dynatrace

Federal agencies identify top IT modernization challenges

Federal IT modernization survey

What's inside

Moving the mission forward with AI

Many Federal agencies are focusing on IT modernization to keep pace with the changing mission requirements and citizen demands. But one of the biggest modernization challenges program managers and mission owners face is time spent chasing problems rather than moving the mission forward. As a result, many agencies are looking to AI as the solution.

AI solutions can automate manually intensive troubleshooting and get missions back on track quickly. But despite these clear benefits, agencies are still not embracing these solutions.

Recent research surveyed Department of Defense (DoD) and Civilian agency IT mission leaders about the extent to which federal technologists and managers are aware of and have the need for application management services, their current efforts to incorporate new tools and techniques into their agencies, and their general attitudes toward using AI.

This survey found*:

- Respondents see APM as highly important, but don't have full visibility into their IT environment's status.

- Respondents see their APM solution as mature, but adoption of more advanced technologies is low.

- Agencies have challenges in management and visibility of complex IT environments, using resources for root cause analysis and resolution, and being reactive instead of proactive.

*Not all charts will total 100% There are three potential causes:
 1. Percentages are rounded (i.e. if two bars are 25.4%, both are rounded to 25%, but if added together, they'd round up to 51%)
 2. In cases of 'select all' questions, percentages can add up to more than 100%
 3. Unless there's a significant number, "other" percentages in questions will be supressed

Setting the landscape

Infrastructure type

Most workloads are in a private cloud and/or traditional data center environment.

57%

Private cloud
and/or data center

43%

Public cloud
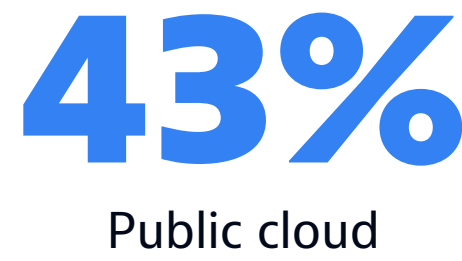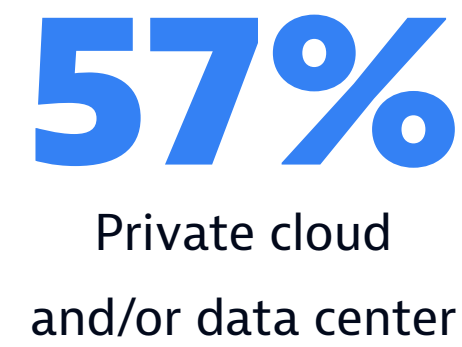
Federal cloud usage

51% of respondents indicate their organization currently uses a hybrid cloud.

51%
Hybrid

42%
Private

19%
Public

9%
Not using cloud
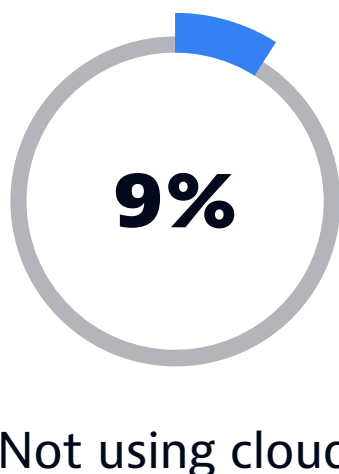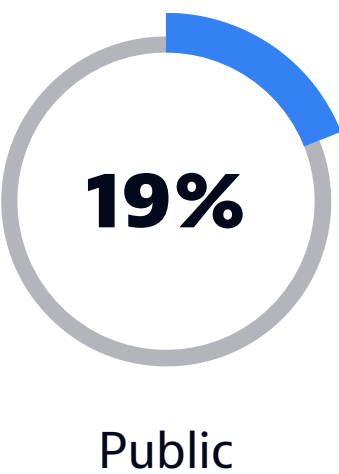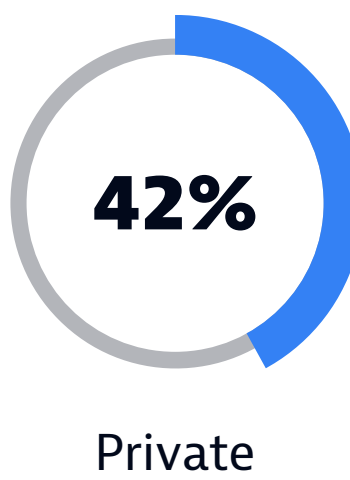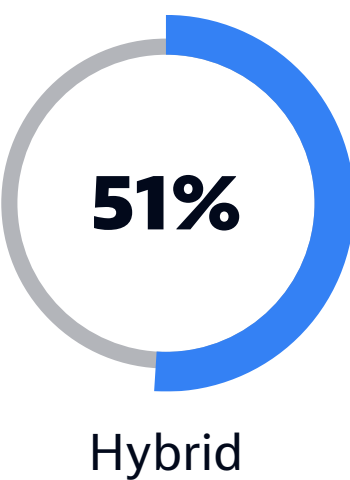
Federal cloud usage

Defense respondents outline the percentage of their portfolio in the cloud.

43%

of applications currently
in the cloud

58%

of applications in the cloud
over the next 12–18 months
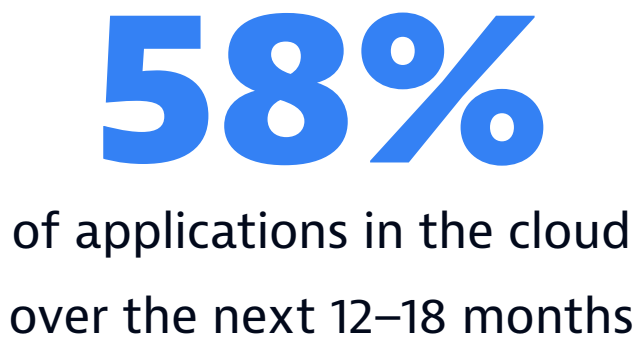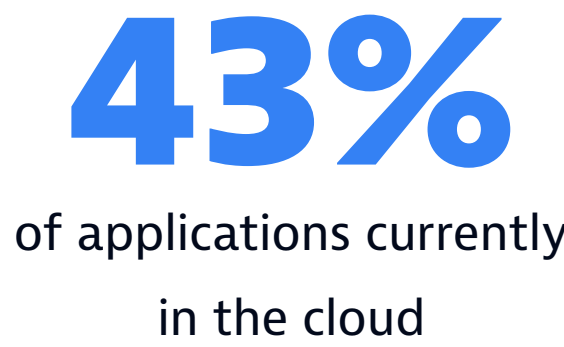
IT modernization plans and efforts

IT mission owners from DoD and civilian agencies cite the following factors
as helping their organization achieve its IT modernization plans and efforts.

42%	53%	44%	38%	42%	41%
50%	39%	46%	48%	44%	41%
8%	8%	10%	14%	14%	18%

Making use of advanced technologies (e.g., modernizing applications, updating legacy code, deploying hybrid cloud solutions, updating infrastructure)

Delivering services while reducing costs

APM

Digitizing current physical processes

Moving legacy applications to the cloud

Advanced analytics (including AI, machine learning, natural language processing)

■ Not at all/not very important   ■ Somewhat important   ■ Very important

Importance of technology capabilities for resource investment

Priority of AI investment is shockingly low (46%). How efficient can cloud migration be without AI? How sustainable is cloud computing without AI?

