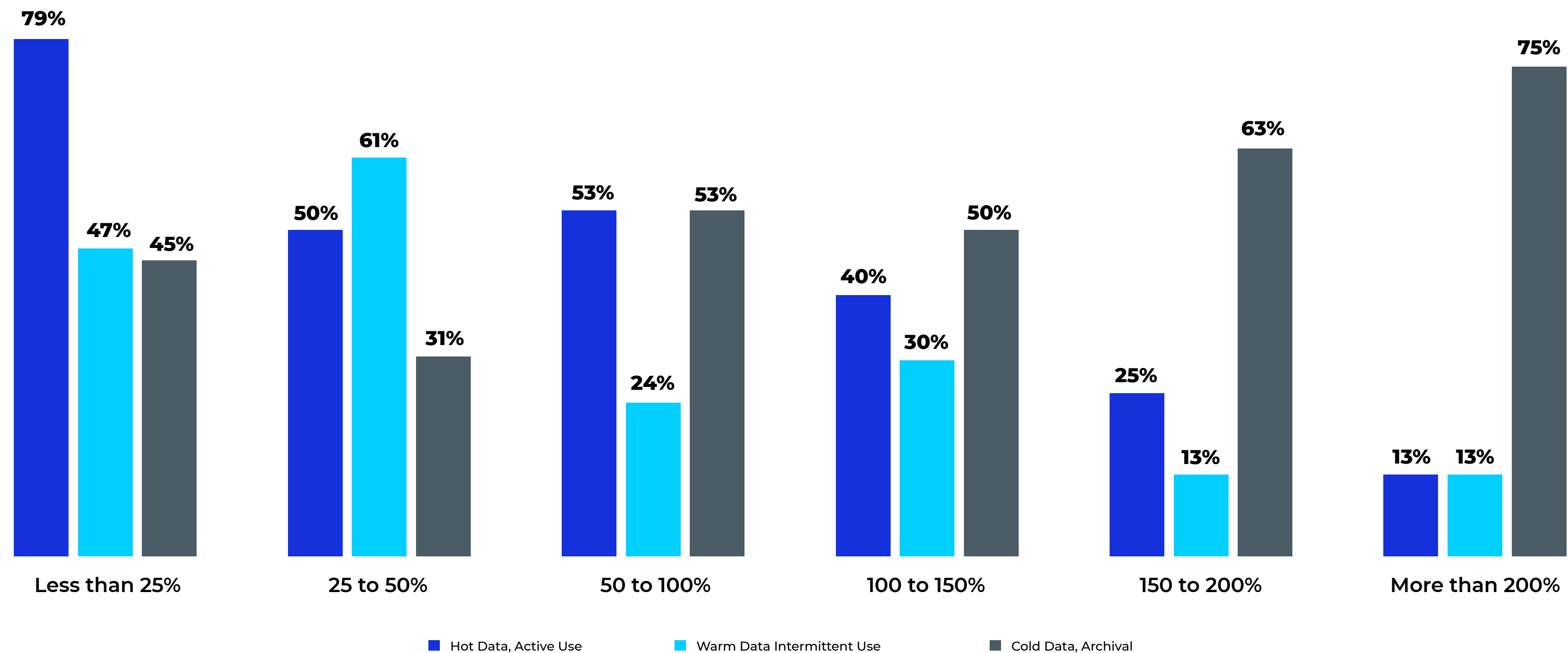
The volume of data across all tiers have increased significantly in the past 12 months. For instance, 53% respondents stated that the active data increased by 50 to 100% and 61% indicated that the warm data increased by 25 to 50% during the period.

Overall, cold data is increasing at a faster rate for most organizations. This indicates an increasingly

stringent regulatory environment and the need for organizations to store data for compliance. Also, some industries have an imperative to store customer interaction data.

Warm data is growing at a relatively slower pace indicating the maturity curve of data adoption wherein warm data is required for complex analysis such as predictive analytics and AI modelling.

## Overall Increase in Data Storage



## How Fast is Data Increasing?

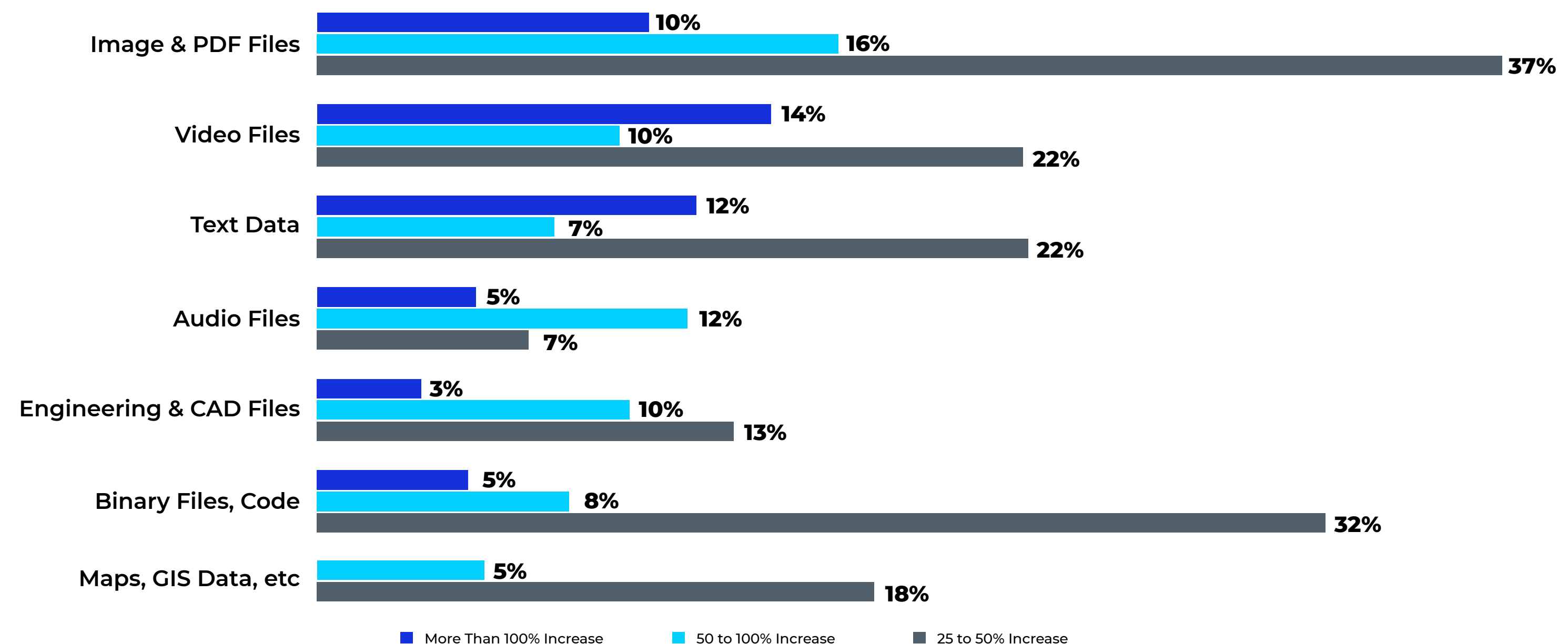
Clearly the way we consume and communicate information has undergone a dramatic shift and this is evident in the kind of content enterprises are using and storing. There is a surge in the storage of video with more than 14% respondents registering more than 100 percent growth. Image and PDF storage have increased by 50 to 100% for around 15% respondents. Businesses are increasingly using visual media in promotional activities and the rise of e-commerce is directly related to the role of images and videos to influence consumer behavior.

Rise in remote collaboration, healthcare, education, AI advancements and increased use of video surveillance have all contributed to the growth of media storage.

What is interesting is that text data is also growing at a similar pace amongst 12% respondents, driven by the need for regulatory and compliance requirements such as KYC.

An interesting trend is the emergence of maps and GIS as a new category of data being leveraged by corporates.

### Rate of Growth in Data





## Maturity of Data Strategy

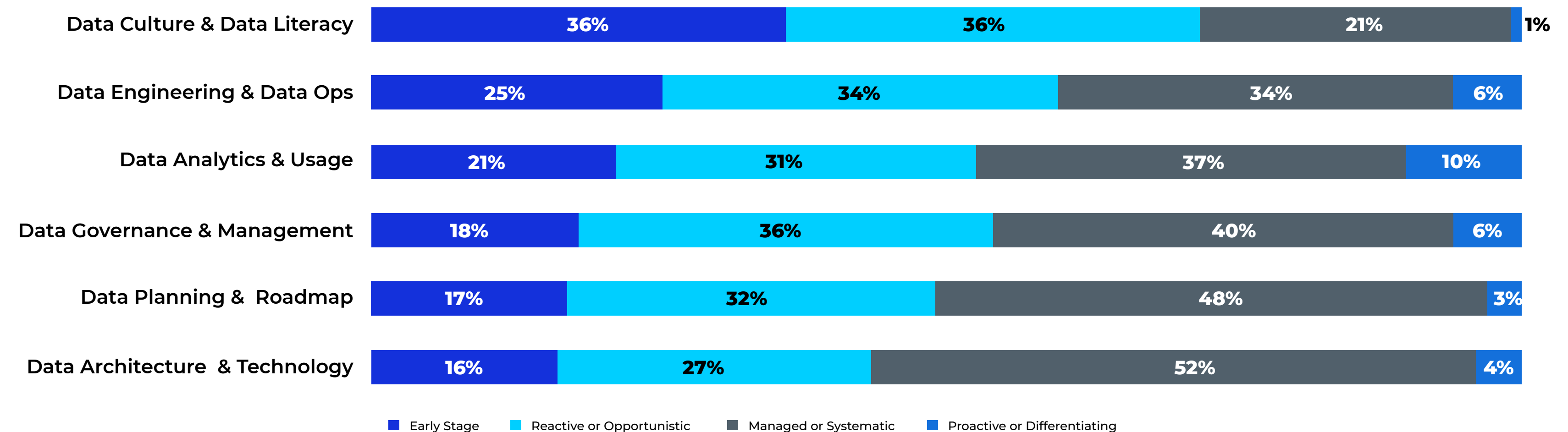
There is high level of maturity in the data strategy of Indian businesses with 52% having a managed and systematic approach with regards to technology and architecture and 48% towards data planning and roadmap indicating the foundations of a robust data strategy are well in place.

Businesses have cemented the strong foundations by embracing best practices in data governance and management (40%) with advanced adopters (6%) positioning data management as an opportunity to create a differentiation with high-quality data, enhanced security and privacy compliance, all of which foster trust in data-driven initiatives.

