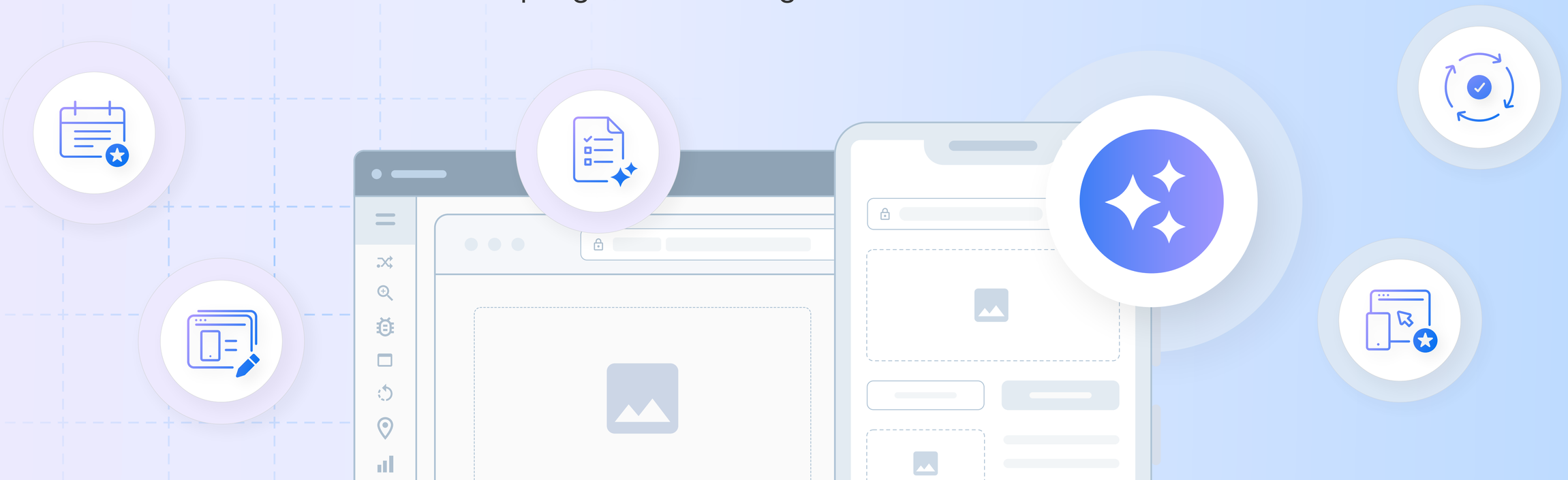
BrowserStack

The State of AI in Software Testing in 2026

How software teams are increasing efficiency and adapting QA and testing workflows with AI



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FOREWORD

AI-powered testing has evolved from experiment to infrastructure

Over the past two years, nearly every conversation I've had with engineering leaders has touched on the same question: "How do we actually make AI work for testing?" Not whether AI matters, that debate is over. The real questions are tactical: Which tools deliver results? How do we integrate them without disrupting existing workflows? What skills do our teams need? And perhaps most importantly: Is the investment worth it?

We commissioned this research because we wanted answers grounded in reality, not hype. We surveyed more than 250 software testing professionals across four countries to understand what's actually happening in testing organizations today.

The findings reveal both opportunity and urgency. Organizations using AI strategically are seeing remarkable returns, while those hesitating risk falling behind. But success isn't about adopting every AI tool available. It's about understanding where AI amplifies human judgment rather than replaces it.

Whether you're just beginning your AI journey or scaling existing implementations, this research offers a practical roadmap grounded in real experiences from testing teams navigating the same challenges you face.

Nakul Aggarwal
Co-founder and CTO of BrowserStack

> "Building software is hard. Testing it shouldn't be."
>
> **Nakul Aggarwal** *Co-founder and CTO of BrowserStack*

INTRODUCTION

The AI testing revolution

AI is no longer an experimental technology, it's a key part of software testing and development. As AI becomes table-stakes, testing teams have sought resources on what tools to adopt, how to integrate them, how much budget to allocate, and how their teams must evolve to automate more testing.

We surveyed more than 250 software testing leaders including CTOs, VPs, Engineering & Testing heads across the globe to gather insights on how testing teams are handling AI today.

Read on to discover how testing professionals are using AI today, their top benefits and challenges, and their predictions for the future.

Here are some of the key findings

1. **AI adoption is now widespread in software testing.**
   61% of organizations use AI across most testing workflows.
2. **We're in a rapid scaling phase in AI testing.**
   43% of teams have used AI for 1-2 years and 64% expect to increase AI budgets by 11-25%.
3. **The #1 use case for AI is automated test case generation.**
   42% of leaders are addressing or looking to address automated test case generation with AI in software testing.
4. **The most-adopted AI technology is LLMs.**
   65% of software teams use LLMs like ChatGPT, Claude, Gemini, and Perplexity.
5. **The top implementation challenge is integration with existing tools.**
   Over one-third of software teams say their top challenge in adopting AI in software testing is integrating with current tools.
6. **Automated testing workflows are still in early days.**
   Only 8% of companies have achieved 81-100% test automation, demonstrating significant room for growth.
7. **AI is a strong investment for testing teams.**
   46% report 51-100% ROI from AI testing, with an additional 18% seeing over 100% ROI.
8. **AI is changing software testing role requirements.**
   50% expect QA professionals will need AI upskilling.

LANDSCAPE

The current state of AI adoption in software testing

The vast majority of organizations have meaningfully incorporated AI into their test cycles.

There's no one correct way to use AI—in some organizations, it makes sense to incorporate AI across most of the testing process, but in others, a smaller implementation is more effective. Successful teams understand where AI can deliver the most value and how to integrate it into their existing processes to realize that value.

What's clear is that organizations that plan to avoid AI altogether are in a tiny minority, who now risk being left behind. And large enterprises (10,000+ employees) are taking a more focused approach to AI adoption than smaller companies—they're less likely than all companies surveyed to use AI across most testing workflows, but more likely to use AI for select use cases.

61%

Companies that use AI across most testing workflows

32%

Companies that use AI for select use cases

5%

Companies that are exploring or pivoting to AI

1%

Companies that have no plans to use AI

LANDSCAPE

AI in software testing is seeing recent and rapid adoption

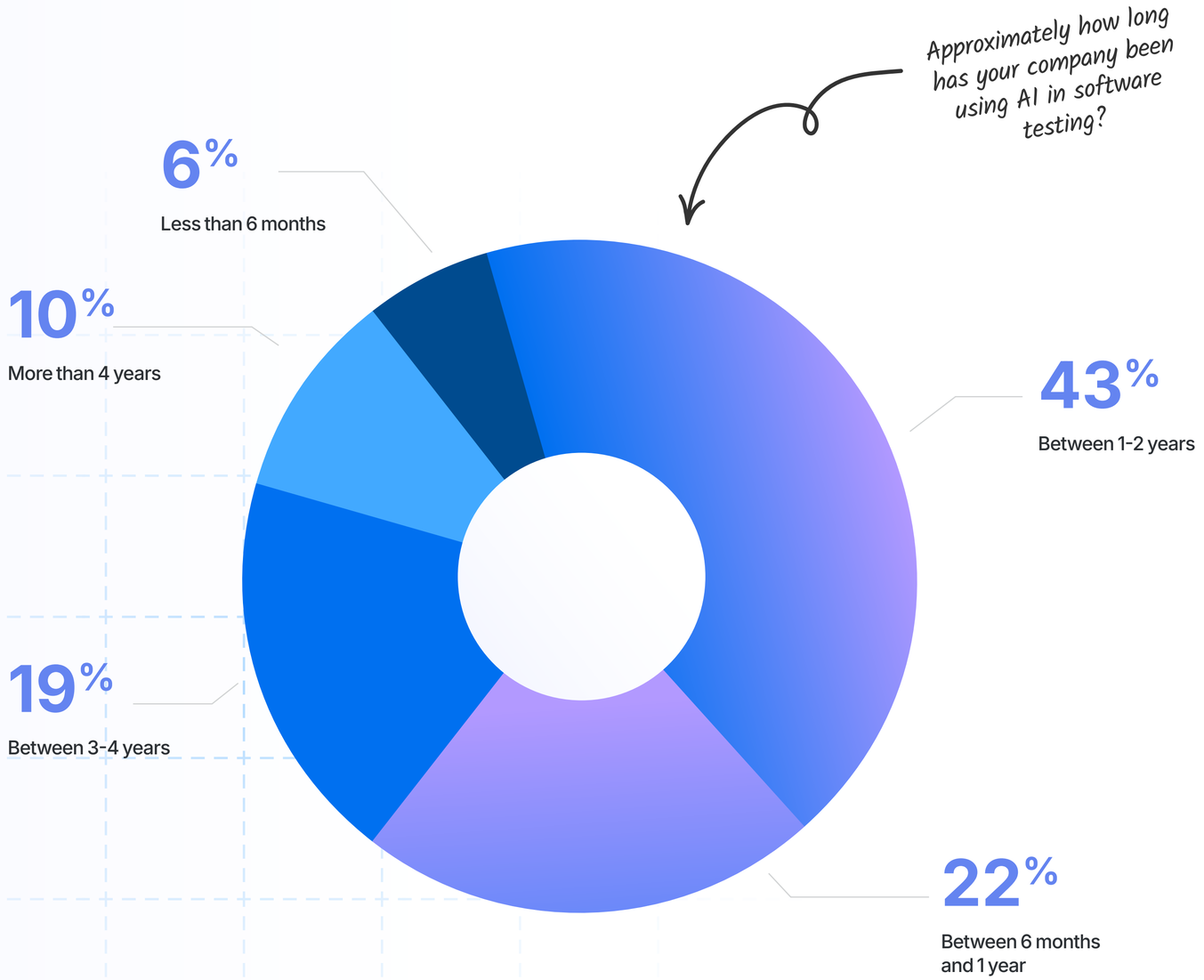
94% of teams have used AI in testing for at least 6 months, and there's been a recent but rapid adoption phase across the market. Large enterprises are 150% more likely to have used AI in testing for more than 4 years compared to all companies surveyed.