Agency interest in AI is not a fad. They understand the importance of AI for improving efficient use of tax dollars, decision-making, service delivery, citizen experience, and national security. However, agencies are in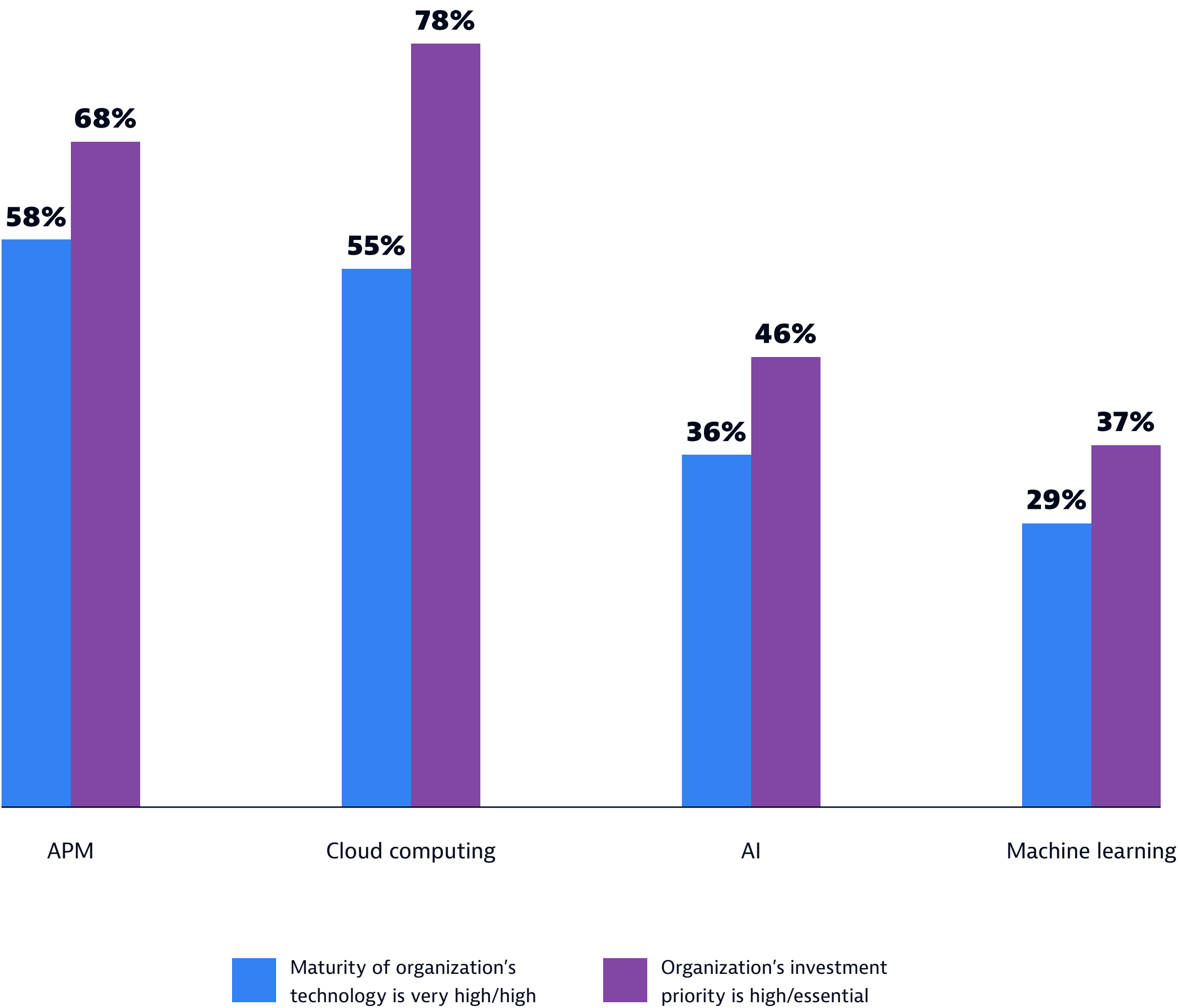 early AI adoption stages so investment is low. They are starting to assess best use cases and issues AI can address. Data is often not suitable or ready for AI utilization.

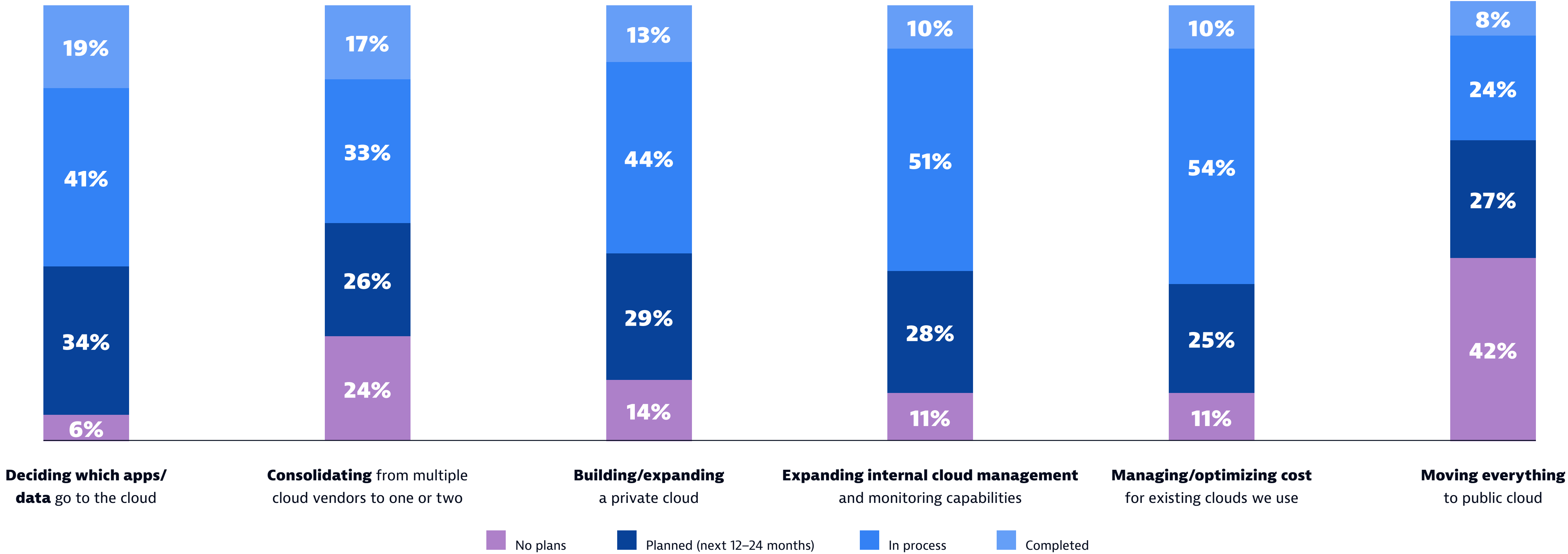**Trust is the biggest gap.** They question if people, processes and governance ready for AI and if they can trust answers AI provides, especially without human-readable understanding of the answer.

Legend:
- Maturity of organization's technology is very high/high
- Organization's investment priority is high/essential

Chart values:
- APM: 58% / 68%
- Cloud computing: 55% / 78%
- AI: 36% / 46%
- Machine learning: 29% / 37%

Steps taken to advance cloud strategy

Deciding which apps/data to migrate to the cloud is an action most likely already completed, with the majority of agencies planning to manage/optimize the cost for existing clouds and expand internal cloud management and monitoring capabilities. Research found 42% have no plans to move everything to the cloud.