Embracing best practices in data engineering and DataOps (36%) in a proactive manner is enabling to creating differentiation (6%). This proactiveness has empowered businesses to use analytics in a systematic manner (37%) for differentiated business impact (10%).

A differentiated data strategy leverages data in innovative ways to gain a competitive advantage, drive growth, and deliver value to customers and stakeholders. It calls for prolific data usage wherein insight-driven decision making is embedded in the organizational culture. This is at mature stage for 28% respondents.

### Maturity of Data Strategy



## Data Strategy in Practice

Data utilization by Indian companies is reflecting the high state of maturity in the data strategy. For instance, a high percentage of respondents (57%) implementing data warehouse and an equal number (57%) integrating with third-party data sources correlates with a systematic approach to data architecture and technology.

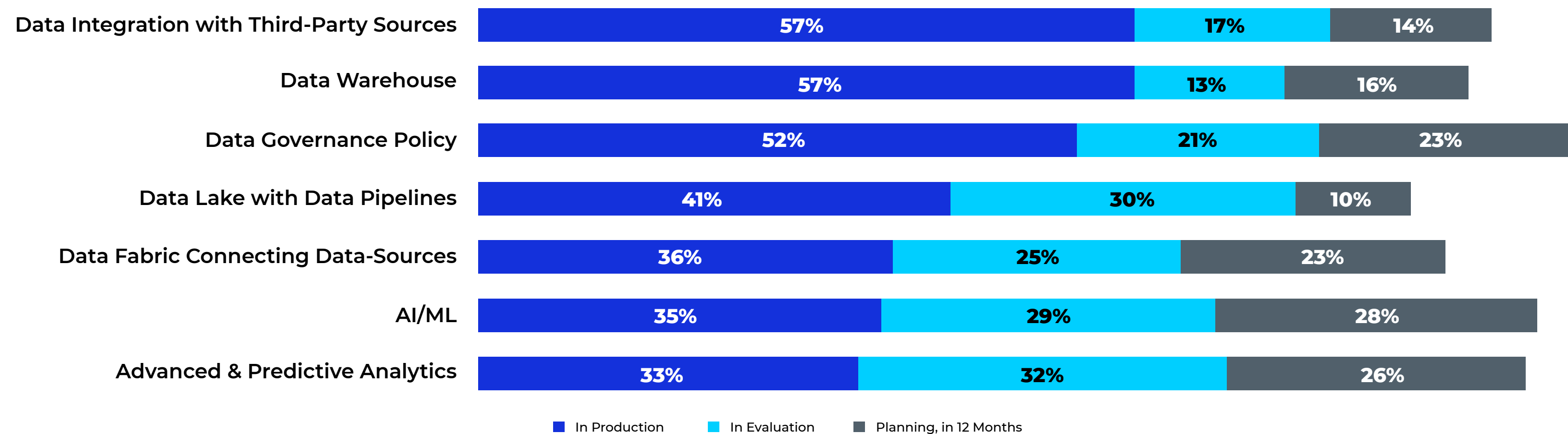
Given that data warehouses are designed to store structured data and have data consistency with well-defined schema to easily perform structured querying and analysis, its widespread adoption indicates prolific data usage by business analysts.

Integration with a multitude of data sources is enabling many companies to implement AI/ML (35%) projects and advanced analytics (33%). An equally large number of respondents are evaluating AI/ML and advanced analytics.

It is interesting that respondents have favored AI/ML investments over predictive analytics. One reasons could be that some may have considered predictive analytics as a subset of AI/ML investments.

Data lake with data pipelines is beginning to make its way into enterprises and many are evaluating it, indicating more businesses are focusing on harnessing unstructured data.

## State of Data Strategy



## Data Quality & Integrity

Regulatory and compliance requirements are clearly playing an oversized role in influencing the data strategy and implementation. An overwhelming majority have implemented data backups (82% plus 10% projects are underway).

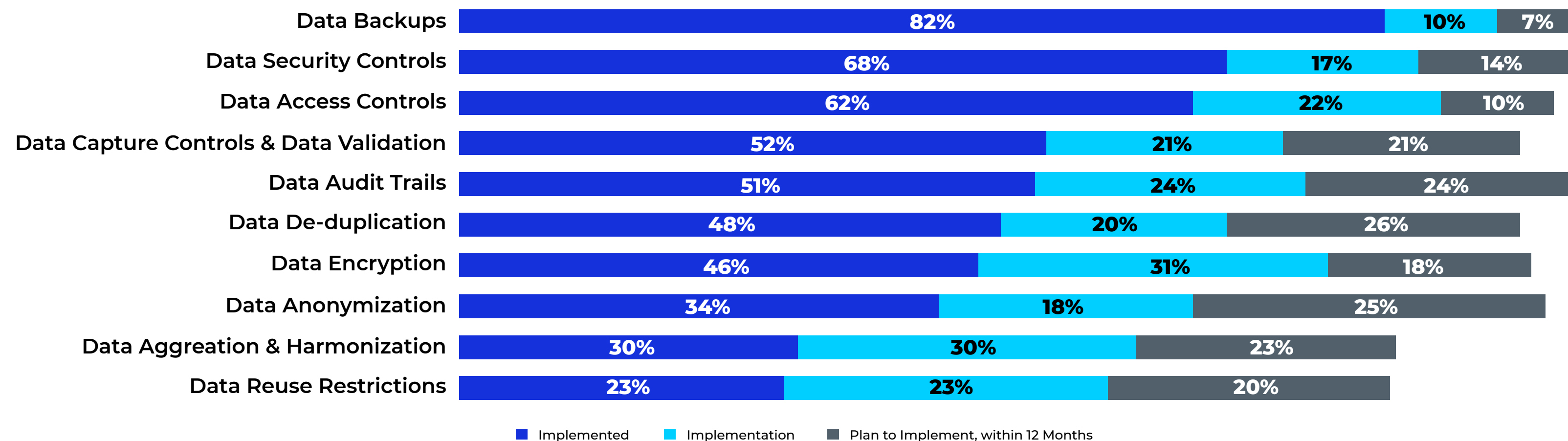
Data backup is essential to meet regulatory and compliance and business continuity goals and not directly related to data quality. However, its inclusion indicates mature strategy as backup is crucial in comprehensive data management and risk mitigation.

Risk management is playing out in implementing data security controls (68%) and access controls (65%).

A high percentage leaning towards data encryption (77% implemented/implementing) indicates a proactive risk mitigation strategy. With accelerated Cloud adoption and increased collaboration amongst stakeholders, data is shared across environments and encryption is a good practice to protect data privacy and meet compliance requirements while transporting data and while at rest.

Data audits (51%) and data deduplication (48%) are again risk mitigation strategies, while data capture controls and validation (52%) and anonymization (34%) are best practices directly impacting data quality and integrity.

### How are you ensuring data integrity?



## Data Use in Enterprises

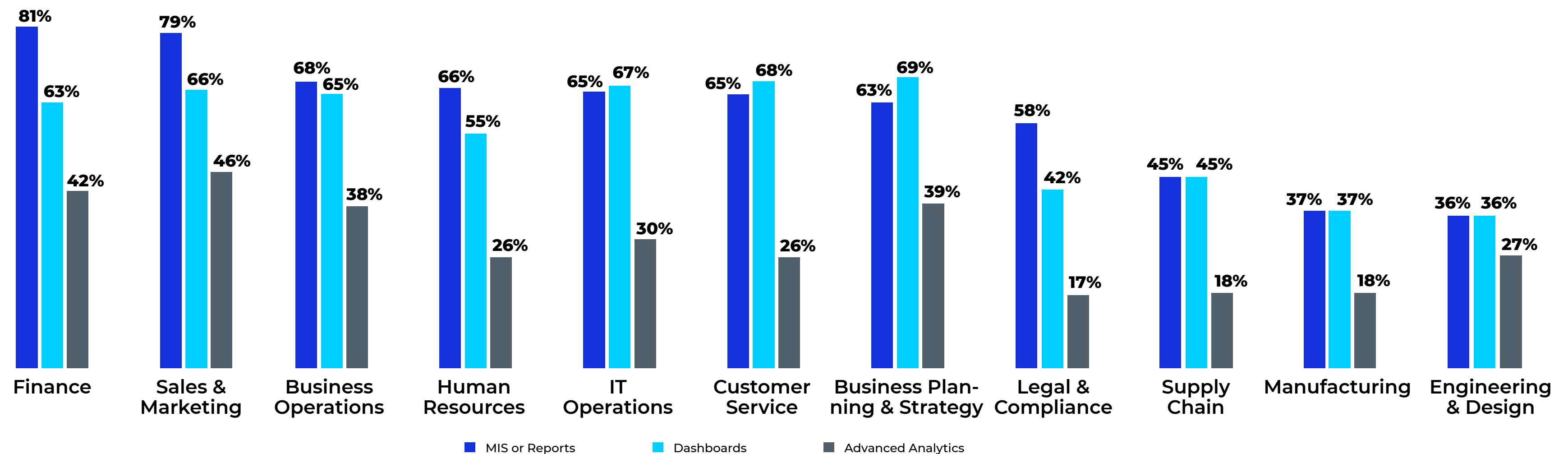
MIS reports and dashboards are widely adopted across departments and business functions. Within business units, the most prolific utilization of data is amongst Finance, Sales and Marketing, Business Operations, and Planning and Strategy.

MIS reporting, dashboards, and advanced analytics are indispensable tools for finance departments for scenario-planning; forecasting and budgeting; performance management; ensure compliance; manage risks; and effectively communicate with stakeholders including senior management, board members, investors and regulatory authorities. Advanced analytics enables sales and marketing teams

to get insights into customer behavior, preferences, and market trends to make informed decisions on strategies, target audience selection, product positioning, personalization and marketing campaigns.

Dashboards and analytics are helping streamline and better operations, strategy development and planning with competitive market intelligence, resource planning, identify new opportunities, manage partners and supply chain, get visibility into operations and streamline activities. Businesses are primarily using MIS reporting and dashboards to manage operations in departments such as IT, HR, customer service, administration and facilities management, manufacturing, and supply chain.