Regionally, the US and UK lead in comprehensive adoption of AI—64% and 63% of American and British organizations use it across most testing workflows, in comparison to 54% of mainland European organizations.

94%

of teams

have used AI in testing for at least 6 months

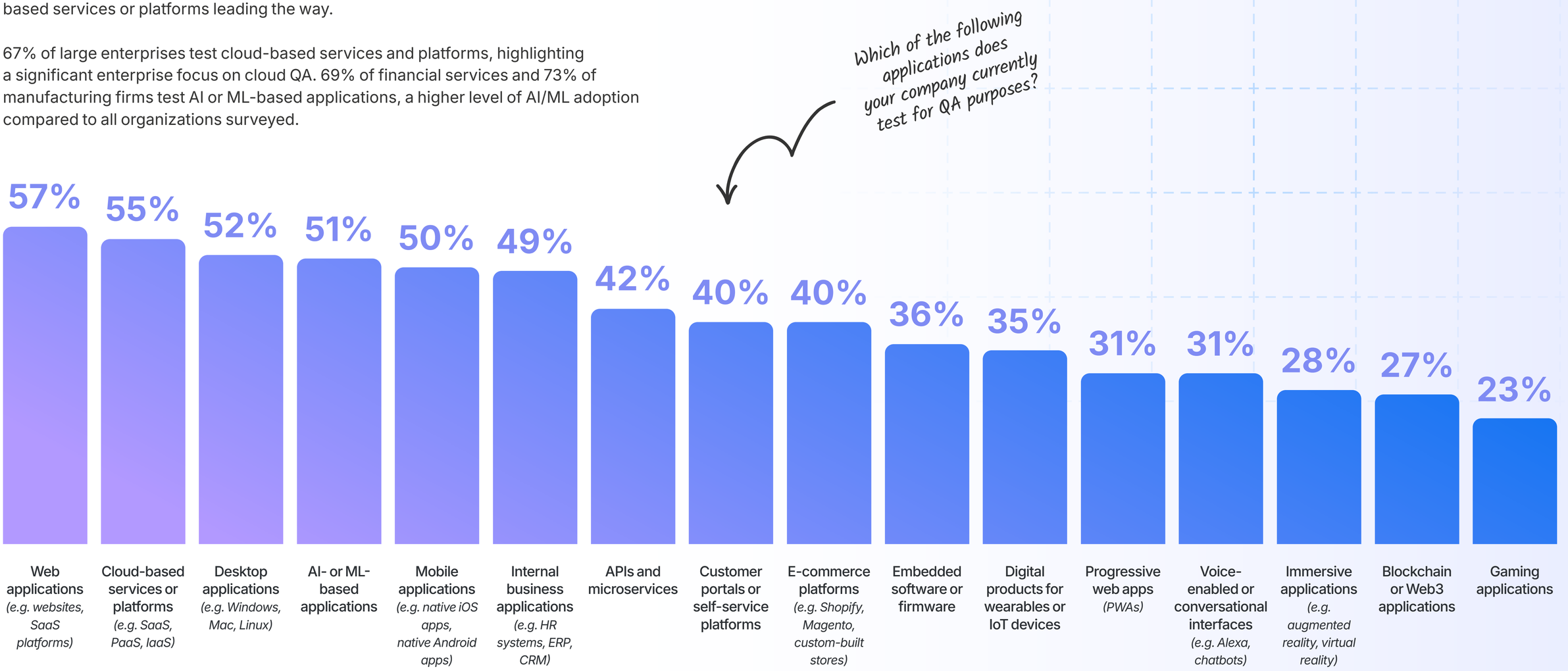


LANDSCAPE

Where AI is making an impact

Companies test a wide variety of application types, with web applications and cloud-based services or platforms leading the way.

67% of large enterprises test cloud-based services and platforms, highlighting a significant enterprise focus on cloud QA. 69% of financial services and 73% of manufacturing firms test AI or ML-based applications, a higher level of AI/ML adoption compared to all organizations surveyed.



LANDSCAPE

AI is used in all parts of the test cycle

Today, AI is mostly used to drive efficiencies. Test case and test data generation make it faster to stand up tests. Companies also use AI to optimize and maintain tests through code-level changes in a software application such as a new feature or updates to existing functionality.

Compared to all companies surveyed, large enterprises are 40% more likely than all companies surveyed to use AI for test data generation or synthesis , and 60% more likely to use it for predictive analytics.

In which areas of software testing has your company implemented AI?

LANDSCAPE

AI addresses a wide variety of use cases

Manually generating test use cases, conducting accessibility testing, and analyzing test coverage to find gaps can take days or weeks, and teams of several QAs and Developers, depending on the feature complexity, requirements, and scope. But AI is speeding up these processes significantly for testing teams.

Large enterprises use AI to prioritize test cases based on risk or recent code changes, detect defects earlier in the development cycle, and generate test cases—50% of large enterprises said they used AI for each of these use cases, which is higher than all companies surveyed.

By region, 42% of American companies, 44% of UK companies, and 28% of companies in mainland Europe have implemented AI for accessibility tests.

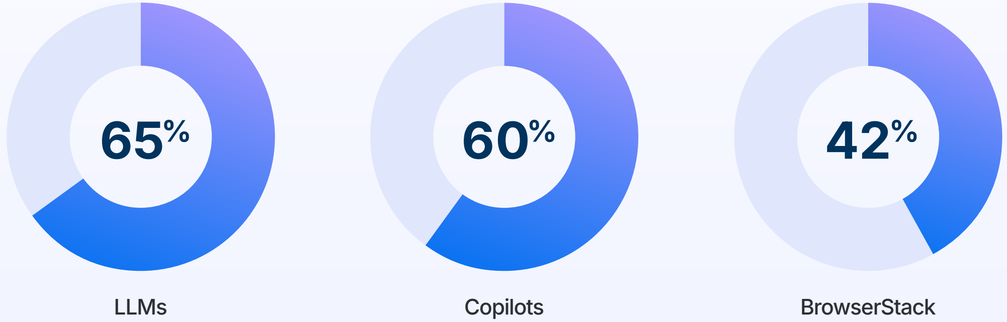
Which of the following use cases is your company addressing, or looking to address, by integrating AI into software testing?

LANDSCAPE

Tools and technologies in AI software testing

While LLMs are the most common AI tool used in testing, companies that have been using AI the longest (4+ years) are less likely to rely on them, suggesting that teams shift to more advanced or proprietary tools as their AI usage matures.