However, those who do plan to move to the cloud said they will spend most of their time:

19%	17%	13%	10%	10%	8%
41%	33%	44%	51%	54%	24%
34%	26%	29%	28%	25%	27%
6%	24%	14%	11%	11%	42%

Deciding which apps/ data go to the cloud

Consolidating from multiple cloud vendors to one or two

Building/expanding a private cloud

Expanding internal cloud management and monitoring capabilities

Managing/optimizing cost for existing clouds we use

Moving everything to public cloud

- No plans
- Planned (next 12–24 months)
- In process
- Completed

Lessons learned speed cloud migration

After a decade of learning, agencies have a more deliberative process for choosing workloads to move to the cloud, driven by mission requirements.

Cloud migration compounds an already complex IT ecosystem by:

· Impacting access and control over underlying infrastructure

· Changing how security processes and policies are handled and managed

· Complicating quick problem indentification and response

AI-assisted analysis and visibility can greatly reduce complexity and mean time to remediation. Leveraging industry experience greatly lowers agency cost of AI entry.

White House Cyber Executive Order compels full observability

Agency cloud strategies will greatly benefit from "force-multiplier" platforms that enable deeper understanding of the increasing complexity needed to meet the Executive Order's mandate.

82%
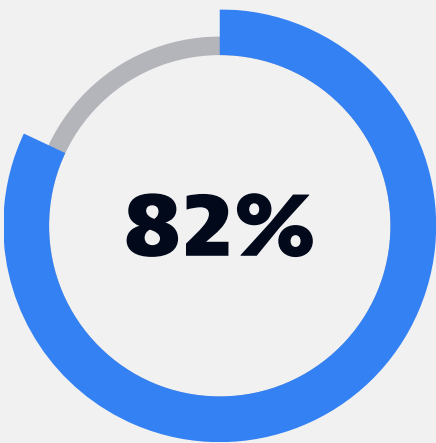
of respondents have heard of the Biden administration's executive order on improving the nation's cybersecurity.

84%
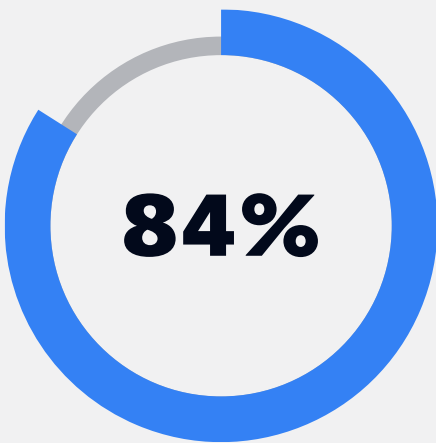
of those who have heard of the order are at least somewhat likely to use a platform to help discover application dependencies.

Challenges

Agencies have challenges in management and visibility of complex IT environments, using resources for root cause analysis and resolution, and being reactive instead of proactive.

Moving applications to the cloud

Multiple steps are taken in order to determine and prioritize
which applications are moved to the cloud. These include:

66%

61%

57%

53%

41%

Monitor performance issues
before, during, and after migration

**Ensure the app is
well-suited** for cloud

Analyze impact
on end-user

Map applications, their inter-relations,
and dependencies before migration

Analyze code to ensure
no errors reach production
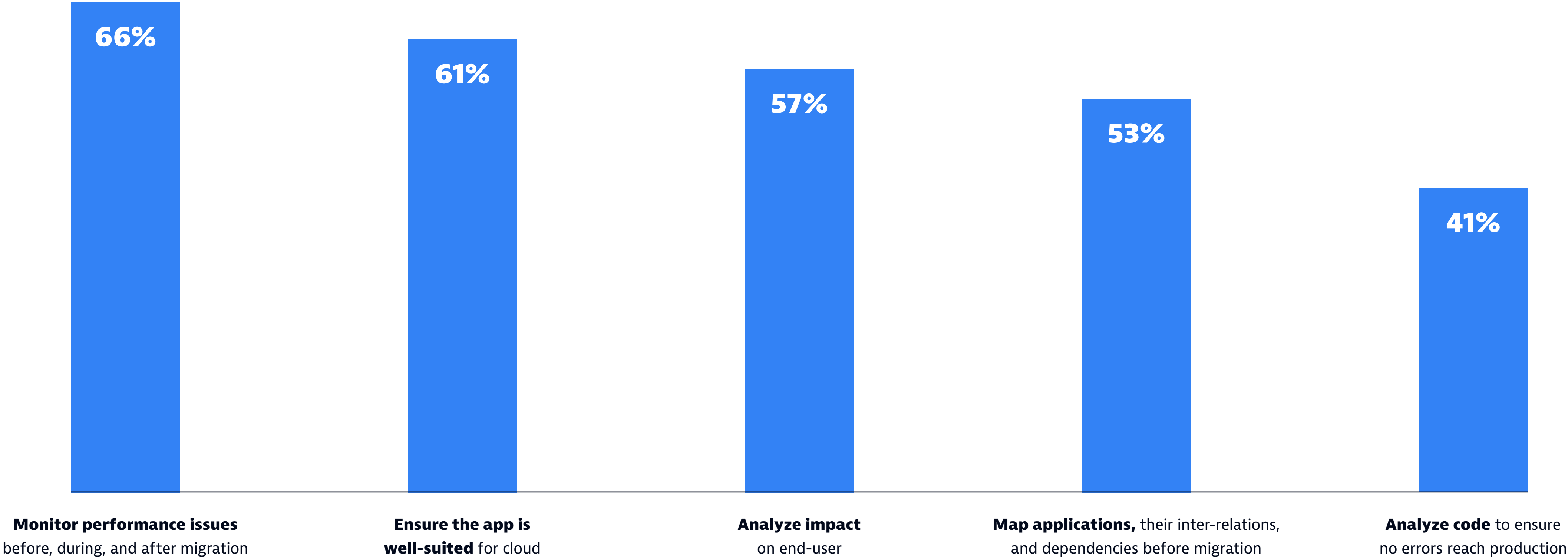
Expanded cloud usage benefits include:

71%

51%

48%

47%

47%

45%

42%

41%

Connectivity
of remote
offices/personnel

**Streamlined
operations**

**Cost
savings**

Helps organization
meet its mission goals

**Improved
application
performance**

**Increased
productivity**
of IT staff

Improved
compliance

Ability
to **innovate more**
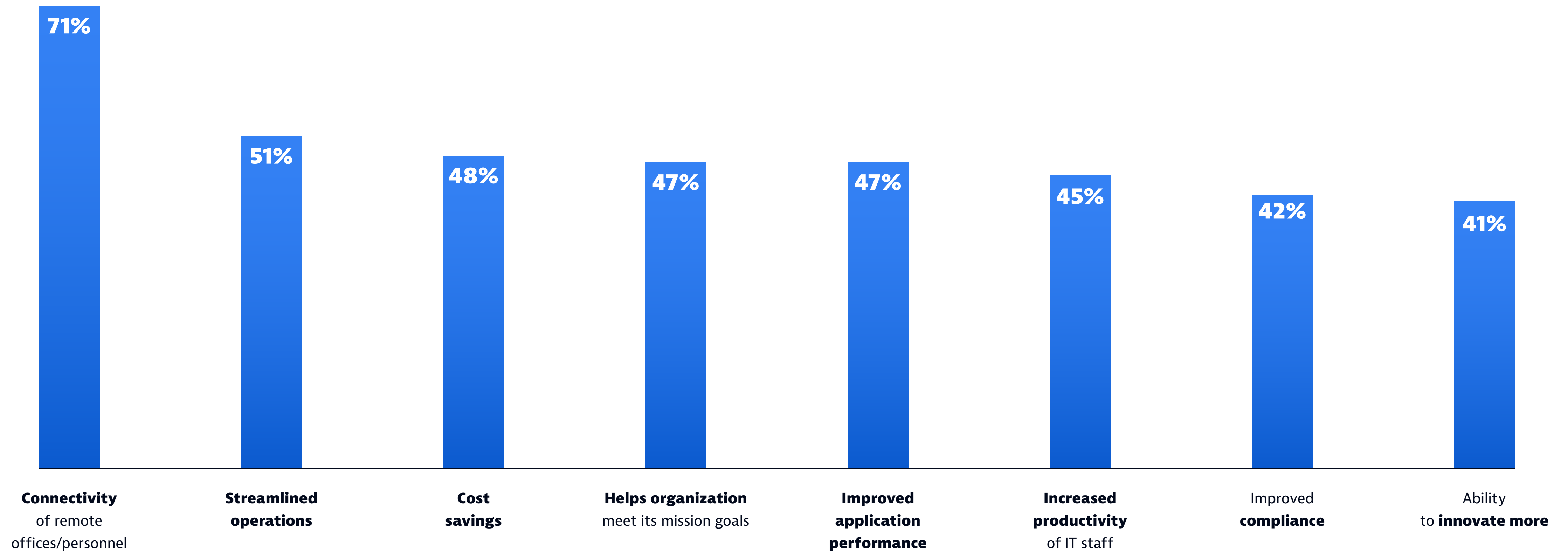
Challenges to expanding cloud usage include:

Security concerns	Budget limitations	Risk aversion	Data privacy/ ownership	Applications not cloud-ready	Complexity of internal environment	Competing priorities/ other initiatives	Buy-in from management in cloud adoption	Resources to implement cloud capabilities	Application performance	Lack of visibility into the entire IT environment
64%	51%	44%	39%	36%	36%	35%	27%	23%	22%	14%

Expanded cloud usage benefits and obstacles

Past cloud migration efforts were often greatly underestimated. With Cloud Smart, migration methods now focus on getting the right data and resources closer to the user.

Almost half (48%) say cost savings is a big cloud benefit, but 51% say budget is an obstacle. While these seem to be at odds, there can be significant long-term cost efficiencies and security benefits when cloud adoption is done right and systems normalize.

Security can be another concern. The difference between on-premises and cloud limits use of established policy and procedure. With cloud, agencies give up a certain level of control over policy and procedure.

IT managers face ongoing challenges

The biggest challenges agencies experience are using resources to detect and correct root causes, and being reactive to problems instead of proactively identifying issues.

With regard to management of application performance issues, **most respondents (56%) look at issues on a post-mortem basis,** instead of proactively preparing.

The benefits of AI and observability are to mitigate all of these challenges — which provides cost savings by default.

IT managers cited the following areas as challenges:

79%
Root cause detection and correction

78%
Management and visibility of complex IT environments

77%
Being reactive to problems rather than proactively indentifying issues

75%
Only hearing of a problem once an end-user notifies the IT team

70%
Manual problem detection

70%
Having no visibility into the root cause once a problem is detected

67%
Lack of visibility across the full IT stack, including all dependencies

66%
Conflicting data from different monitoring tools

Limitations in cloud monitoring approaches

AI-driven observability mitigates issues like lack of resources. For instance, with root cause discovery and remediation, AI can do in a few minutes what would take a team of people hours, weeks or more — allowing them to focus on the mission.

Agencies can at least partially address many limitations by incorporating AI-powered observability into their cloud monitoring strategy — it's a force multiplier without the cost of adding headcount.

Almost two-thirds (65%) of respondents see AI as valuable to modernization efforts, but 32% don't trust it — likely why overall AI investment isn't seen as essential according to respondents. Bridging the trust gap is critical to reaping the benefits of AI, like eliminating time wasted on repetitive, tedious tasks. Any AI platform an agency uses should contain explainable AI — models represented in an easy-to-understand human readable format, not a black box.

Respondents say they are most limited by :

59%
Budget contraints

50%
Lack of resources dedicated to monitoring

48%
Lack of staff expertise on APM

33%
Lack of leadership buy-in

30%
Insufficient compatibility within existing systems

26%
Lack of alignment of current tools

25%
Difficulty of identifying cost-efficient solutions

24%
Too many touch points to monitor

24%
Insufficient or inflexible reporting

20%
Difficulty tracking operational metrics with current provider

15%
Difficulty in prioritizing where to begin implementing an APM solution

SECTION 3

Moving forward: Solutions

One of the biggest modernization challenges program managers and mission owners face is time spent chasing problems rather than moving the mission forward. AI is the solution: Adopting AI-based observability frees teams to focus their time on accelerating mission innovation.

AI solutions can automate manually intensive troubleshooting and get missions quicky back on track.
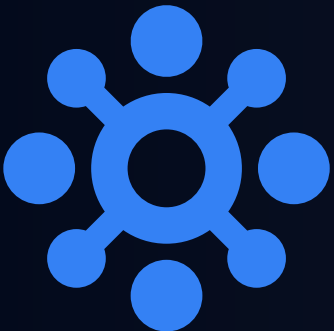
The importance of monitoring and visibility

Only 11% rate the ability to track, monitor, and report on assets as "critical" to their organization's IT modernization plans and efforts. While 60% say it's "very important", the potential mission impacts of not having full visibility should make that closer to 100%.

Imagine if our car dashboards only gave us fuel consumption or average speed at the end of a trip, we'd be in trouble! Agencies should look at the visibility into their most critical systems the same way. Continual, detailed status information is essential.

On a scale of 0–100, 0 being no visibility and 100 full visibility respondents felt they were only at 64 in overall visibility of their entire IT environment.

The ability to track, monitor, and report on assets is:

11%
Critical

59%
Very important

29%
Somewhat important

1%
Not at all important/
not very important

70% rate the ability to track, monitor and report on assets as critical/very important.

Visibility on performance

It's impossible to track, monitor, and report without full visibility. Respondents rated visibility on a sliding scale of 0-100, 0 being no visibility, 100 being complete visibility. They have the most visibility into network (70) and operating system performance (71), and the least on virtual machines (60) and cloud instances (62).

Category	Value
Network	72
Operating systems	71
Servers	69
Databases	67
Applications	65
Cloud instances	62
Virtual machines	60