## Use of Data Analytics Across the Organization



## Challenges in Implementing Robust Data Strategy

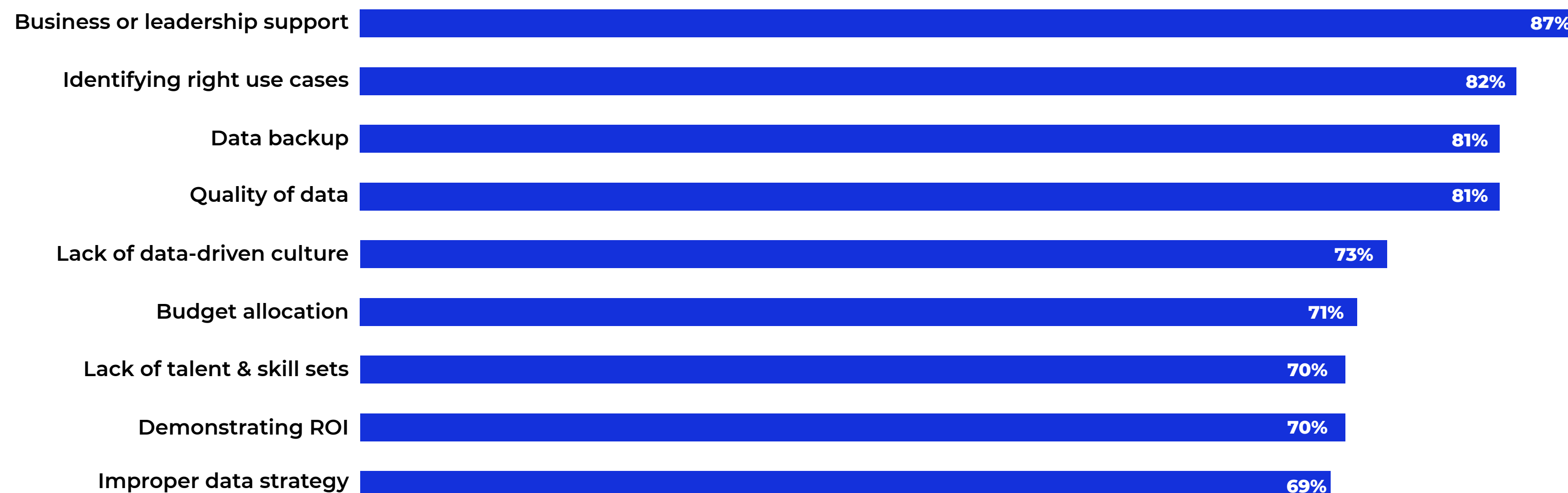
An overwhelming majority of respondents has indicated getting leadership support and business participation (87%) as a very important challenge. Implementing a robust data strategy often requires significant changes in how data is collected, managed and used. Some employees and leaders may resist these changes due to concerns about disrupting existing workflows or lack of understanding of the benefits of a data-driven approach.

Also building a data-driven culture requires leadership support and the active involvement of employees at

all levels and fostering a data-centric mindset may be a challenge if there is resistance. Identifying the right use cases (82%) is important to showcase the benefits and bring leadership and employees onboard. To achieve this quality of data (81%) is crucial to act decisively and get competitive advantage.

Data quality directly impacts the effectiveness of decision making and success of new business initiatives. Getting good quality data entails sourcing it from multiple sources, putting in place governance strategy, safeguarding data privacy with anonymizing techniques, all of which must be meticulously implemented.

## Challenges in Implementing Data Analytics Program





# India AI Growth Story on **Sound Footings**



The AI appeal in India is validated in the Stanford AI Index for 2023—India has been recognized as the top nation with AI skills penetration and

Indian companies focussed on AI-related products and solutions attracted the fifth highest investment in 2022.

Globally data-led businesses are poised to disrupt the environment with smart strategies to harness data for purposeful gains. Powered by cloud-enabled digitalization, AI is reshaping how organizations operate, interact with customers, and create value. AI-initiatives are fuelling differentiated strategies in customers engagements, business and strategic planning, research and development, financial operations, supply chain management cutting across industries.

Businesses exist because of customers and AI-led CX is bringing disruptive capabilities. AI-enabled analysis of customer data interactions empower businesses to predict potential issues or identify patterns to pro-actively address concerns before they escalate.

As customers increasingly seek seamless and personalized experiences, AI has become the linchpin of a successful CX strategy. AI empowers companies to better understand customer needs, insights into preferences and contextual information by analyzing vast amounts of data at speed and scale.

Early AI implementations were confined to IT and supply chain management. Having demonstrated its value proposition with greater efficiency and cost savings, AI adoption has transformed from a niche technology in fringe functions to becoming an integral component of core business applications. Now organizations are more confident that AI adoption can create impact and using it for competitive advantage. Adoption in core business applications is expected to accelerate with advancements in AI research, natural language understanding, and computer vision.

Organizations are widely employing AI to strengthen cybersecurity by harnessing its ability to analyze and interpret vast amounts of data in real-time to identify patterns, detect threats, automate responses, and augment human capabilities to protect the business.

As an emerging technology, AI adoption presents



different challenges ranging from selecting the right technology, designing and implementing appropriate models, and finding the right talent. Savvy organizations are partnering with specialist AI partners to harness the right technologies, access trained skill sets and work collaboratively to design AI models aligned with organizational objectives. At the same time, there is an emphasis to build internal AI capabilities.

All this is possible only when the leadership understands the transformative power of AI and strongly backs the initiatives to remove implementation and collaborative roadblocks with the organization. AI must be accepted and endorsed by business users to identify impactful use cases and trigger a groundswell of innovation and dynamism from within the system.



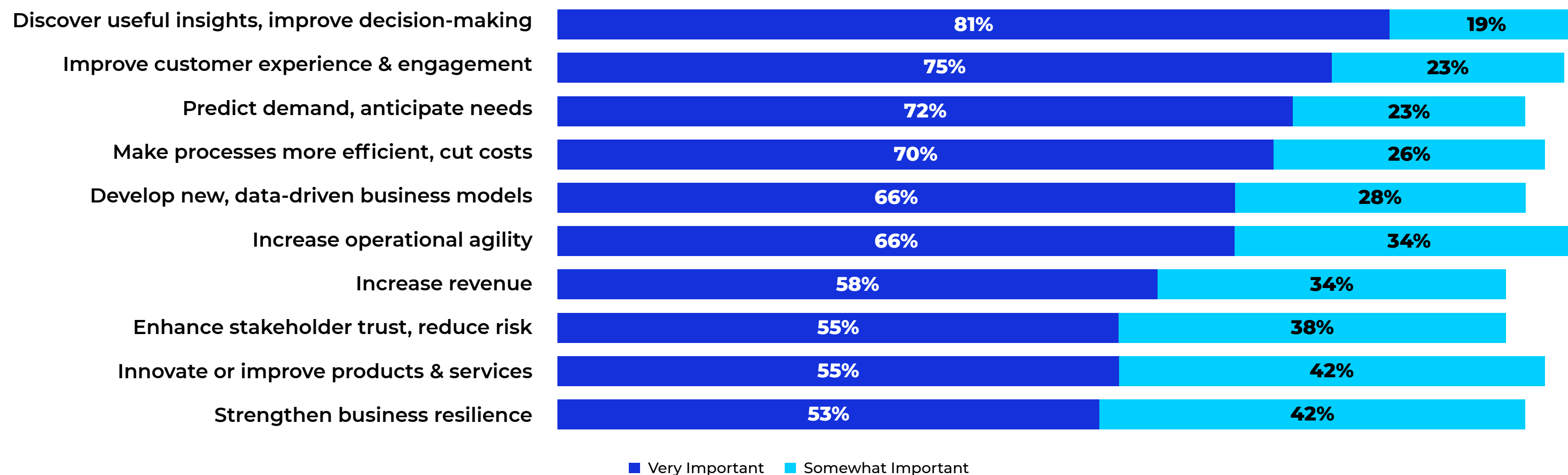
## Harnessing AI & ML for Business Impact

While most enterprises are leveraging AI/ML to make better, data-driven decisions, most organizations are leveraging insights to enhance customer experience (CX). From chatbots that offer instant and round-the-clock support to AI-powered recommendation engines that suggest relevant products, AI enhances CX across various touchpoints.

Delivering exceptional CX is increasingly becoming the differentiator to attract and retain customers and AI empowers companies to personalize interactions and deliver tailored experiences that result in higher

satisfaction and customer loyalty. Thus the top three drivers for AI in enterprise clearly indicate the need to discover useful insights and improve decision-making as the top outcome (81%) followed by the need to improve customer experience and engagement (75%) and predict demand and anticipate needs (72%). Many organizations are also recognizing the transformative potential of AI/ML technologies in cutting costs and driving process efficiency (70%); operational agility (66%) and develop new data models (66%) with predictive insights. Operational efficiency translates into faster response times, reduced waiting periods, and enhanced service quality, leading to higher levels of customer satisfaction.

### What are the business goals for AI & ML?



## AI Adoption in Business Functions

There are interesting AI/ML adoption trends in business functions which has progressed from a cautious approach to aggressive posture aimed at creating business impact. For instance, IT operations topped the list of most widely deployed usage across multiple functions (20%) followed by AI in research and development activities (14%) and supply chain operations (11%).

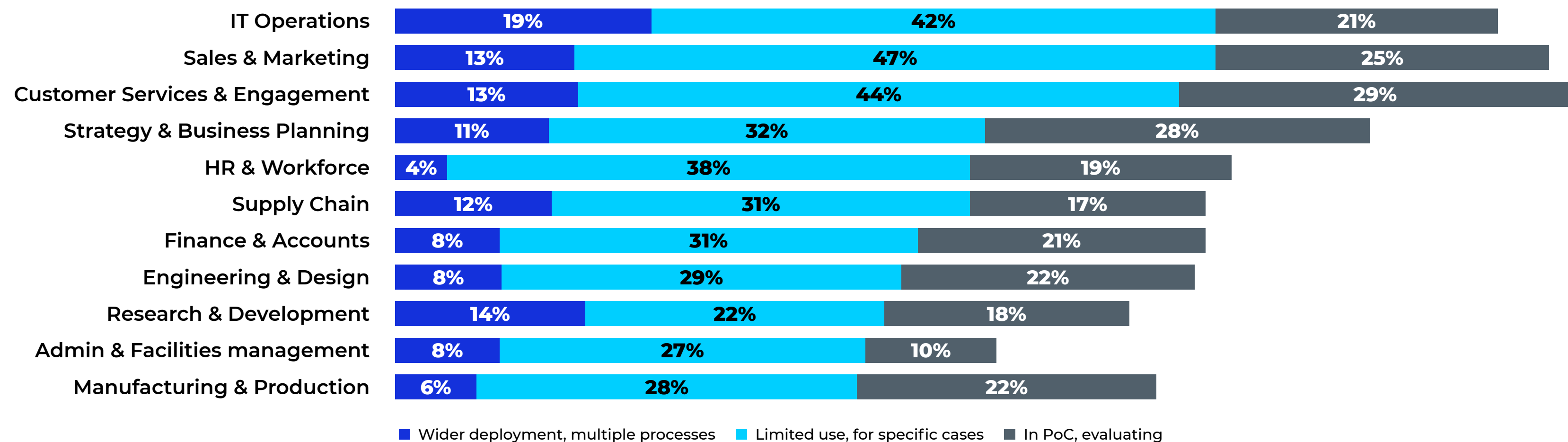
AI integration into IT departments revolutionized infrastructure management, cybersecurity, and data analysis. Automation of routine tasks, anomaly detection, and real-time threat assessment improved operational stability while supply chain management witnessed significant improvements with AI-driven

demand forecasting, inventory optimization, and logistics management.