Top 3 AI software testing tools used by companies



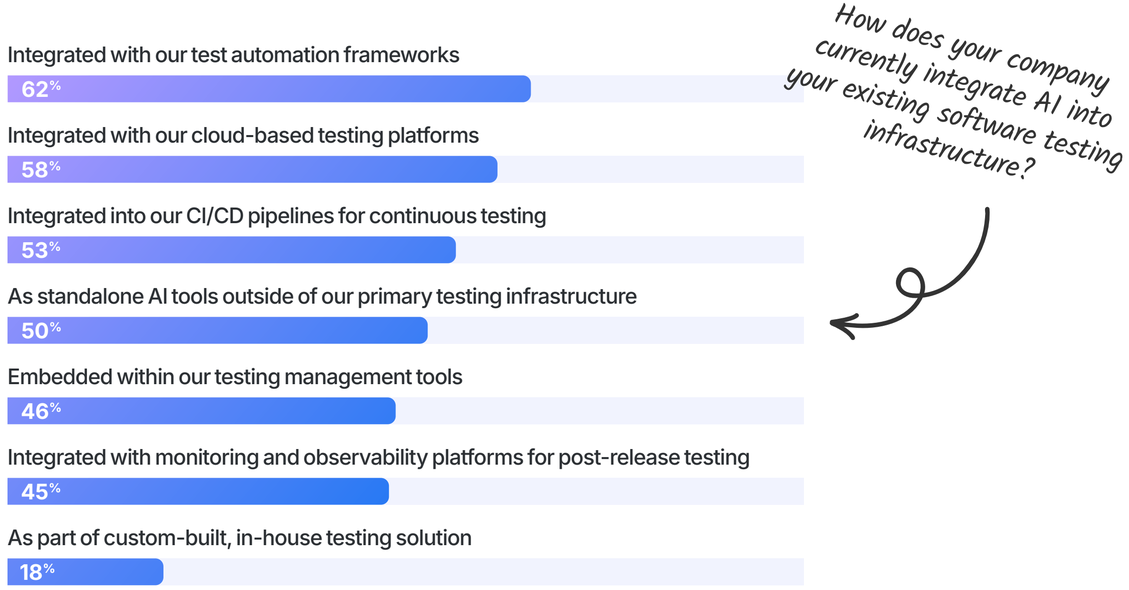
AI is most commonly used for foundational components of the test cycle.

The top three use cases for AI in software testing are:

1. **Testing automation frameworks**
   AI can generate and update software tests, creating new tests based on natural language, or analyzing user behavior to design new test cases and decrease manual efforts.

2. **Integrating with cloud-based testing platforms**
   AI can analyze code changes, distribute tests across cloud resources, and prioritize tests by device or browser based on usage patterns to reduce time and costs.

3. **Accelerating CI/CD pipelines**
   AI can predict failures, identify root causes, and figure out which tests need to run based on code changes, speeding up the software testing lifecycle.

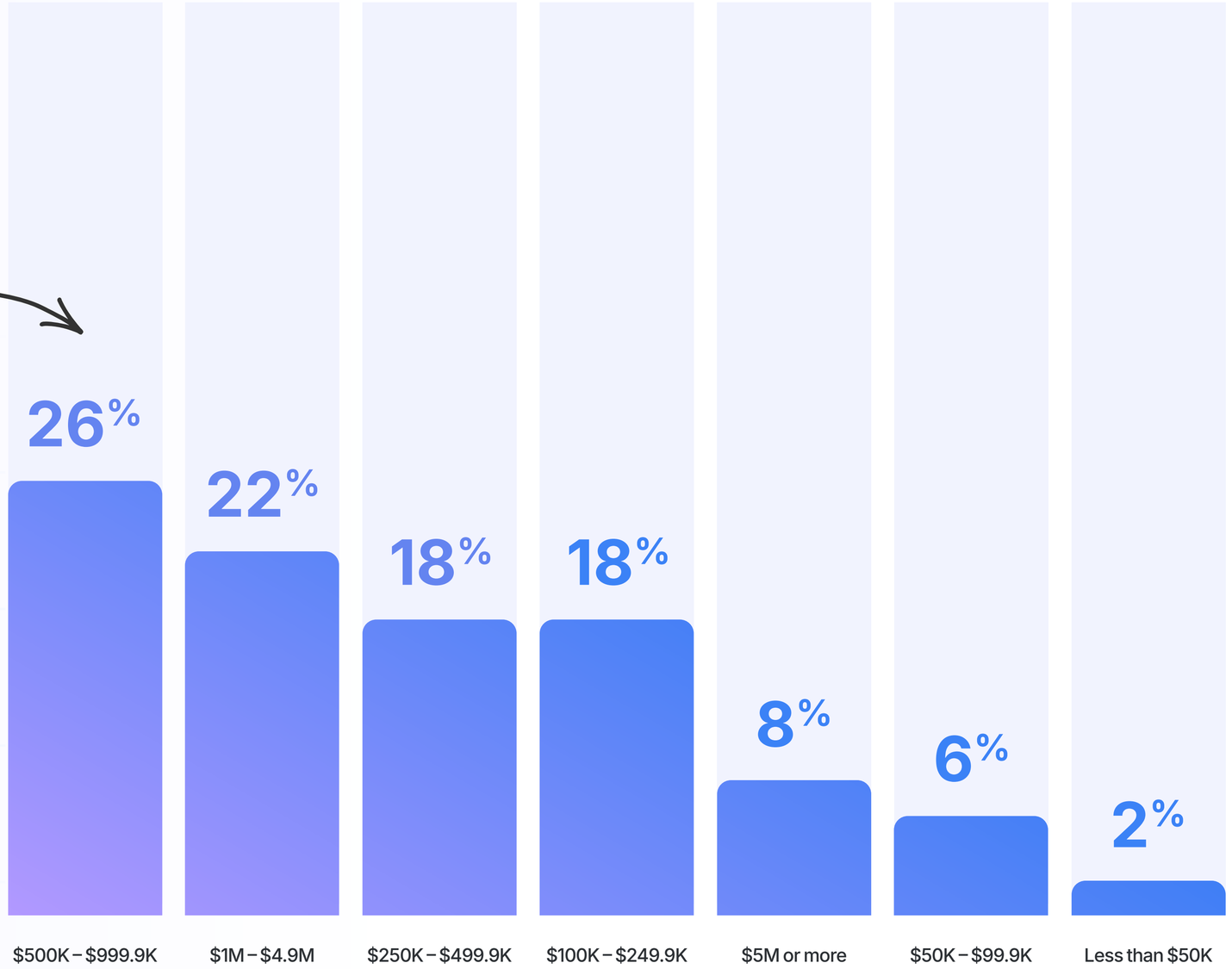


LANDSCAPE

AI testing budgets

On average, companies spend over one-third of their development budget on testing, and have 1-3 QA engineers for every 10 developers, which can add up quickly. Organizations with 5,000 to 9,999 employees are most likely to budget between $1M and $4.9M for AI in software testing (38%), while large enterprises are most likely to allocate over $5M annually (39%).

What is your company's current annual budget for exploration and/or adoption of AI in software testing?



LANDSCAPE

Roles involved in exploring and adopting AI use in software testing

While C-Suite employees like CTOs or CIOs are most likely on average to be tasked with driving AI adoption, certain company profiles have different team members responsible for leading the charge.

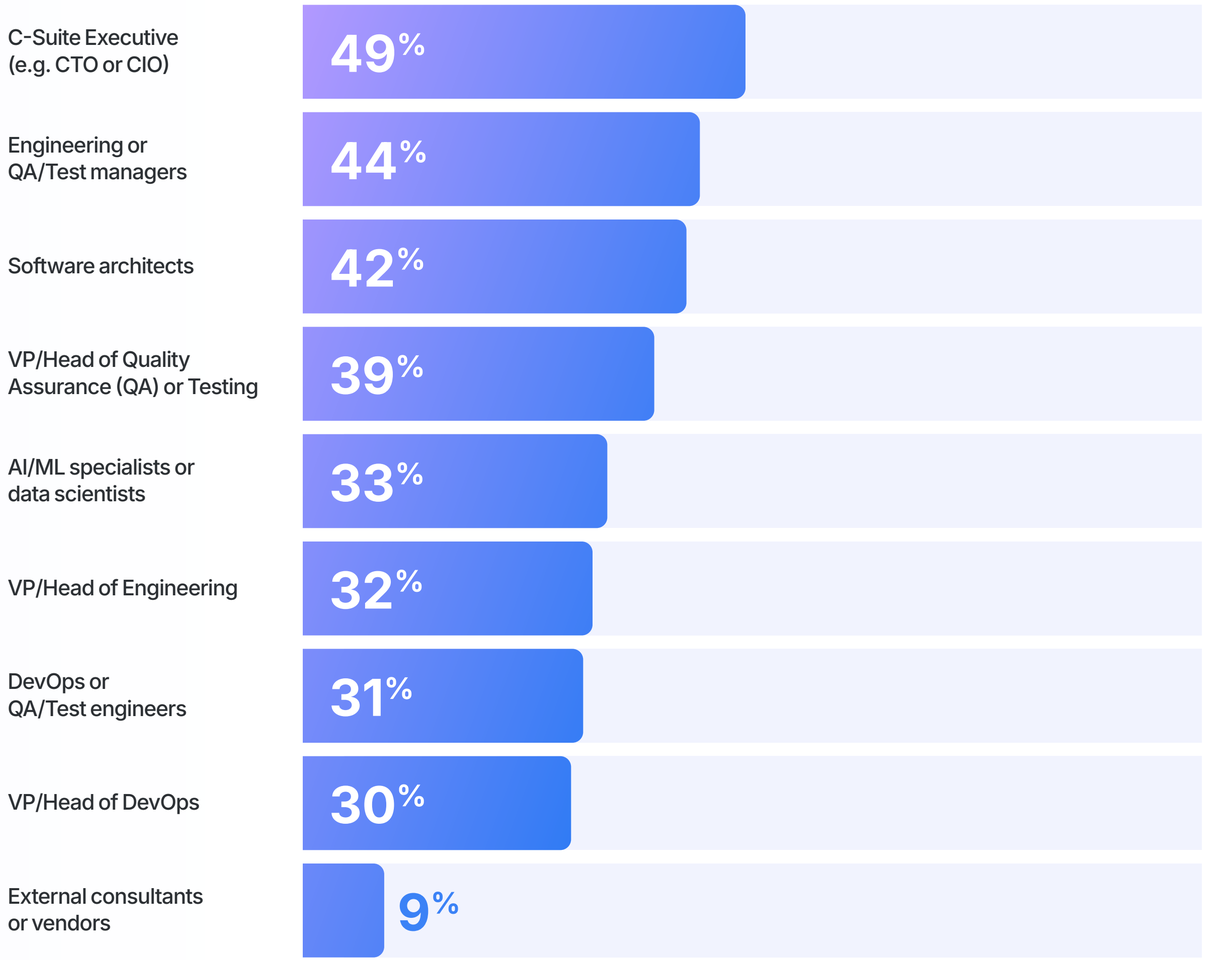
Large enterprises
AI/ML specialists or data scientists (61%)