No visibility

Full, end-to-end visibility
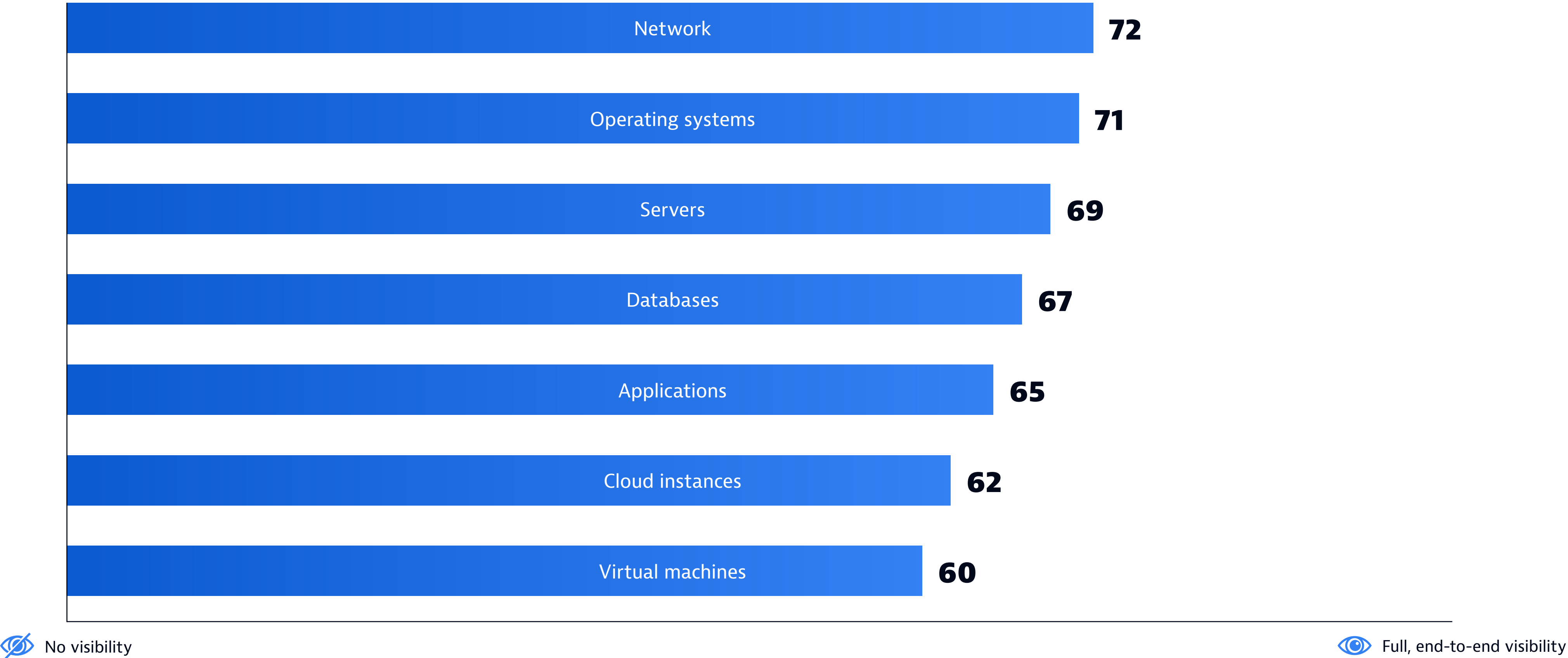
Legacy APM tools are not sufficient for today's mission

With hundreds of apps and millions of dependencies:

· How are agencies determining what to move to the cloud?

· What process was used?

· How were dependencies mapped?

· How were baselines of the applications and performance characteristics gathered?

· How was successful migration ensured?

APM tools help determine best-move candidates and dependencies. But only one third (35%) of respondents use any APM tools. Agencies are likely using legacy tools that provide some dependency and network mapping, but lack the more advanced AI, root cause analysis and automation.
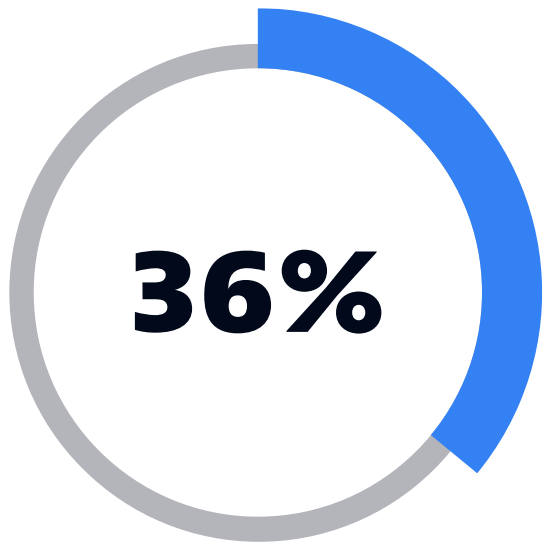
As agencies continue their migration to the cloud it will be necessary to replace these legacy tools with next-generation AI-driven observability platforms.
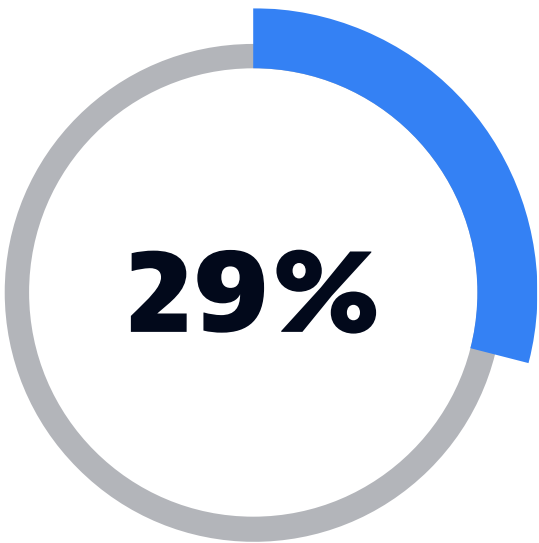

38% Unsure **35% Yes** **26% No**
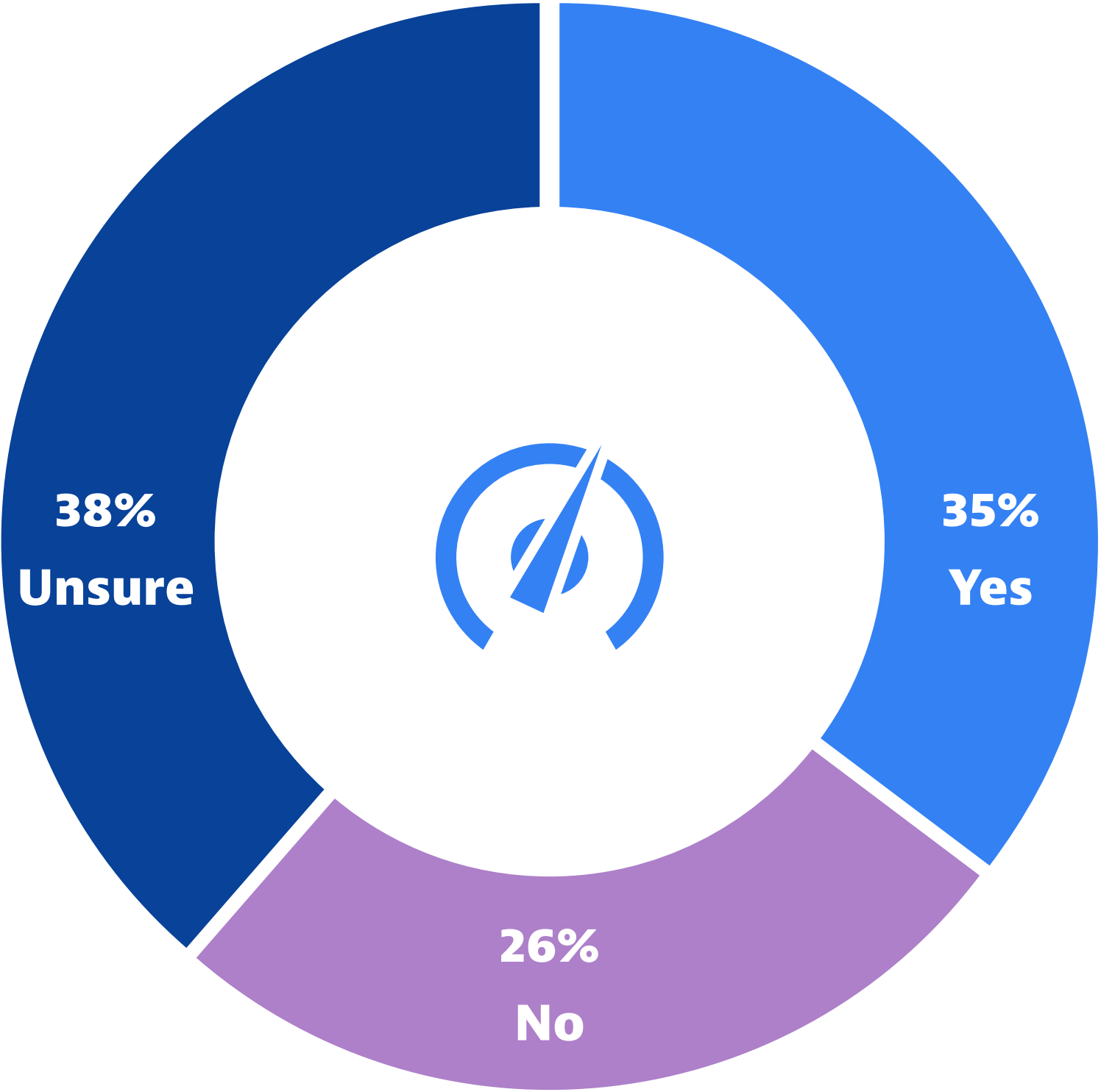
Does your organization currently use any APM tools?