Traditional R&D processes often involved sifting through massive datasets, which was time-consuming and resource-intensive. With AI/ML learning algorithms can quickly analyze vast amounts of data, identifying patterns, trends, and correlations that human researchers may have missed.

Contrast that with what is happening now in organizations—more AI projects in PoC and under evaluation are seen in areas which are at the core of business, such as, enhancing customer service and engagement (29%); and strategy and business planning (28%); and legal and compliance (28%).

## Who is Using AI & ML?



## Current Scope of AI Deployment

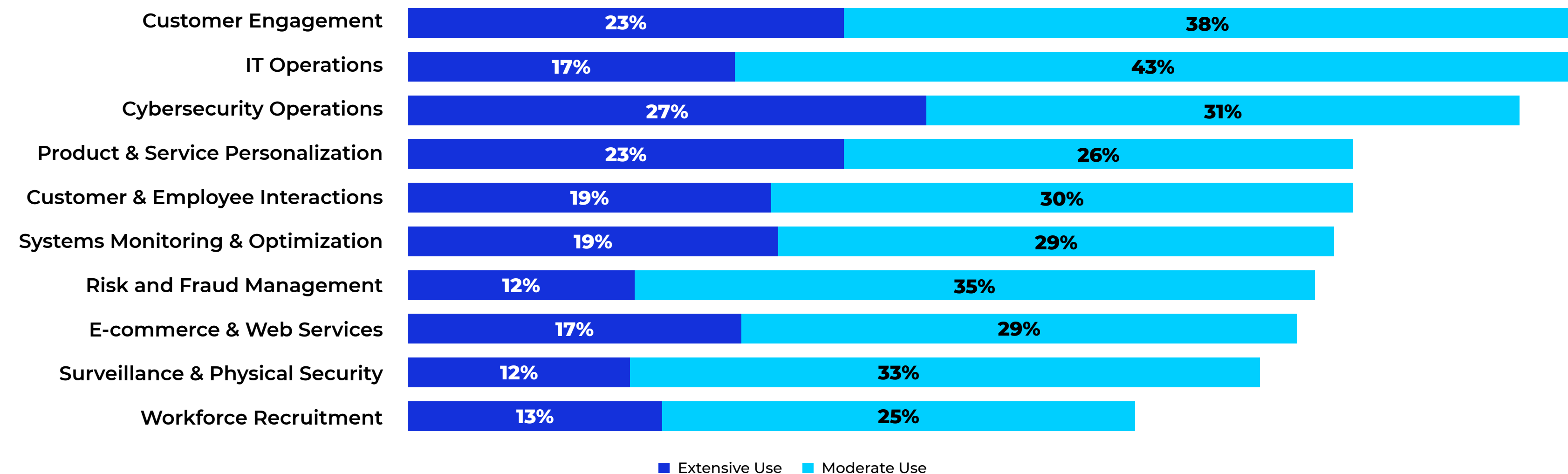
As cyber threats become increasingly sophisticated and pervasive, organizations are turning to AI to bolster cybersecurity with proactive detection, response mechanisms and fortifying defence (27%). AI is empowering businesses to defend against AI orchestrated attacks; perform root-cause analysis and reducing the burden on analysts by automating cybersecurity operations.

Intelligent cybersecurity systems analyzes vast amounts of data in real-time and monitor network traffic, user behavior, system logs to identify and detect patterns for potential threats. Also, algorithms can adapt to evolving attack techniques to enhance

detection capabilities; and initiate auto-remediation such as blocking suspicious activities, isolating infected systems, and patch and update.

Businesses are using AI to re-imagine customer engagement strategies (23%) and deliver highly personalized products and services (23%). AI is providing organizations with the tools to understand customer preferences, anticipate needs, and offer tailored experiences and create greater customer loyalty. AI-powered chatbots and virtual assistants eliminate wait time and offer instant human-like support to guide customers with relevant information, troubleshoot, and complete transactions.

## Where is AI & ML Being Applied?



## Spending on AI in next 12 Months

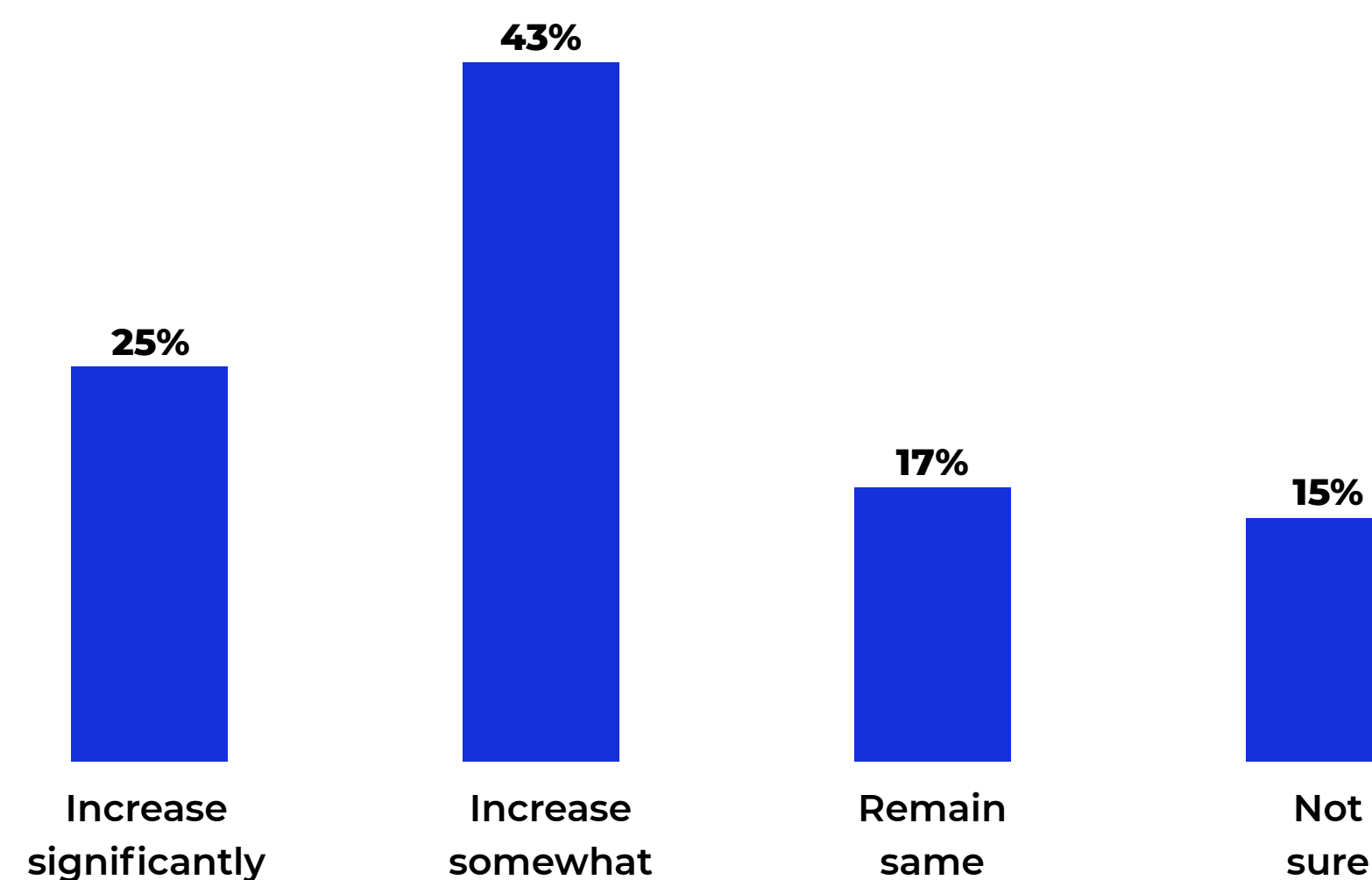
Clearly the value proposition of AI has been well-established and AI initiatives are set to scale in scope and into wider application areas. An overwhelming 68% are set to increase spending on AI initiatives in the next 12 months as more businesses successfully integrate AI solutions into operations and witness tangible ROIs.

AI is increasingly being used as a catalyst for digital transformation to achieve competitive edge with enhanced customer experiences. The versatility of AI is prompting businesses to explore diverse use cases, leading to a surge in AI spending.

The increasing availability of data and cloud-enabled access to massive processing power have significantly boosted AI capabilities. The sheer volume and velocity of data together with the open-source tools to gather, cleanse, tag and exploit data has lowered the cost and access barrier to harvest big data.

At the same time, the rapid evolution of AI technologies, such as natural language processing, deep learning, AR/VR is unlocking new possibilities with more sophisticated use cases. These advancements are increasing confidence in AI technologies resulting in accelerated spending.

### Change in spending on AI & ML in the next 12 months?



## Acquiring AI/ML Capabilities

Organizations are seeking effective ways to acquire AI capabilities by employing diverse strategies, including forming partnerships (38%), building internal expertise (36%) and leveraging AI-as-a-Service offerings (35%).

Forming partnerships with tech companies, startups, and research institutions allows businesses to tap into the specialized knowledge, latest technologies, industry best practices and accelerate AI implementation.