High-budget organizations ($5M+ annually)
Engineering or QA/test managers (67%)

Organizations where testing is 81-100% automated
Heads of quality assurance or testing (61%)

Companies that are earlier in their overall growth trajectory or automation journeys often assign a senior leader who can drive change across the company, while those with more established processes have specialized functions to handle this work.

Which of the following role(s) in your company are responsible for the exploration and/or adoption of AI use in software testing?



LANDSCAPE

Key takeaways for software testing teams

1

AI adoption has reached mainstream implementation

Assess your own organization's maturity against the 44% of companies that have been using AI in software testing for 1-2 years and the 28% that adopted AI for software testing within the last year. AI adoption is rapidly accelerating, and as more and more companies follow suit, the gap between organizations that use AI and those that don't will grow ever wider.

2

Start with test generation, then expand systematically

Start with focused use cases like test data or test case generation, the most popular AI implementation areas. These early wins build momentum, as you'll learn how to best integrate AI into your existing technology stack and prove ROI from these cases.

3

Prioritize integration over standalone AI tools

When adopting AI, prioritize tools that integrate with your existing automation frameworks, your central data store, and ever-changing code base. The time you'll spend to get set up on general LLMs is much better spent on integrating tools that will not only offer more value and return on investment, but can also become a long-term part of your tech stack. Look for flexible and integrated platforms like BrowserStack's test platform, powered by purpose-built AI testing agents.

PERFORMANCE

Measuring the ROI, benefits, and business impact of AI

The business case for AI testing is no longer theoretical.

64%

of companies

achieve over 51% ROI from AI in testing

18%

of companies

achieve over 100% ROI from AI in testing

ROI improves with AI maturity. Organizations that have used AI in testing for more than 4 years are 83% more likely to report over 100% ROI than all companies surveyed. While it takes time for gains to be fully realized, this indicates that AI is a long-term value generator for companies willing to invest in it.

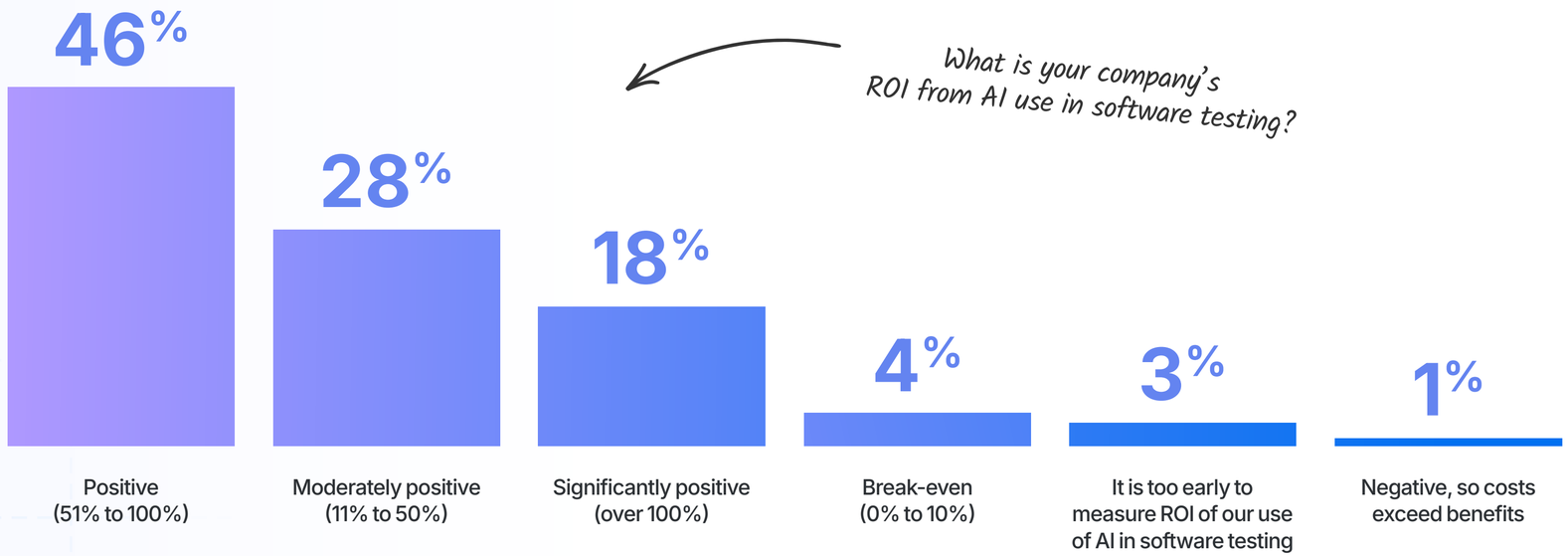
How ROI is measured varies by organizational maturity as well. Early adopters focus on speed and cost reduction, while experienced teams measure productivity gains, work quality improvements, and strategic capabilities.

PERFORMANCE

The ROI of AI in testing

AI is already showing highly positive results for software teams. QA teams spend a good amount of time managing testing, from developing new tests, to sourcing test data, to cataloging results.

"QA teams usually spend between 10-20% of their time developing software on test management and maintenance, which takes away from product development," says Ajesh Viswambharan, Director of Quality Assurance at BrowserStack. But with AI, they're seeing strong returns on investment, from time savings, to cost savings, to better products, and AI tools are paying for themselves.



92%

of organizations

see positive ROI from AI use in software testing.

Who's most likely to see ROI over 100%?

Companies using AI for test suite optimization
139% more likely (43% vs. 18%)

Companies that plan to significantly increase their AI budgets
122% more likely (40% vs. 18%)

Companies using AI for accessibility testing and predictive analytics
83% more likely (33% vs. 18%)

Companies using AI in testing for more than 4 years
83% more likely (33% vs. 18%)

Technology sector
28% more likely (23% vs. 18%)

PERFORMANCE

Measuring the success of AI-powered testing

While improved defect detection rates and reduced escaped bugs is the top way companies measure ROI from AI in testing, priorities vary across organization types.

Those with fully autonomous or AI-driven testing strategies are more likely to measure ROI by increased developer and QA team productivity. Nearly 80% of those investing more than $5M in annual AI testing prioritize enhanced test coverage across platforms, devices and browsers, 60% higher than all teams surveyed.

For organizations newer to AI in testing, the highest priority is faster release cycles and increased deployment frequency, 23% higher than the average, suggesting that these efficiency gains are a primary reason companies adopt AI.