Where APM tools run

Do you run the APM tools
in the cloud, on-premises, or both?

36%

In cloud and on-premises

29%

On-premises

23%

In the cloud

11%
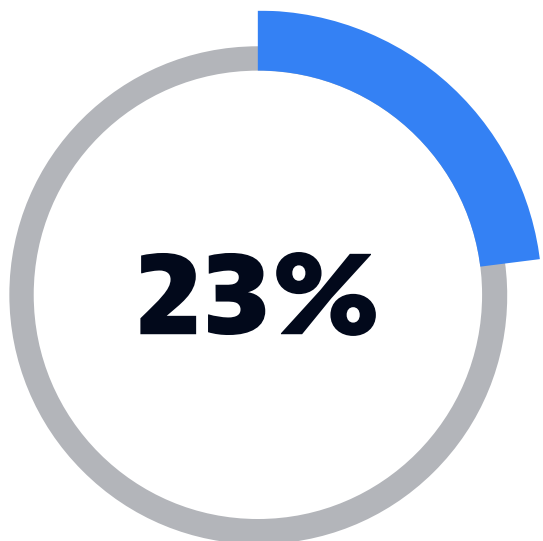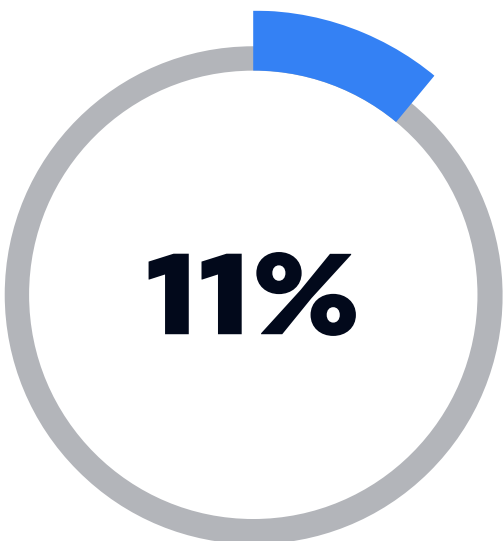
Does not matter

Importance of certification validations

Our respondents cited the following
certification validations as most important:

95% Common Criteria

89% FIPS 140-2/3 Validated

89% Existing agency or reciprocating agency
Authority to Operate

74% FedRAMP (Lisaas, low, moderate or high)

70% DoDIN APL

Benefits of cloud monitoring tools

Respondents cited the biggest benefits of cloud monitoring tools as more timely awareness
of real-time issues followed by increased visibility into current IT configurations, and others including:
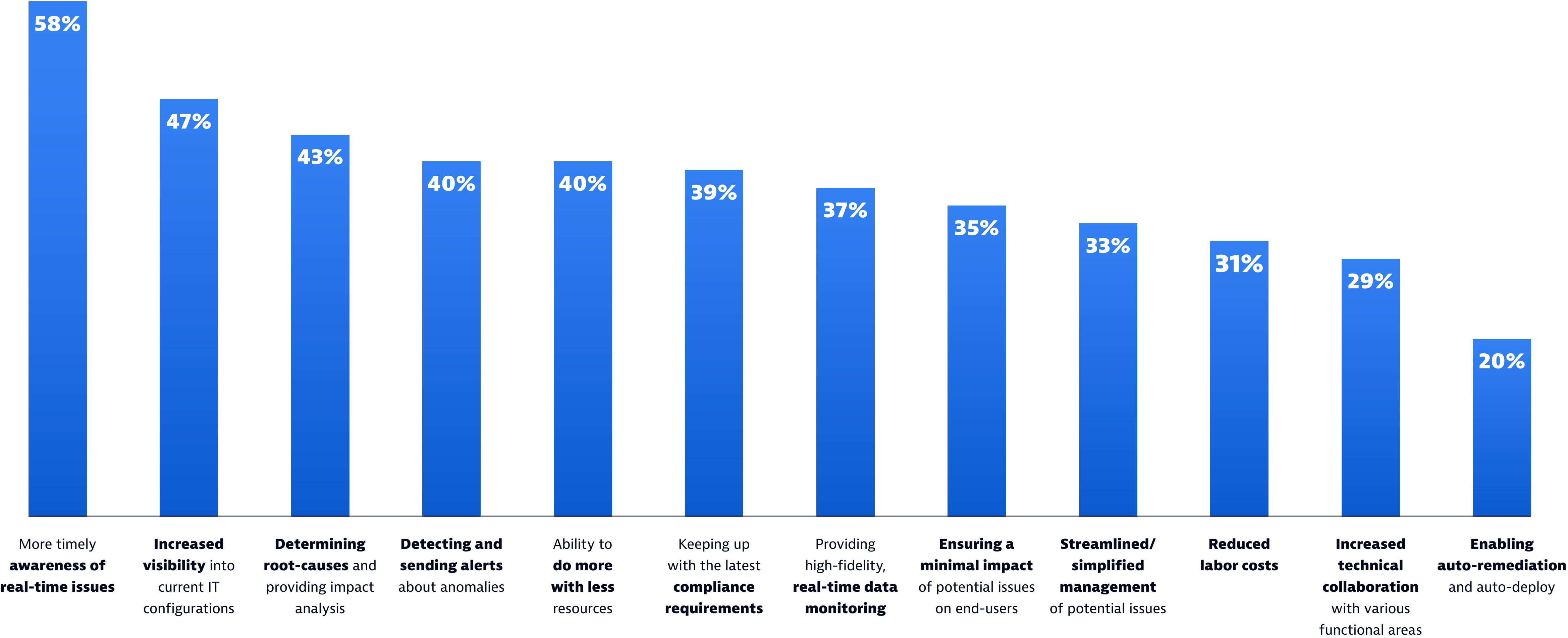
58% — More timely **awareness of real-time issues**