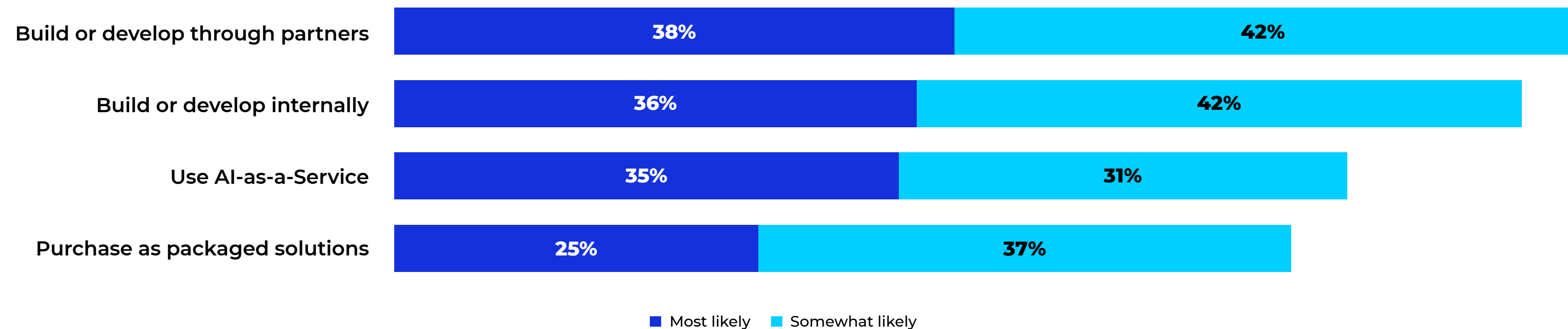
Some organizations are investing in AI-focused research and development teams, recruiting skilled data scientists, machine learning engineers, and AI specialists to build internal capabilities. Having in-house expertise empowers businesses to tailor AI solutions to unique needs, maintain control over sensitive data, and create a sustainable competitive

advantage through proprietary AI technologies.

Exploiting AI-as-a-service platforms is a savvy option as it is convenient and cost-effective to access AI capabilities without extensive upfront investment. Cloud-based services provide pre-built AI models, APIs, and tools that can be integrated directly into existing applications and businesses can choose from a range of offerings including natural language processing to computer vision, recommendation engines and sentiment analysis.

In fact organizations are employing a hybrid approach by combining multiple strategies to build sustainable AI strategies. For instance, they may collaborate with AI solution providers to address specific needs while simultaneously building internal expertise for more customized and proprietary AI solutions.

### How will you acquire AI & ML solutions?



## Challenges in Deploying AI Solutions

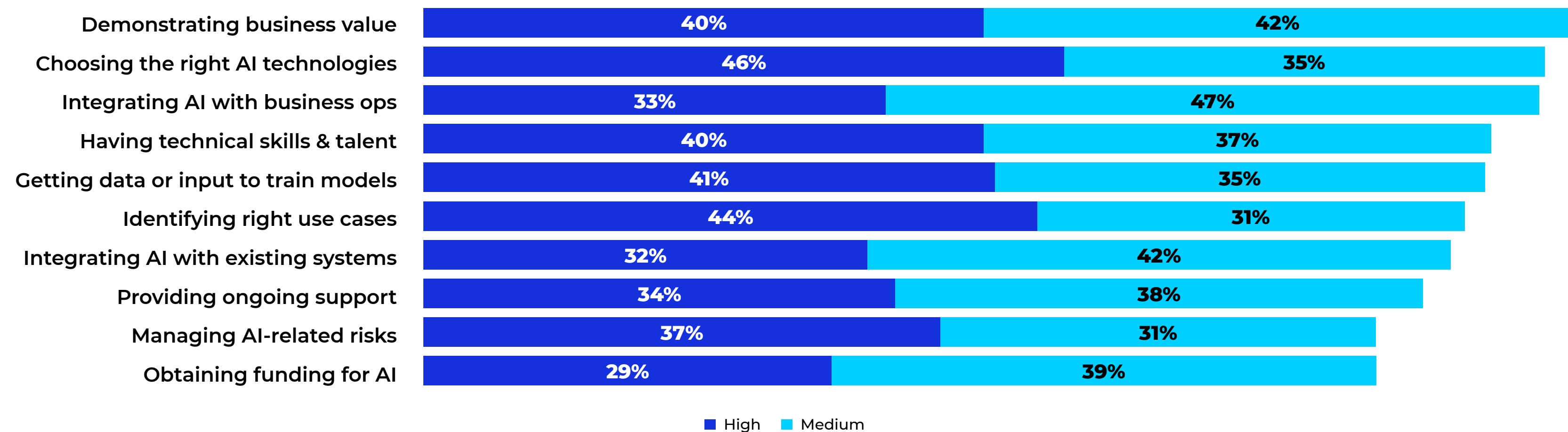
Embracing AI is throwing up significant challenges, chief amongst which is choosing the right technologies (46%) and identifying suitable use cases (44%).

The rapidly evolving landscape of AI technologies is overwhelming organizations and selecting the most suitable AI framework, platform, and tools to align with business needs is turning out to be the most formidable challenge. Determining the right combination of technologies that fit within the existing IT infrastructure and can easily integrate requires understanding of IT estate and AI technologies.

Some organizations struggle to identify the right uses cases wherein AI can create meaningful value; enhance existing processes; or create new opportunities. This requires a thorough understanding of business processes, customer needs, and industry trends to pinpoint areas where AI can make an impact.

AI models heavily rely on large, high-quality datasets for training and organizations are challenged with sourcing, cleaning, and tagging data (41%), especially when dealing with unstructured or sensitive data. Insufficient data can lead to inaccurate or biased AI models. Data governance, privacy, and compliance are also critical considerations in data for AI training.

### What are the challenges in deploying AI applications?



## Major Concerns in Scaling and Deploying AI

Due to the rapid advances and lack of insights in an emerging field, selecting the right technology (55%) is the most significant challenge in scaling AI deployments. Each AI technology comes with its strengths, limitations, and compatibility requirements and businesses must conduct thorough research to make informed decisions keeping in mind overall strategy and ensure the technology or platform is a future-proof.

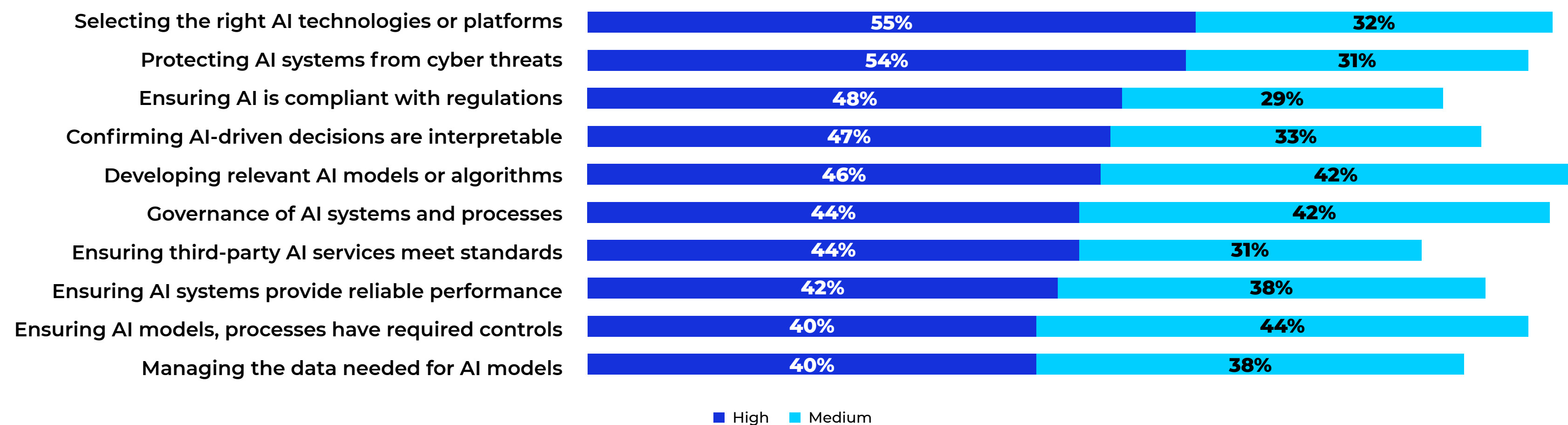
The choice of algorithms (46%) impacts performance, accuracy, and computational requirements and so algorithm evaluation, experimentation and monitoring are necessary to identify potential biases,

errors, and model drift.

AI deployments are natural targets of malicious actors and a major concern (54%) relates to the potential of manipulating input data to mislead AI models which can have serious consequences in critical applications like autonomous vehicles, healthcare diagnostics, and financial systems.

Scaling AI is commonly plagued by Explainable AI (XAI) as deep learning neural networks have numerous input features and hidden layers, and it is difficult to identify which factors significantly influenced a particular decision (47%). Understanding the relative importance of input features is important to build trust in the model.

### Concerns about Deploying and Scaling AI Systems?



## How Important is Organizational Culture in AI Success?

Respondents identified leadership support as the most crucial element for successful integration of AI/ML technologies. A strong and supportive leadership team (79%) enables to create a clear roadmap for AI/ML adoption, define key performance indicators (KPIs) to measure success, and establish a framework to evaluate the ROI.

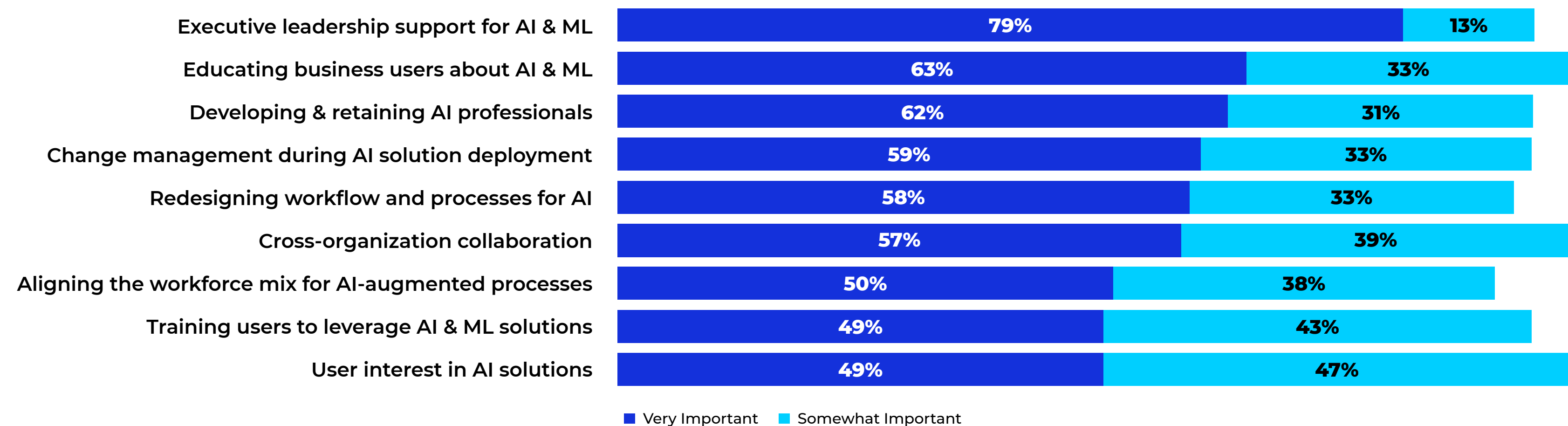
Leaders can identify strategic use cases where AI/ML can have the most significant impact, prioritizing projects that drive tangible value and competitive advantage. Their involvement helps avoid disjointed and ad-hoc AI/ML implementations and encourages a more cohesive and integrated approach across

different business units (57%).