How companies measure ROI by company size

500-999 employees

50%

Time savings from reduced manual testing efforts

1,000-4,999 employees

57%

Faster release cycles and increased deployment frequency

5,000-9,999 employees

65%

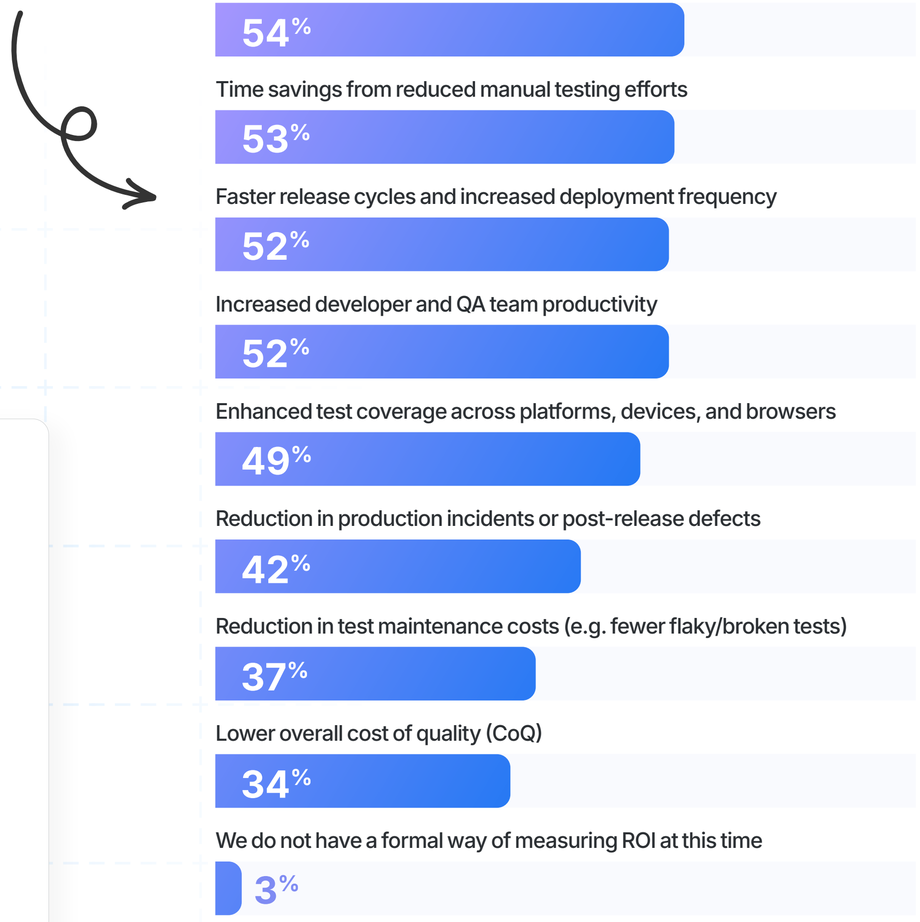
Improved defect detection rates and reduced escaped bugs

10,000+ employees

63%

Enhanced test coverage across platforms, devices, and browsers and improved defect detection rates and reduced escaped bugs

How does your company currently measure the return on investment (ROI) of AI use in software testing?



PERFORMANCE

Top benefits of AI for testing teams

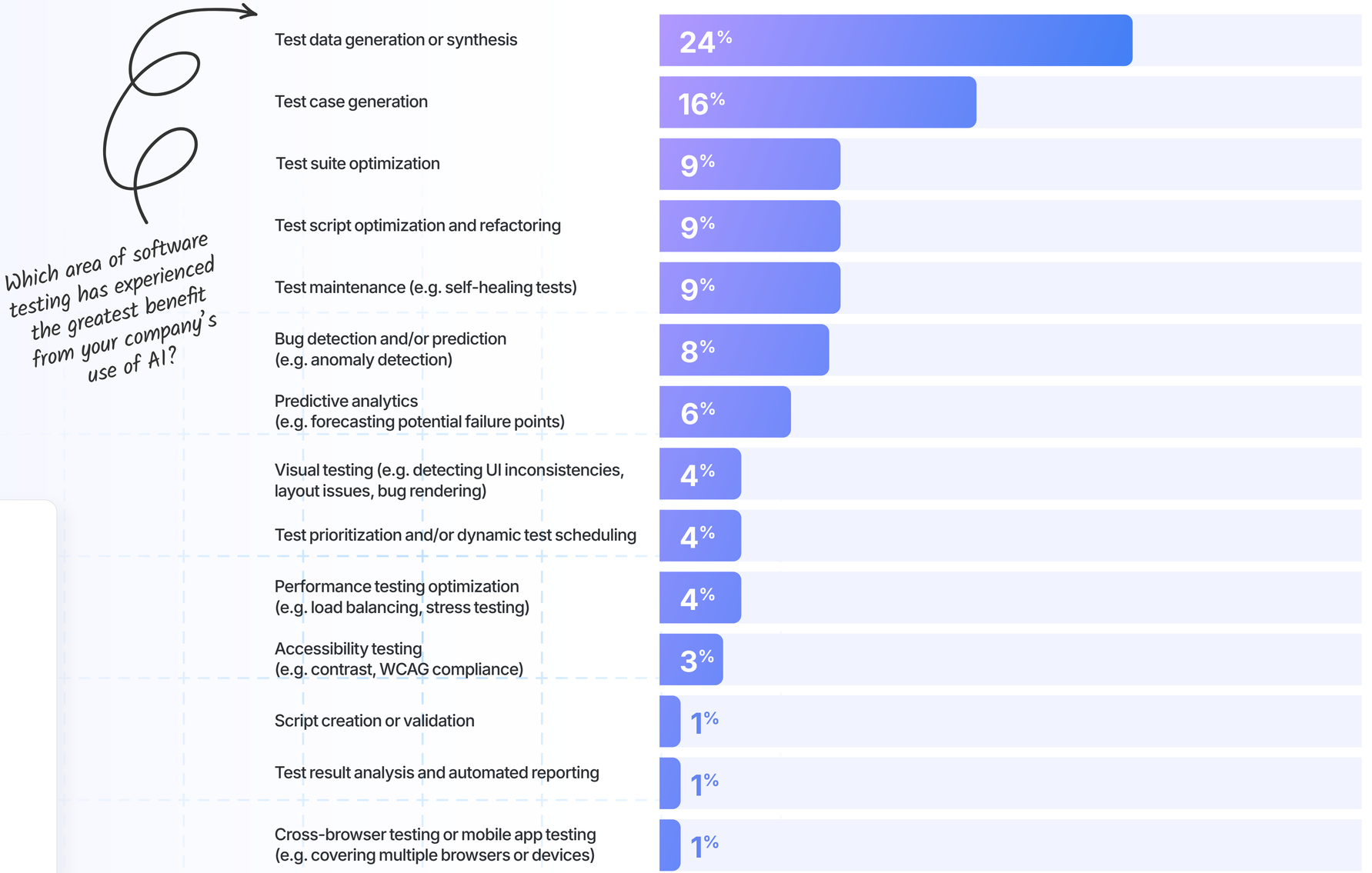
Test data and test case generation are cited as top benefits by 31% of recent AI adopters, suggesting that these are the fastest areas to realize AI benefits. More than 1 in 4 companies that plan to increase their AI budgets by 25% or more next year say test case generation is their greatest benefit since implementing AI, 69% higher than the average—further evidence that AI-driven automation drives results, and therefore reinvestment.

39%

of respondents

with 100%+ ROI that say test case generation is the greatest benefit of AI.

Which area of software testing has experienced the greatest benefit from your company's use of AI?



PERFORMANCE

Key takeaways for software testing teams

1

Positive ROI is the norm, with returns accelerating over time

To set your teams up for success in the long term, build a multi-year investment case that projects major ROI acceleration in years 3-4, rather than aiming for immediate transformation. To drive efficiency, speed delivery and save money, calculate and track test automation ROI.

2

Match metrics to your adoption stage

Start off by measuring time savings in release cycles and increased deployment frequency. As your AI implementation becomes more sophisticated and integrated, expand to measuring team productivity and test coverage.

Currys, a leading omnichannel UK retailer, adopted BrowserStack to unify a fragmented testing process. The team went from deploying once every two-week sprint to as much as four times per sprint, with some teams releasing updates as frequently as every few days.

3

Test data generation delivers fastest wins

AI can synthesize data that mimics real-world scenarios, edge cases, and testing conditions while maintaining privacy and security through data masking and anonymization and keeping organizations compliant. Once you understand how to best integrate AI into your tech stack and workflows, expand to test case generation, then test suite and test script optimizations within 18 to 24 months using low code automation testing guide.

4

Measure holistically beyond cost savings

Balance quality, speed, efficiency, and strategic capability metrics to capture full ROI and sustain executive support.

Wag!, an American pet care company, has reduced the average test time from an hour to less than 3 minutes thanks to AI. Wag! now runs full regression tests daily and can deploy new tests with the push of a button, enabling high release velocity and removing friction from the test process.

STRATEGY

Navigating the challenges of implementing and scaling AI

While AI testing adoption is widespread, teams still face implementation challenges. Integration complexity is the most-cited barrier, outpacing both budget constraints or lack of tools. The desire to use AI is there—but realizing its full value takes some elbow grease.