47% — **Increased visibility** into current IT configurations

43% — **Determining root-causes** and providing impact analysis

40% — **Detecting and sending alerts** about anomalies

40% — Ability to **do more with less** resources

39% — Keeping up with the latest **compliance requirements**

37% — Providing high-fidelity, **real-time data monitoring**

35% — **Ensuring a minimal impact** of potential issues on end-users

33% — **Streamlined/ simplified management** of potential issues

31% — **Reduced labor costs**

29% — **Increased technical collaboration** with various functional areas

**20%** — **Enabling auto-remediation** and auto-deploy

Application monitoring management tools

Respondents listed the main benefits to the APM tool(s) they use as:

51% Real-time dependency knowledge and full-stack coverage

48% Ability to map your entire environment from most legacy (mainframe) to most modern (containerization)

42% Dynamic cloud environments in which there is no time to "learn"

36% Automated configuration vs. manual

21% Automatic root cause analysis covering the entire app ecosystem

APM limited to services provided by host

- 50%
- 25%
- 25%
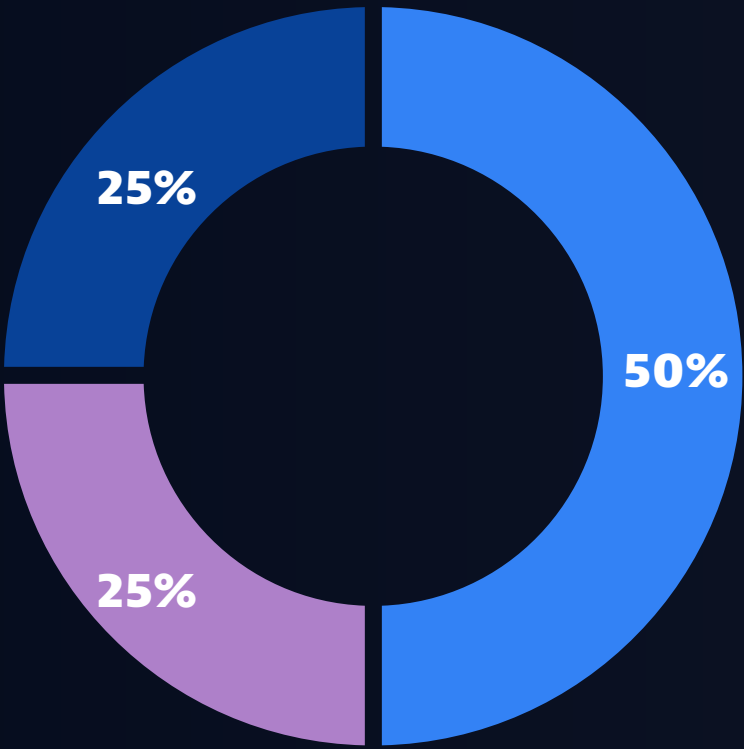
Network topology mapping restricted to platform native components

- 48%
- 26%
- 25%
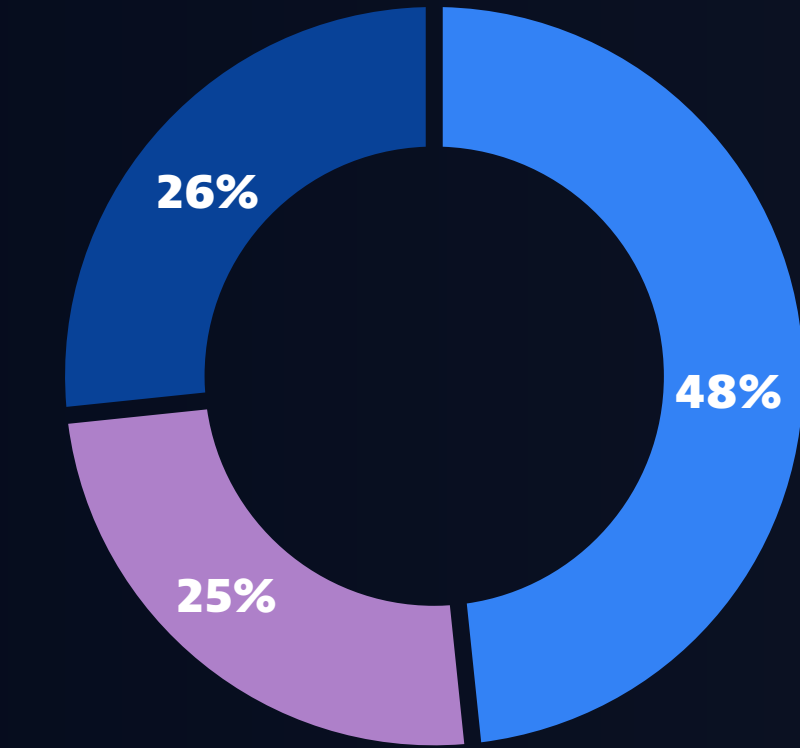
■ Yes ■ No ■ Don't know/unsure

AI as the foundation of modernization

Just over a quarter (28%) of respondents feel AI is critical/very valuable to modernization efforts. However, modernization without AI will be extremely difficult at best. Remember, as we move to the cloud, modernize our applications, and utilize cloud-native technologies complexity will skyrocket. You must have AI to tackle this complexity.

How valuable is AI to your organization's modernization efforts?

26%
Very valuable

38%
Somewhat valuable

26%
Not very valuable

8%
Not at all valuable

2%
Critical

28%
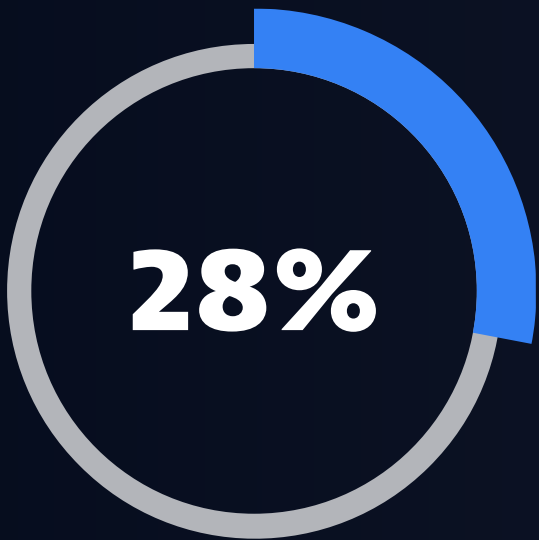
of respondents feel AI is critical/very valuable to modernization efforts