Educating business users about AI/ML empowers employees to make informed decisions about AI/ML adoption (63%) by dispelling misconceptions and ability to identify suitable AI/ML use cases within their domains to better drive innovation and efficiency while avoiding unrealistic expectations. Crucially, input data from business users help data scientists and AI experts refine models and tailor solutions to better suit business requirements

Developing and retaining talent is crucial (62%) to provide stability to AI initiatives which will then yield sustainable business impact.

### Role of Organizational Culture in AI & ML





Securing Digital Transformation:  
**Focus on Employee Education and Re-Skilling**





Indian businesses and government organizations have experienced an exponential increase in cyberattacks spurred by digitalization of

businesses and government activities. Also, the use of hacking as a tool for activism, political agenda and military objectives has made India one of the most targeted nations in the world for cyberattacks—the highest in Asia and the second most attacked nation in the world after the US in 2022—according to a report by CloudSEK.

Another chilling trend reported by cybersecurity firm Kaspersky is that 9.8% of all data leaks in Darknet is related to Indian companies, and 35% of all insider active sell orders placed on the Darknet in 2021 entailed Indian companies.

Our survey confirms that Indian businesses are facing the heat with phishing, ransomware and malware attacks topping the list of security ingressions. Organizations have suffered financial and reputational setbacks as a result of data breaches that have compromised sensitive information and caused business disruption.

Coping with the constantly evolving threat landscape is challenging, particularly since there is an emerging ecosystem of players that offer ransomware-as-a-service that has turned the cybercrime economy into an industry. The proliferation of sophisticated cyber threats coupled with lack of skilled cybersecurity professionals have added layers to the already vexed cybersecurity problem.

In this equation, people are the weakest link and often open the door to let in malware and malicious code by falling prey to social engineering techniques. Businesses are combating this by ramping up education and awareness programs; instituting enhanced systems and processes; and implementing sophisticated monitoring tools.

To bridge the skill gap, businesses are investing in training and upskilling in-house teams and also partnering with service providers. Third-party partners are playing a crucial role in helping businesses achieve cyber security goals by providing access to specialized skills, advanced technologies and round-the-clock monitoring services.

Businesses are building defence strategies by conducting penetration testing, security



audits, setting up security operations center and implementing identity and access management. Much of the operations are being manned by in-house IT teams to achieve responsiveness; better collaboration with other departments; and minimize the risk of theft and unauthorized access.

A key pillar of security fabric of the organization is to embed security as part of the organizational culture, wherein employees embrace it as a shared

responsibility and do not perceive it as a hinderance to productivity. Security in the cloud is a shared responsibility wherein the customer is responsible for managing access and therefore designing security-by-design architectures play a crucial role and denying access by default is a best practice.

Knowing and embracing cloud best practices is a prudent approach to beat cyber security blues.

## Severity of IT Security Incidents

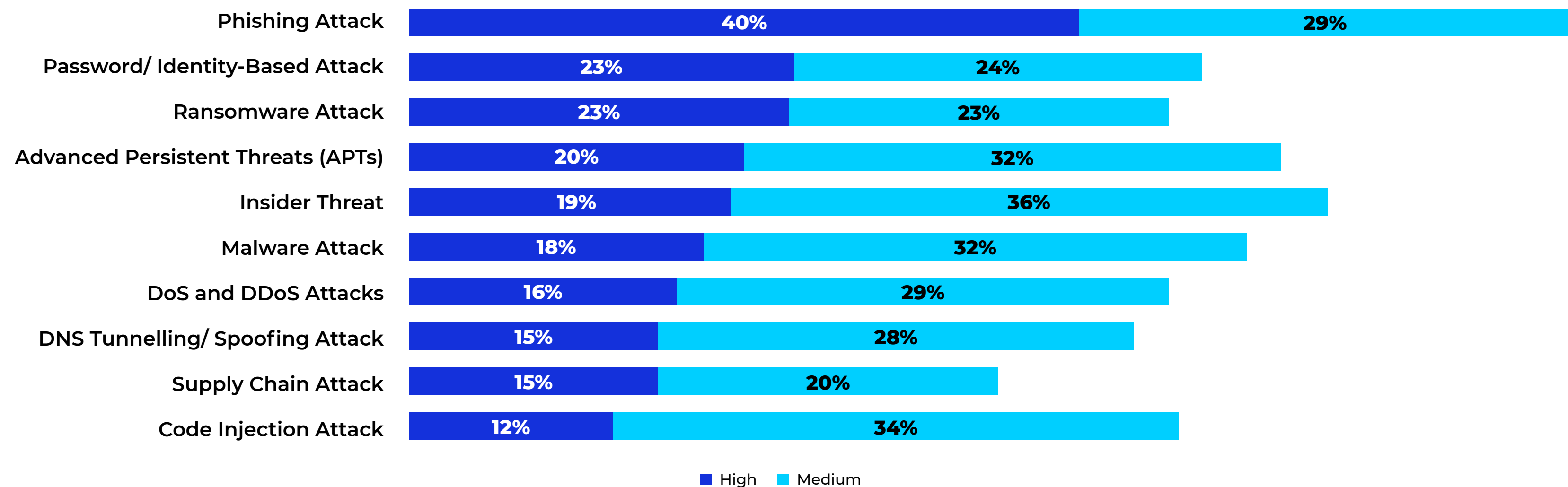
Phishing has been identified as the most severe form of security incident by 40% respondents. Ransomware attacks are prevalent but not as rampant.

People continue to be the weakest link in the cyber security chain. Hackers employ social engineering tactics to trick employees with innovative techniques that appear genuine and lure them into clicking on malicious links, share confidential information and inadvertently allow access. Despite training and awareness programs employees continue to walk into traps.

About 36% respondents have attributed insider threats as the cause of security incidents with moderate severity. Careless employees who do not adhere to company policies or bypass company security measures for convenience often cause security breaches. Sometimes disgruntled employees resort to malicious activities including stealing or deleting data, selling or exposing data with an intent to harm the organization.

Ransomware attacks has been severe amongst 22% and moderately severe amongst another 22% respondents, indicating ransomware is clearly a major source of threat to Indian businesses.

## Severity of IT Security Incidents



## Impact of Security Incident

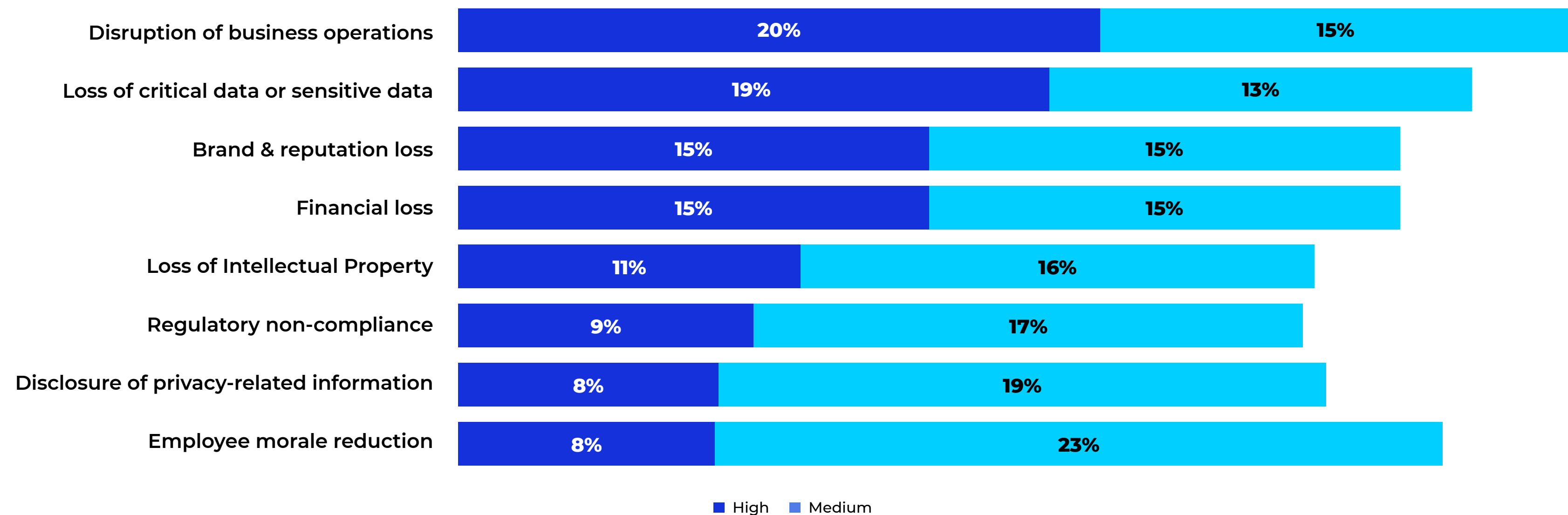
The most widespread impact of security breaches include disruption to business operations (27%); loss of critical/sensitive data (19%); financial loss and affecting the brand and reputation (15%).

What stands out as a deeper impact of data breach is that it affects the morale of employees (23% have indicated it as an impact with medium degree). This becomes a red flag because when a setback percolates to employees it has ripples effect on the efforts and enthusiasm people bring to the workplace including the quality of service to customers.

Ransomware attacks deny access to organization's own data and disrupt business operations until the ransom is paid affecting productivity, customer confidence and brand reputation. Often the cost of retrieving data can be crippling with an estimated global average cost at USD 4.35 million per data breach, according to a study by Ponemon Institute.

The impact of data breach on Yahoo valuation is well documented which shaved off USD 350 million in its valuation after the breaches came to light.

## Impact of IT Security Incidents



## What Causes Data Breach?

Time and again, it has been established the vulnerability of man is man himself. So is the case with cyber security. Despite automation and sophisticated tools human error (22%); social engineering where employee commits mistakes (12%); misconfiguration (which occurs occasionally for 34% respondents) top the reasons for data breach.