Challenges vary substantially by company size, industry, and AI maturity. Here are just some of the differences:

Companies with 5K-10K employees

39%

higher than average concerns about lack of skilled talent

Large enterprises (10K+)

26%

higher IP protection concerns

Financial services companies

65%

higher accuracy and reliability concerns

Companies just exploring AI

43%

higher challenges with limited understanding of the technology

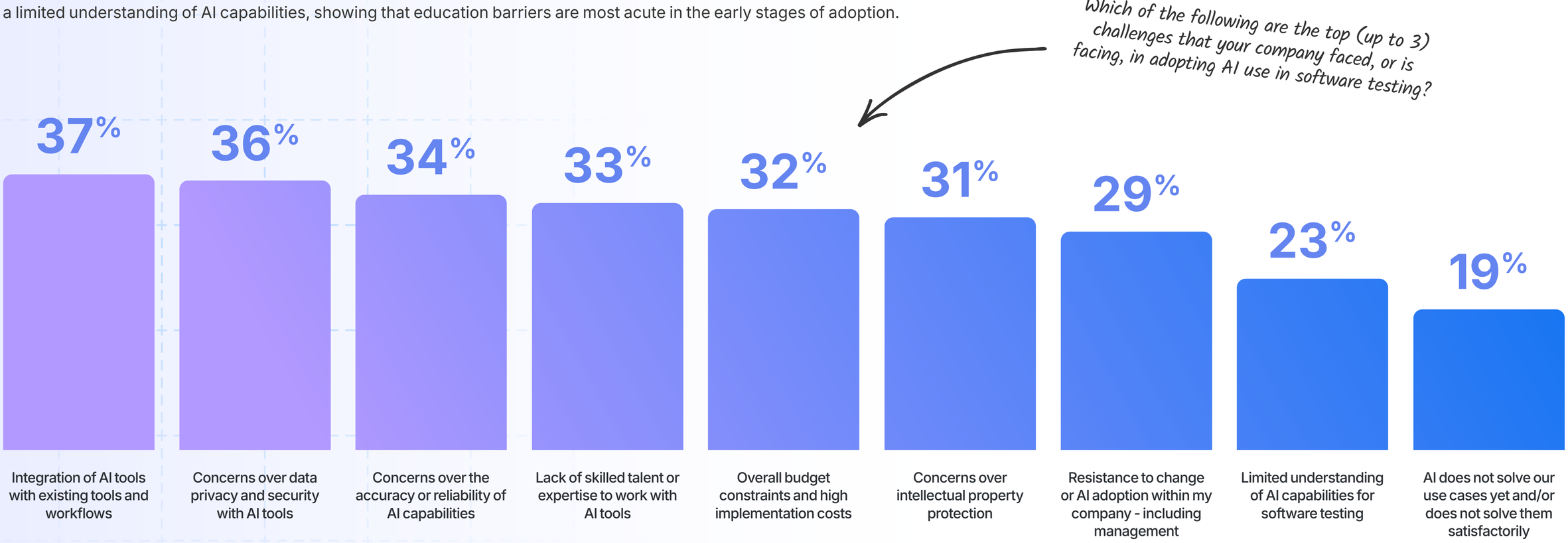
Regardless of these profile- and sector-specific differences, successful teams have one thing in common: They address challenges proactively, not reactively. Assess your organization's readiness to adopt a new technology to anticipate your biggest challenges, and make a plan to address them.

STRATEGY

AI implementation challenges

Overall, the top challenges in adopting AI in software testing are integrating with current workflows, data privacy concerns, and reliability concerns. After all, the role of testing is to ensure accuracy, and AI tools are known for hallucinating or generating incorrect information. One third of organizations also struggle with a lack of skilled talent to work with AI tools, which is top of mind for engineering leaders going into 2026.

In retail/e-commerce, where personalization at massive scale is essential, concerns about AI's accuracy are 47% higher than all companies surveyed. Companies that are just exploring AI or have budgets lower than $50,000 are challenged by a limited understanding of AI capabilities, showing that education barriers are most acute in the early stages of adoption.



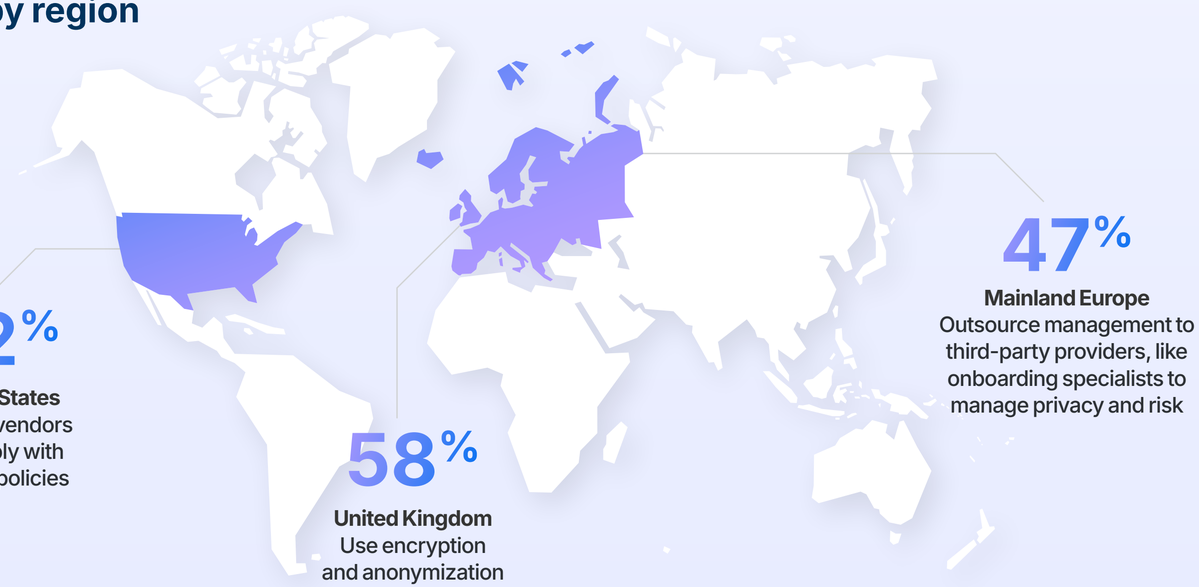
STRATEGY

Security and privacy approaches

100% of companies have processes in place for AI data privacy and security, the second most common implementation concern. Companies employ a mix of internal policies, data hygiene best practices, and adherence to external industry standards to protect their customers.

Companies with the smallest budgets (less than $50K annually) are 43% more likely than all companies surveyed to conduct regular assessments, and 76% more likely to restrict AI usage to non-production environments, suggesting companies early in their implementations take a more conservative approach to deployment.

How companies protect data by region

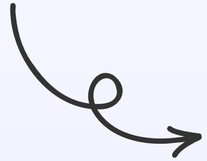


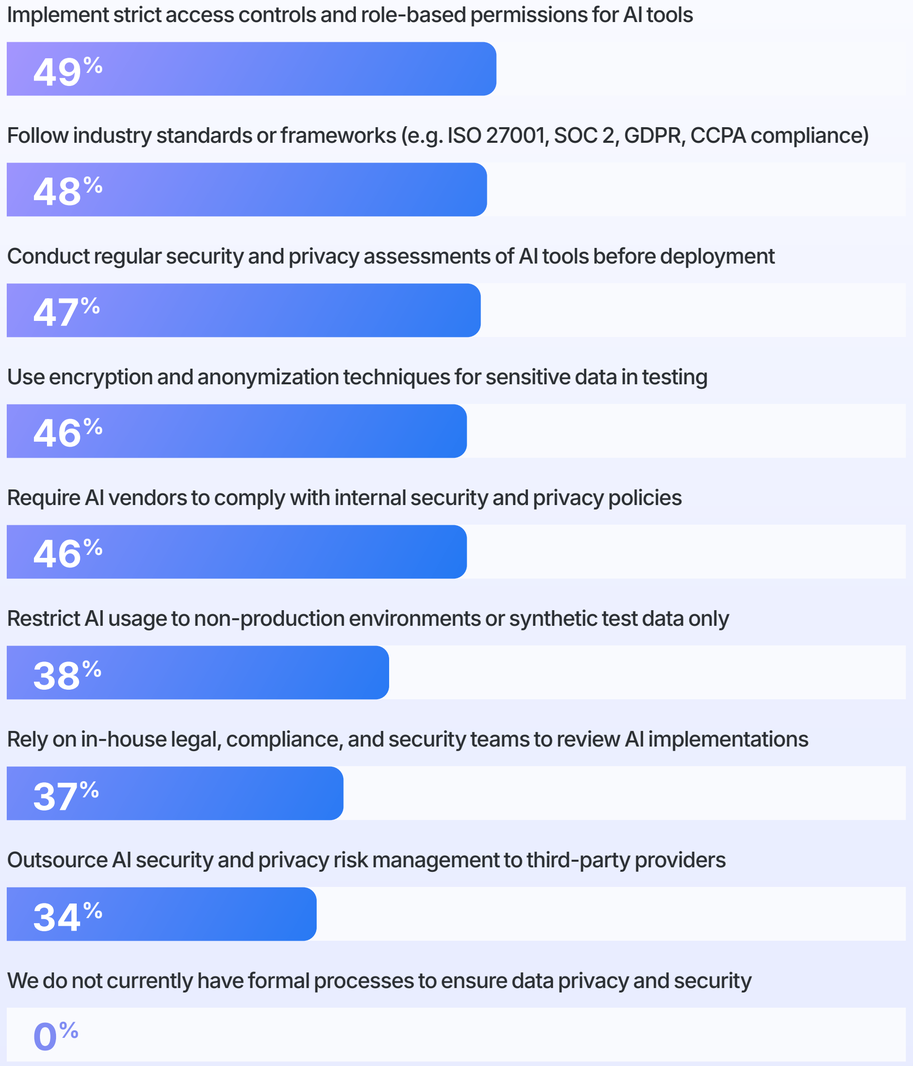
52%
United States
Require vendors to comply with internal policies