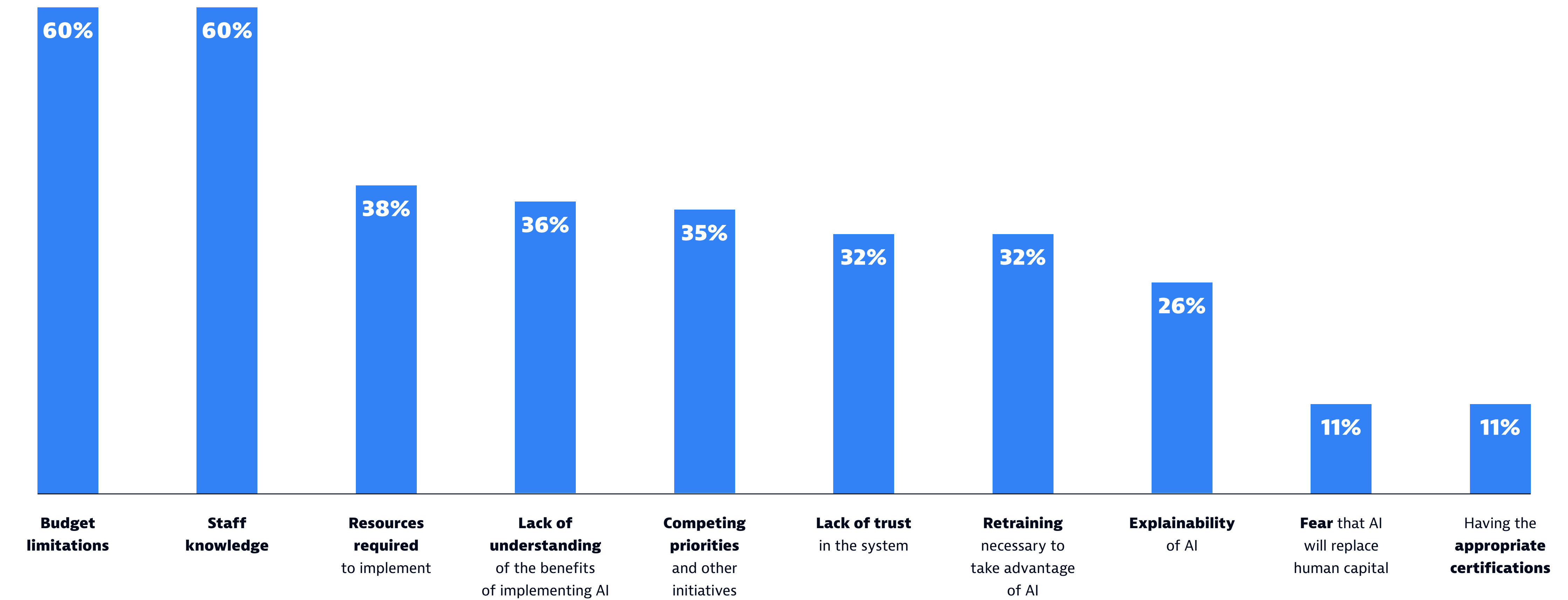# Obstacles to expanding the usage of AI

The biggest obstacles to expanding AI usage cited by respondents
are staff knowledge (60%) and budget limitations (60%), amongst others:

60%	60%	38%	36%	35%	32%	32%	26%	11%	11%
Budget limitations	**Staff knowledge**	**Resources required** to implement	**Lack of understanding** of the benefits of implementing AI	**Competing priorities** and other initiatives	**Lack of trust** in the system	**Retraining** necessary to take advantage of AI	**Explainability** of AI	**Fear** that AI will replace human capital	Having the **appropriate certifications**

Observability

"Observability" is a misunderstood term. In IT and cloud computing, observability is the ability to measure a system's current state based on the data it generates, such as logs, metrics, and traces.

What agencies need to know is that **observability is the next generation of APM,** designed to give end-to-end visibility of all applications and components, but adding a layer of automation to address today's complex, dynamic environments. AI-based observability collects, analyses, predicts, finds root cause, and extends all the way to the end-user.

Observability is the ability to measure a system's current state based on the data it generates, such as logs, metrics, and traces.

Respondents describe their familiarity with the term "observability"

12% heard of it, very familiar with it.	**50%** have heard of it and are somewhat familiar with it.	**26%** have heard of it but are not sure what it is.	**12%** have never heard of it.

88% have at least heard the term "observability" (but have various definitions).

Key Takeaways

Advanced analytics and AI can mitigate the biggest challenges agencies face

- Issue root cause

- Management and visibility of complex environments

- Reactive vs proactive

Agencies see the need for advanced analytics

8 out of 10 believe the following activities are important in helping achieve agency modernization:

- Advanced analytics

- Making use of advanced technologies

- Delivering services while reducing costs

Agencies are hesitant to trust AI

- Nearly one-third of respondents cite lack of trust in the systems as a barrier to implementation.

- Nearly two-thirds say staff knowledge of AI systems is a barrier.

Trust in AI requires a system that is:

- **Transparent.** AI decisions follow a deterministic approach powered by a causal graph that discovers and updates in real-time.

- **Explainable.** They can see a complete set of circumstances leading up to any decision the AI engine makes.

- **High data that provides answers.** Supplying a precise known state of how everything across the stack operates means the AI is working with good data. With root-cause analysis and problem playback, resolution can happen in minutes.

The Dynatrace difference

Dynatrace provides software intelligence to simplify cloud complexity and accelerate digital transformation. With automatic and intelligent observability at scale, our all-in-one platform delivers precise answers about the performance and security of applications, the underlying infrastructure, and the experience of all users to enable organizations to innovate faster, collaborate more efficiently, and deliver more value with dramatically less effort. That's why many of the world's largest enterprises trust Dynatrace® to modernize and automate cloud operations, release better software faster, and deliver unrivalled digital experiences.

Why Dynatrace is radically different:

Automatic

AI continuously analyzes your environment and reports on what is happening, the business impact, and the detailed cause; a virtual team telling you what is most important

Continuous automation

Explainable AI engine, Davis®, built into the core of the Dynatrace® platform, processes billions of dependencies for instantly precise answers, prioritized by business impact and with root-cause determinization.

Intelligent observability

100% metrics, logs, and traces, with much more: entity relationships and topology, code-level detail, user experience, behavioral data, all connected and in context.

Cross team collaboration

A single platform based on a single data model with answers for dev, and ops that provides a common language and removes miscommunication and friction between teams for faster decisions and response.

Methodology

Market Connections, Dynatrace, and W2Communications partnered to design an online survey of 300 federal government employees (split 50/50 between Civilian and Defense), fielded in August – September 2021.

The primary objectives were to determine:

- The extent to which federal technologists and managers are aware of and have the need for application management services

- Where agencies are at in their IT modernization efforts

- The pain points related to modernization, development and security of overall systems

- Current efforts to incorporate new tools and techniques into their agencies

Respondent classification

Sample was composed of 300 Federal government employees

(50% Civilian agency and 50% Defense agency)

Agencies Represented		
Treasury	HHS	Veterans Affairs
GSA	Labor	Education
GAO	CFPB	Navy
DHS	Justice	State
FAA	Agriculture	Energy
Federal Mediation & Conciliation Service	Army	Marines
Transportation	Commerce	Interior
NOAA	HUD	IMLS
FDIC	Air Force	Intelligence Community

Respondent classification

Respondents were screened to ensure they were involved in either the selection
or management of firms that provide technology services to the federal government.

In which of the following ways are you involved in your organization's selection of firms that provide technology services to the federal government?	
Initiate project requirements	49%
Identify potential firms	62%
Evaluate bids	56%
Recommend firms and/or bids	56%
Have final approval	22%

In which of the following ways are you involved in your organization's management of these firms once they have been hired or selected?	
Routine interaction to accomplish work	68%
Management of programs or projects	55%
Review for final deliverable	47%
Executive level oversight of programs or projects	16%

Which of the following best describes your job role/ function in your organization?	
IT/MIS/IRM	37%
Program/project management	23%
Administration/Operations	19%
Executive management/command	8%
Engineering	7%
Technical services	5%

Which of the following best describes your role in your organization?	
Mission-focused (Agency-specific functions, e.g., warfighter, law enforcement, air traffic control)	43%
Operations (Internally-focused functions, e.g., HR, recruitment, benefits, finance & accounting, audit & compliance)	57%

Automatic and intelligent observability for hybrid multiclouds

We hope this ebook has inspired you to take the next step in your digital journey.

Dynatrace is committed to providing enterprises the data and intelligence they need to be successful with their enterprise cloud and digital transformation initiatives, no matter how complex.

Learn more   If you are ready to learn more, please visit www.dynatrace.com/platform for assets, resources, and a **free 15-day trial.**

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About Dynatrace

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 blog   **@dynatrace**