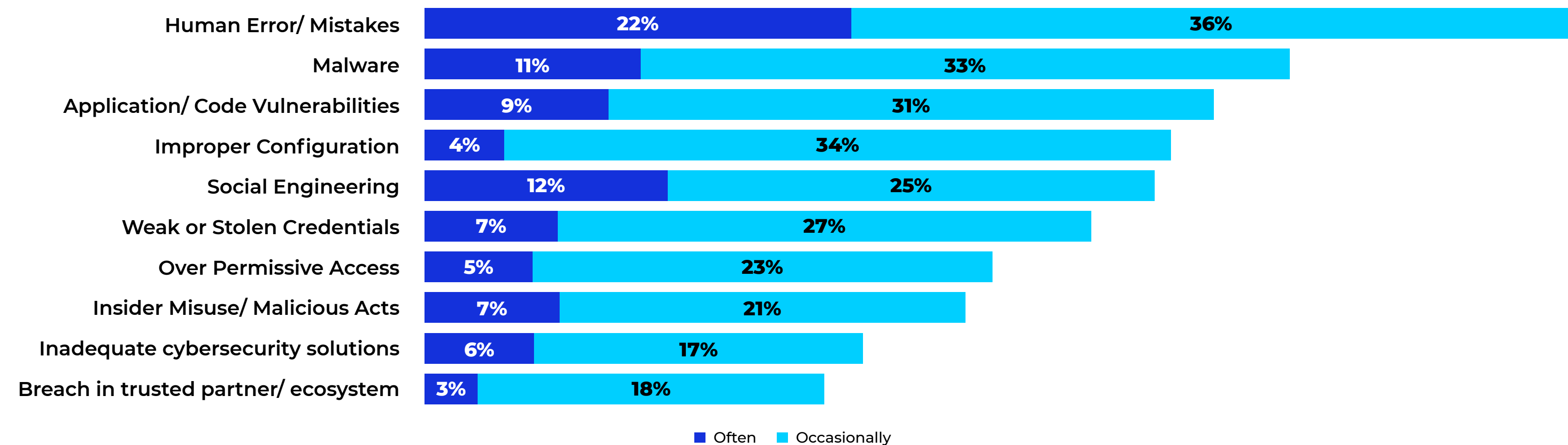
Lack of skills and understanding about cloud technologies is causing human errors and misconfiguration issues. Unlike traditional environment where a perimeter-based approach worked, as enterprises resources were placed within a network, the imperative of remote working and

mobility along with popularity of cloud require modern approaches to security management.

Cloud security is a shared responsibility where customers are responsible for configuring access to resources while the cloud provider ensures physical security of the datacenter and the underlying networking and infrastructure resources.

Reports abound of how many large businesses have often misconfigured cloud resources such as AWS S3 and Azure Blob. More importantly it happens across customer segments—mature and inexperienced cloud users—reaffirming that human element remains the major cyber security vulnerability.

## Causes for IT Security Incidents



## Challenges with Cloud Security

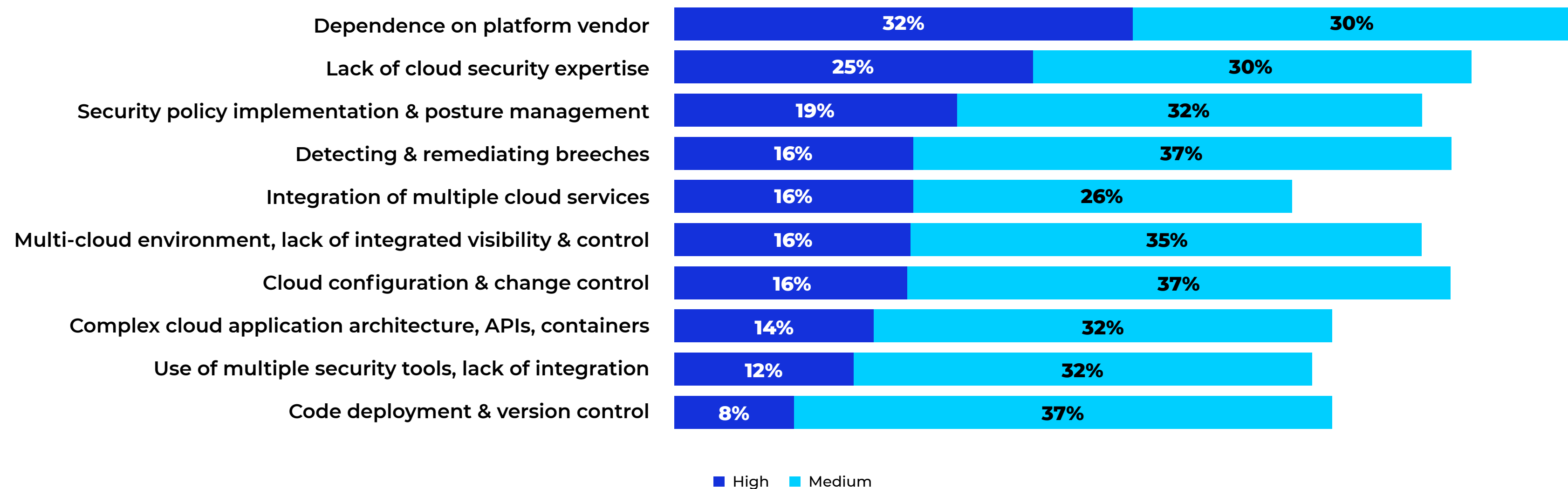
The top challenge related to cloud security amongst respondents is the dependence on platform provider (32%). Organizations inherently relinquish a certain level of control over infrastructure and security in the cloud with limited visibility into underlying measures and configurations. Without granular control, organizations may struggle to implement customized security controls that align with specific requirements and industry regulations.

Lack of cloud security experts (25%) is creating significant challenges not just in implementing policies and security posture (19%) but also in

integrating multi-cloud environment (16%) and configuration (16%). According to leading tech staffing firm in India, TeamLease, there is a 30% gap in the demand-supply for cyber security professionals.

Lack of skills is further complicated by the fact that cloud vendors have their own set of security tools, differing in functionality, ease of use, and integration capabilities which is hugely challenging for organizations leveraging multiple cloud vendors. It is also challenging to implement consistent security policies, centralized threat monitoring, and manage access and controls across systems.

## Challenges with Cloud Security



## What is the State of Defence?

Penetration testing is becoming a key pillar of strengthening cyber security to identify potential weakness before it is exploited. According to Trustwave, 98% of web applications have at least one vulnerability, most of which are publicly exploitable. Our survey finds organizations have implemented penetration testing with vigor (65%) and many are implementing it (22%) or have high in priority (10%).

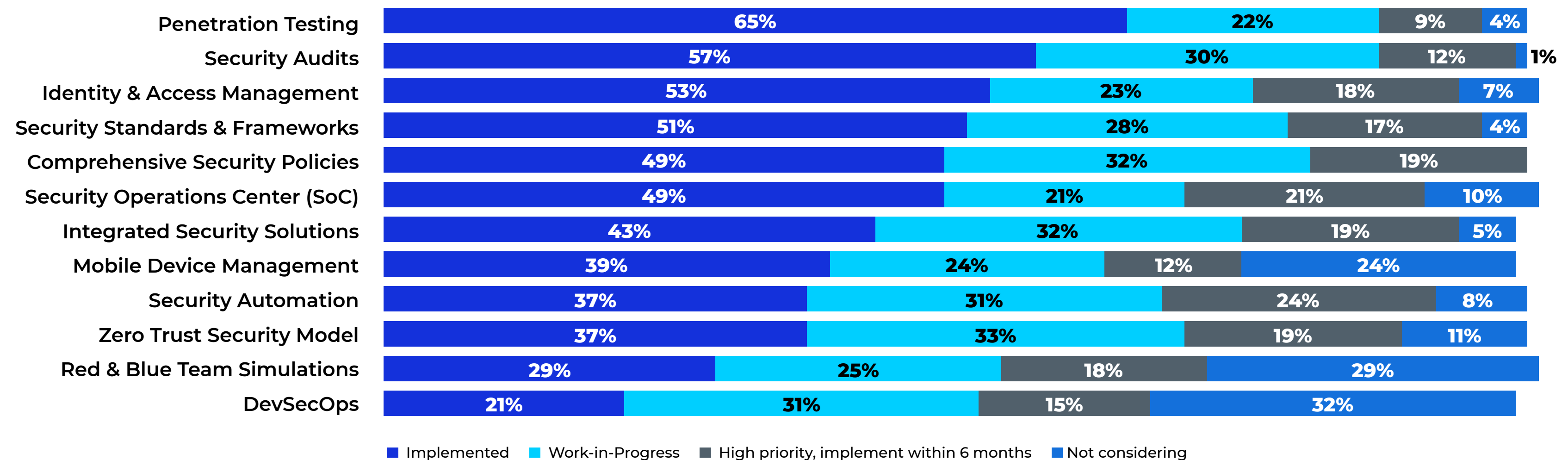
Security audits help to identify vulnerabilities and strengthen the security posture (57%). Conducting comprehensive security audits including network, access policies, data protection, employee awareness and incidence response systems empower

organizations to maintain a modern and up-to-date cyber security strategy.

Overall, Indian businesses have adopted several initiatives to shore up defenses. Some of the other activities include identity and access management (53%); adopting Security Standards and frameworks (51%); setting up a Security Operations Center (49%); and establishing comprehensive security policies (49%).

The Zero Trust model is catching up and 40% have deployed already, and 33% currently implementing; while DevSecOps has slow adoption with only 21% implemented; 31% work-in-progress and 32% not considering it.