58%
United Kingdom
Use encryption and anonymization techniques

47%
Mainland Europe
Outsource management to third-party providers, like onboarding specialists to manage privacy and risk

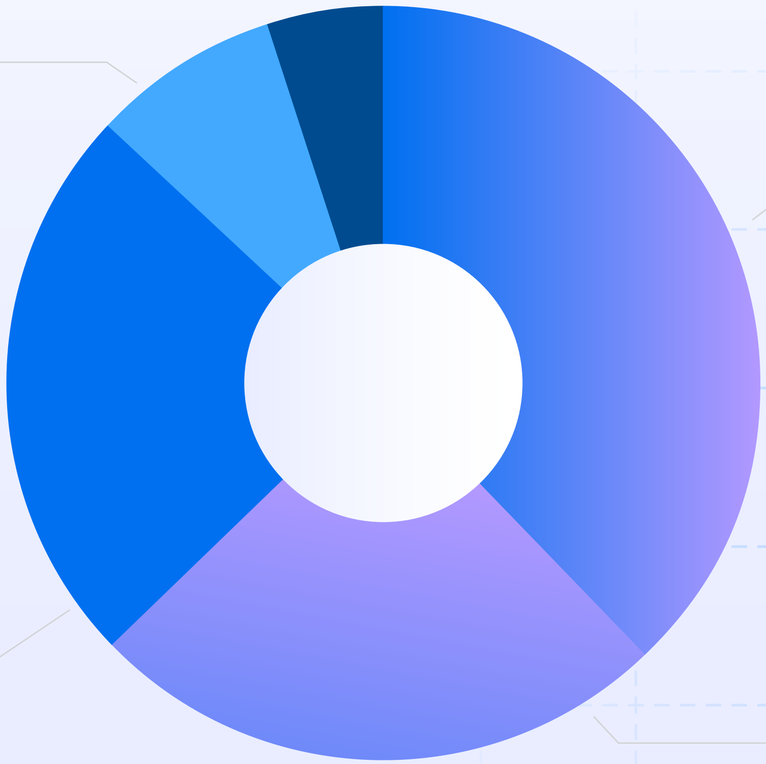
How does your company currently ensure data privacy and security with the use of AI in software testing?





STRATEGY

The automation maturity scale



54%

of companies

have a hybrid (manual and automated) approach to testing

12%

of companies

use fully autonomous/ AI-driven testing

While hybrid testing is the most common approach across regions, industries, and company sizes, necessity may be the mother of automation. Organizations with AI budgets under $50K annually are 48% more likely than all companies surveyed to take a hybrid approach to testing and 140% more likely to automate between 61-80% of testing.

STRATEGY

AI skills and capabilities on testing teams

Companies that report ROI over 100% from AI in testing are 12% more likely than all companies surveyed to offer company-sponsored training on AI in testing , showing that a customized, top-down approach to adoption may drive greater success than ad-hoc education methods. Meanwhile, the largest enterprises (10,000+ employees) are 36% more likely to rely on internal knowledge sharing.

"Helping teams adopt AI in testing means meeting them where they are. That's why we've built learning paths that range from Test University courses and detailed guides to community forums and in-person meet-ups. It's not just about the 'how', it's helping teams figure out the 'when' and 'why' too. And honestly, we learn as much from our customers as they do from us. Our own teams use these tools every day, so we're constantly refining what works and what doesn't."

Ganeshram Mahalingam
Senior Director - Marketing, BrowserStack

Top 5 sources professionals use to stay informed on AI developments in testing

Technology news websites and publications *(e.g. TechCrunch, VentureBeat, InfoQ): 58%*

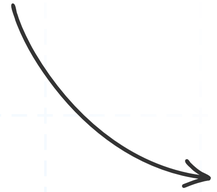
Developer forums and communities *(e.g. GitHub, Stack Overflow): 49%*

Online training platforms and certifications *(e.g. Coursera, Udemy, Pluralsight): 49%*

Professional associations *(e.g. IEEE, ISTQB, AI/ML user groups): 47%*

Industry conferences and events: *47%*

Which of the following best describes your company's current, or planned, approach to training or upskilling employees on the use of AI in software testing?



STRATEGY

Key takeaways for testing teams

1

Integration capability should drive tool selection

Given that integration with existing systems is named as companies' biggest AI challenge, look for native connections to your current tech stack when evaluating vendors. Prioritizing integrations will ease your initial implementation, speeding up time to value and setting your team up for long-term success. Check whether BrowserStack integrates with your test infrastructure.

2

Implement layered security from day one

Deploy access controls, pre-deployment assessments, and data encryption to keep your company and customer data safe. Review our guide to the Model Context Protocol and AI security to get started with security best practices.

3

Set realistic automation targets by maturity level

Converting an all-manual testing process to a hybrid or mostly-automated approach takes time. Start small with a focused set of use cases, then use learnings from success and failure to iterate and optimize as you automate more of your software development lifecycle. Review the test types that should be automated, the process of automating tests, and frameworks to build test cases.

4

Build multi-modal training programs immediately

Take a page out of high-ROI companies' books by investing in formal training tailored to your company's needs, supplemented with external resources, internal knowledge sharing, and vendor-specific courses like BrowserStack Test University.

PREDICTIONS

The future of AI-powered testing

Investment in AI testing is accelerating, but teams need to allocate that budget strategically—toward deeper integrations, greater autonomy, and expanded human-AI collaboration.

As AI evolves, QA roles will too. 50% of software professionals anticipate increased AI upskilling needs. Another 46% expect greater emphasis on test strategy planning and oversight. And employees at organizations with mostly manual testing are 44% more likely to expect a reduction in overall QA roles, given that these teams have the most manual work to automate.

"The next phase of AI in testing isn't about adding more tools, it's about eliminating the seams between them. Teams today bounce between multiple tools to understand test health, debug failures, and prioritize what to fix. Within two years, that fragmentation disappears - AI will connect what's breaking, why it matters, and how to fix it, all in the context of your actual delivery goals. The teams that win will be those who stop asking 'what can AI do?' and start asking 'what should humans stop doing?'"

Dhimil Gosalia
VP of Product, BrowserStack

"Stop asking 'what can AI do?' and start asking 'what should humans stop doing?'"

Dhimil Gosalia, *VP of Product, BrowserStack*

PREDICTIONS

Investments and budget expectations

Unsurprisingly, companies with the highest AI budgets are 79% more likely than all companies surveyed to expect a significant (25%+) increase in AI budget for the next year, suggesting that top AI spenders are seeing enough value to justify large-scale reinvestment. Those with 81-100% of their test cycles automated are 158% more likely to expect the same increase, indicating a strong correlation between automation maturity and reinvestment in AI.

Companies earlier in their AI journeys are reinvesting too, albeit at slightly lower levels. Those who adopted AI in software testing in the last 6 months are 34% more likely to expect an 11-25% budget increase, while those that have automated 21-40% of their test cycle are 20% more likely than all companies surveyed to expect the same increase.

88%

of teams

expect to increase their AI budgets by more than 10% next year

24%

of teams

expect to increase their AI budgets by more than 25% next year

PREDICTIONS

Upcoming tech changes

Greater integration into test workflows is the top anticipated change in how companies will use AI in software testing, consistent with our finding that most companies adopted AI in the last two years and are now ready to incorporate AI in a more meaningful way.

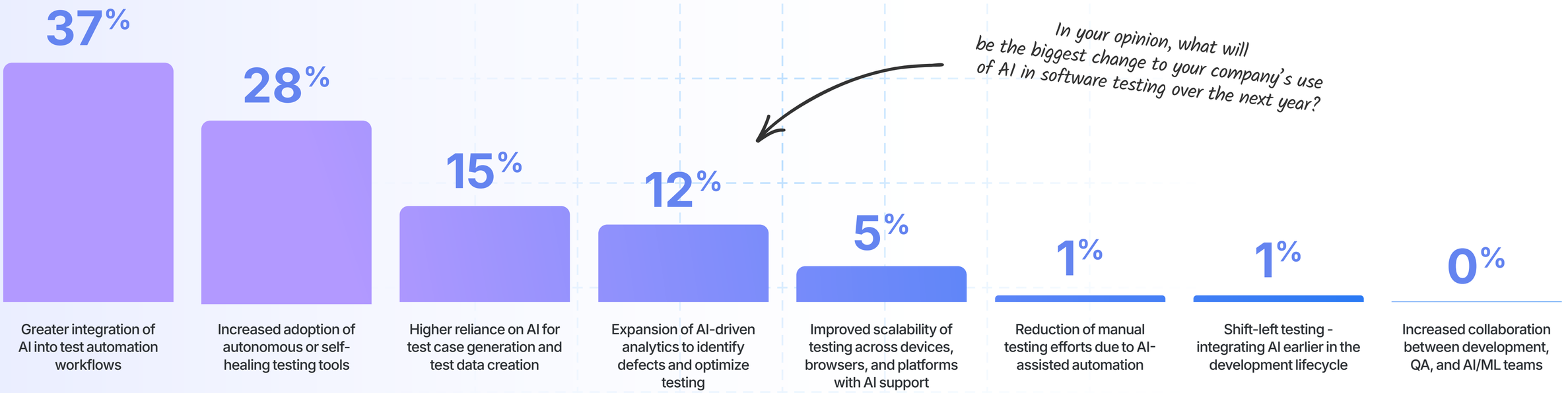
This expectation is most pronounced at organizations with the largest AI budgets (25% more likely than the average) and teams with 81-100% automated testing.

How anticipated changes differ by industry

Technology
16%+ Greater integration of AI into test automation workflows (43% vs. 37%)

Financial services
43%+ Expansion of AI-driven analytics to identify defects and optimize testing (20% vs. 12%)

Manufacturing
29%+ Increased adoption of autonomous or self-healing tools (36% vs. 28%)



PREDICTIONS

How testing roles are evolving

While upskilling in AI technologies and tools is the top anticipated change to QA roles, the majority of respondents predict substantive evolutions in QA's role within their broader organization. Software professionals not only believe that QA roles will emphasize more strategic analysis and oversight of testing processes, they also predict that QA teams will play an elevated role in the software development lifecycle.

In your opinion, how will the role of QA professionals evolve with the expanded use of AI in software testing?

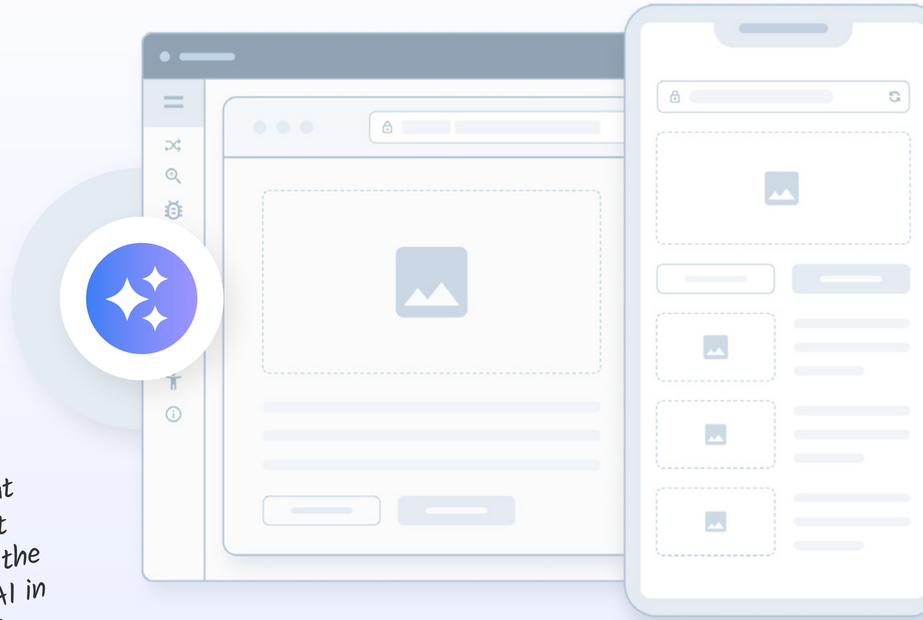
PREDICTIONS

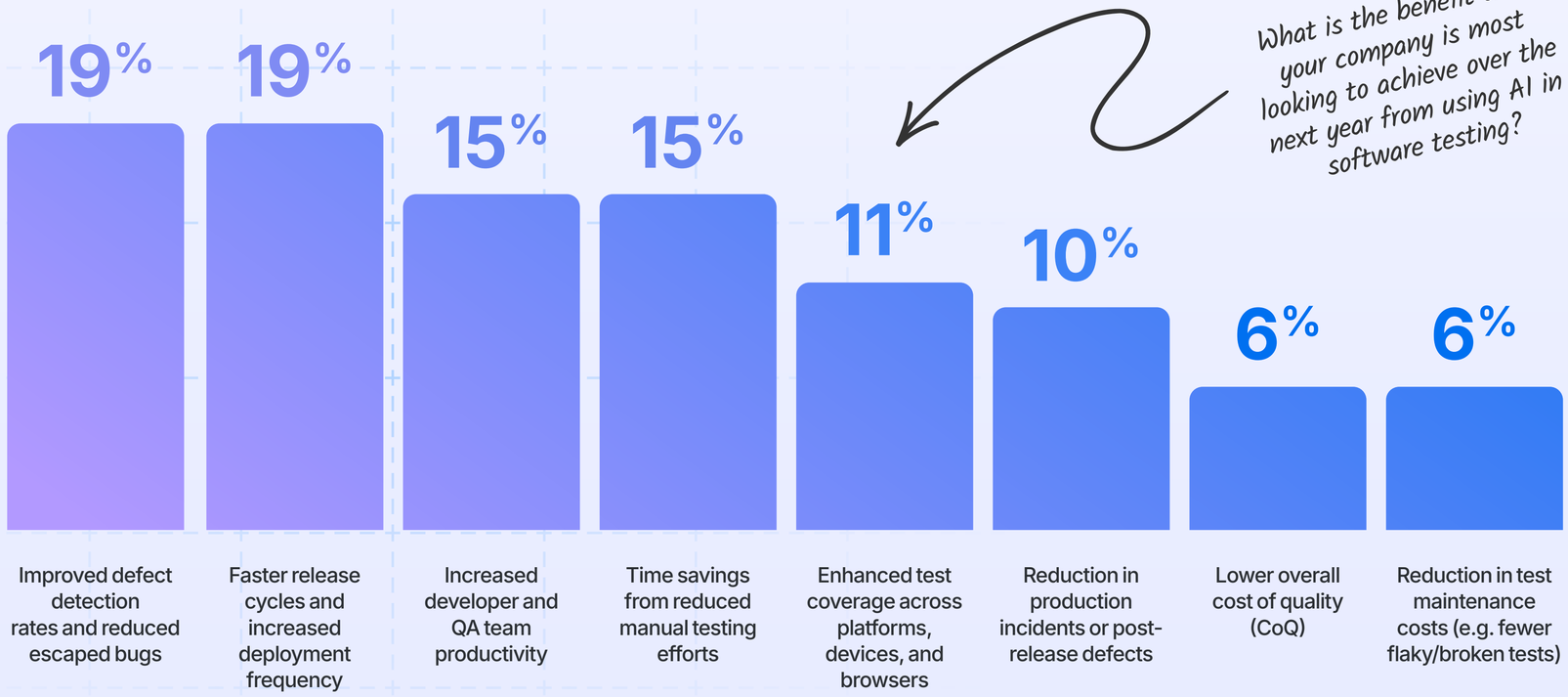
Goals for the year ahead

While improved defect detection rates and faster release cycles are the most desired benefits from using AI in software testing, companies' AI goals are fairly evenly distributed.

Midsize enterprises are 105% more likely than all companies surveyed to want faster releases. Large enterprises are 183% more likely to want reduced test maintenance costs and 70% more likely to want reduced production incidents or post-release defects , suggesting that stability in releases is particularly important to this segment.

Meanwhile, organizations with the lowest AI budgets are 167% more likely to aim for increased team productivity.





Methodology

A 30-question survey was administered to 1000 software professionals around the globe. Respondents included a sample of leaders and decision-makers who are responsible for software testing and/or management, at companies with 500+ employees.

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