## State of IT Security Processes







## Managing Cyber Security

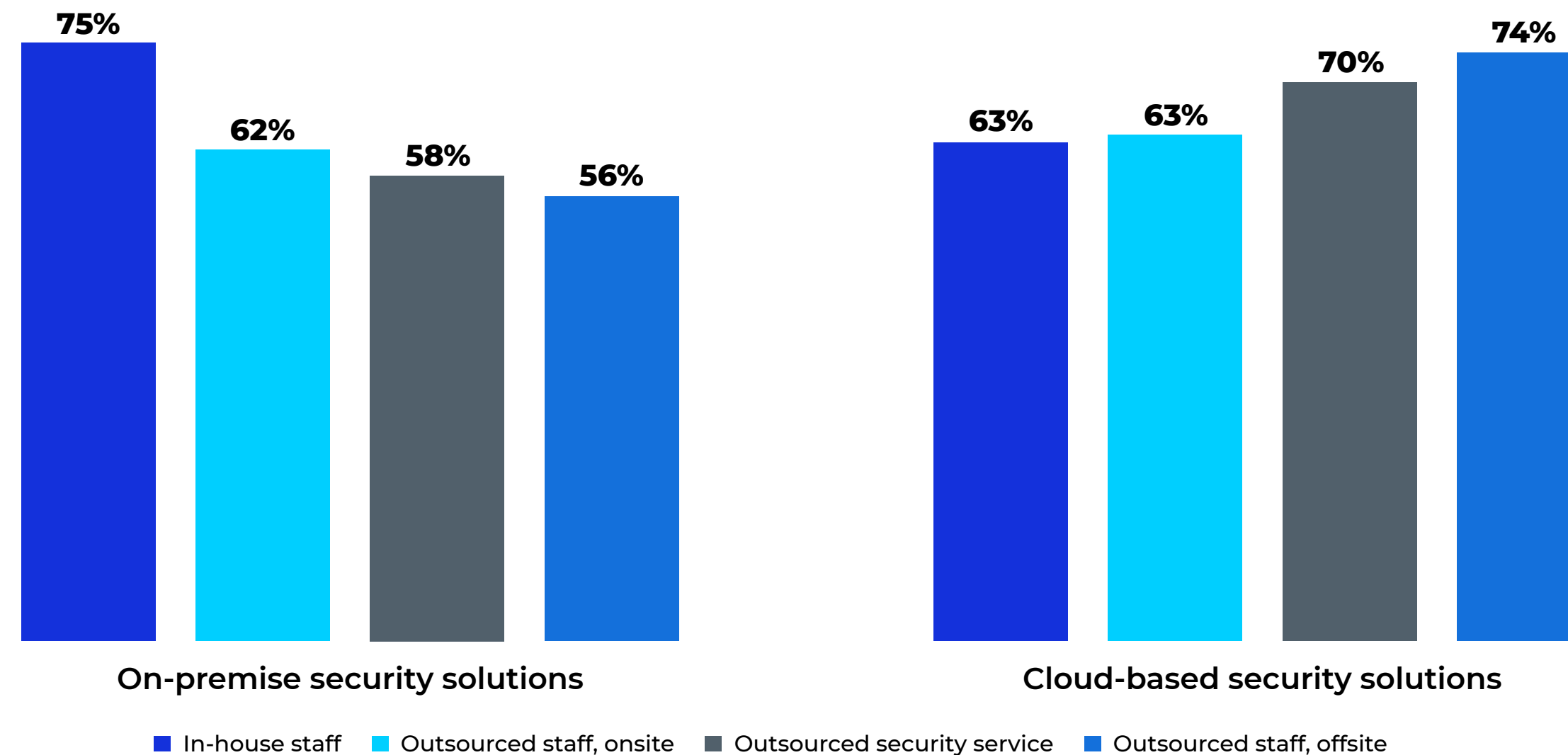
Indian businesses are employing a combination of approaches to implement, deploy and manage cyber security using on-premise solutions leaning on inhouse staff (75%) as well as cloud solutions which are managed by in-house staff (63%). At the same time, partners are playing a key role in achieving security objectives with associates both on-site and providing remote support.

Managing cybersecurity on-premise with in-house teams gives enhanced control, customization, flexibility, and agility. Internal expertise is necessary to achieve adaptability and responsiveness to combat

emerging threats. Indian businesses are discerning enough to weigh the advantages of in-house management such as the need to meet industry specific security and regulatory requirements; and confidentiality of critical assets.

Outsourcing cybersecurity include benefits such as accessing specialized skill sets and knowledge about latest tools and functionalities; 24x7 monitoring support; and having access to scalable resources. A smart strategy entails a combination of in-house expertise and relying on managed service partners who work as an extension of the in-house to achieve specific security goals.

### Current Deployment of Security Solutions



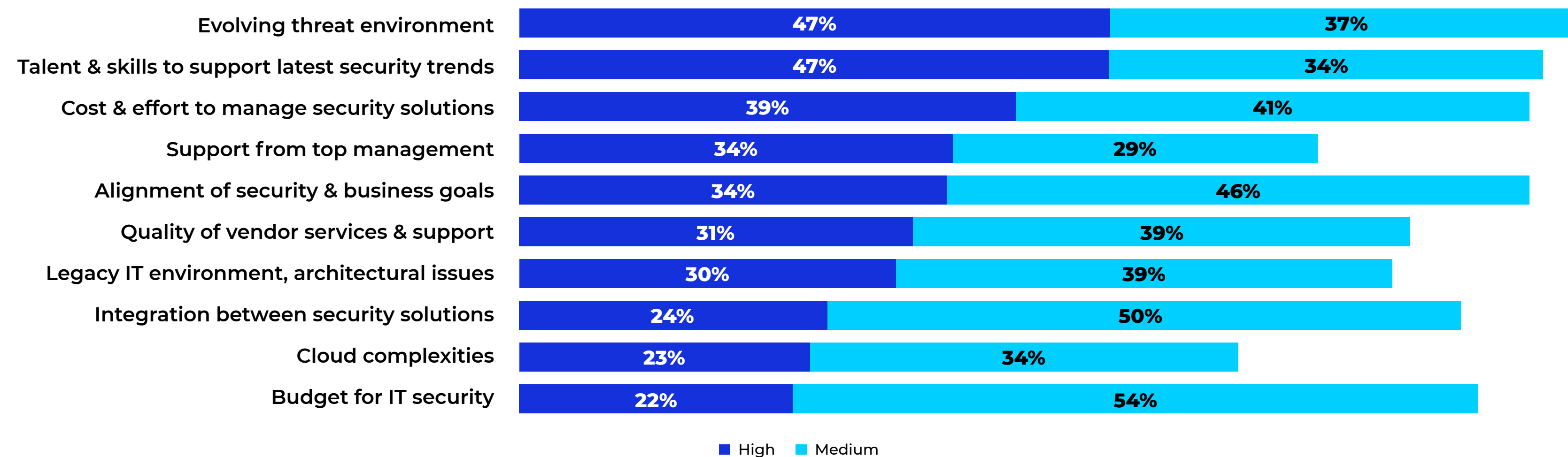
## Challenges in Achieving IT Security

The rapidly evolving threat environment (47%) and the shortage of skilled professionals (47%) are posing significant challenges in achieving robust IT security for organizations. Organizations are finding it difficult to keep pace with threat actors that are continuously adapting tactics with innovative social engineering, zero-day exploits and malicious techniques. Sophisticated cyber security attacks—including proliferation of ransomware-as-a-service where affiliates launch attacks using ransomware tools developed by skilled coders to earn a percentage—have become rampant, insidious and more deadly.

These complexities are pushing up the cost and efforts to manage security (39%) putting a lot of pressure on the security teams already battling budget issues (54%). Cost and budget have serious implications as organizations need to continuously invest in building capabilities with training, talent acquisition and partnerships to stay updated with technologies, attack techniques and defense strategies.

Misalignment between security and business goals (34%) create challenges wherein organizations are prioritizing short-term financial goals to compromise resource allocation for cyber security; manage with outdated security infrastructure and reluctant to invest in capability building.

## Challenges in Achieving IT Security Objectives



## Addressing the Skill Gap

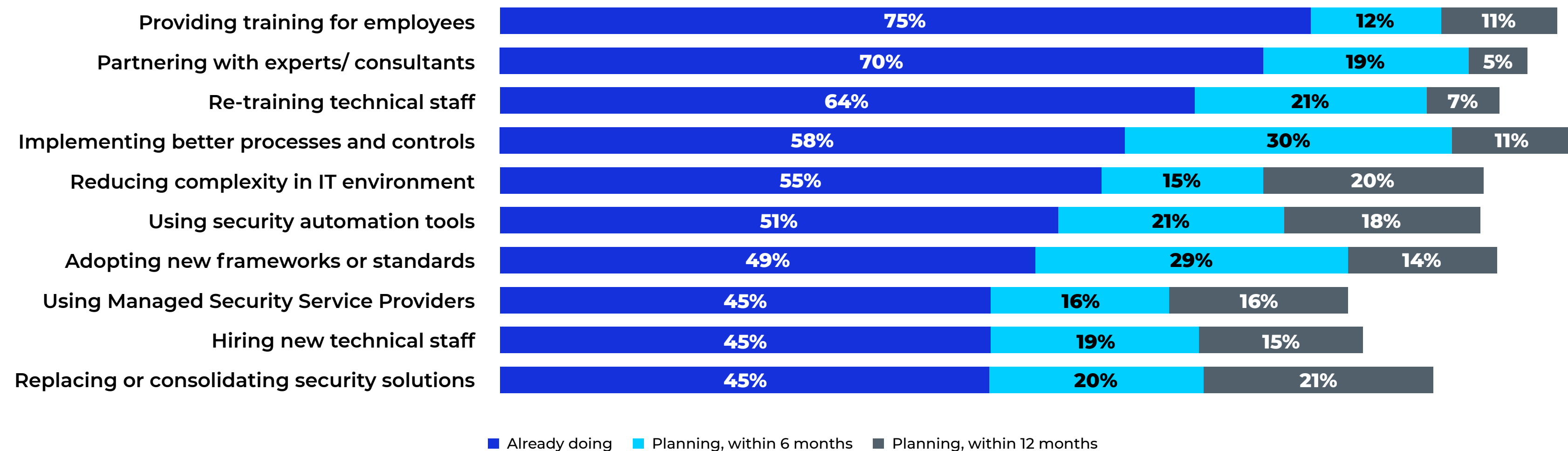
An overwhelming majority of organizations are recognizing the value of investing in employee training programs (70%) to strengthen the first line of defence. Cyber security training initiatives are aimed at creating awareness amongst employees on the importance of strong passwords, phishing awareness, secure browsing practices, and social engineering tactics. These activities promote shared responsibility for security, reducing the likelihood of human error leading to security breaches.

Organizations are re-training technical staff to address the skill gap (64%) to navigate the complex

cybersecurity landscape. Globally there is a shortfall of 3.4 million cyber security experts according to World Economic Forum. As the demand for skilled cybersecurity professionals outpace supply, organizations are also turning to partners to help bridge the gap (70%).

Organizations are streamlining internal systems and processes (58%) to strengthen security and this is a priority for many organizations in the next six months (30%) while adding an additional layer of defence with automation tools (21%) to monitor and prevent threats in the immediate future.

## Actions to Address Skill and Knowledge Gaps



# Key Contributors



**R. Giridhar**  
Group Editor  
B2B Tech  
9.9 Group  
[r.giridhar@9dot9.in](mailto:r.giridhar@9dot9.in)



**Balaka Baruah Aggarwal**  
Consulting Editor  
CIO&Leader  
9.9 Group  
[balaka.baruah@9dot9.in](mailto:balaka.baruah@9dot9.in)



**Jatinder Singh**  
Executive Editor  
CIO&Leader  
9.9 Group  
[jatinder.singh@9dot9.in](mailto:jatinder.singh@9dot9.in)



**Nisha Sharma**  
Principal Correspondent  
CIO&Leader  
9.9 Group  
[Nisha.Sharma@9dot9.in](mailto:Nisha.Sharma@9dot9.in)



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