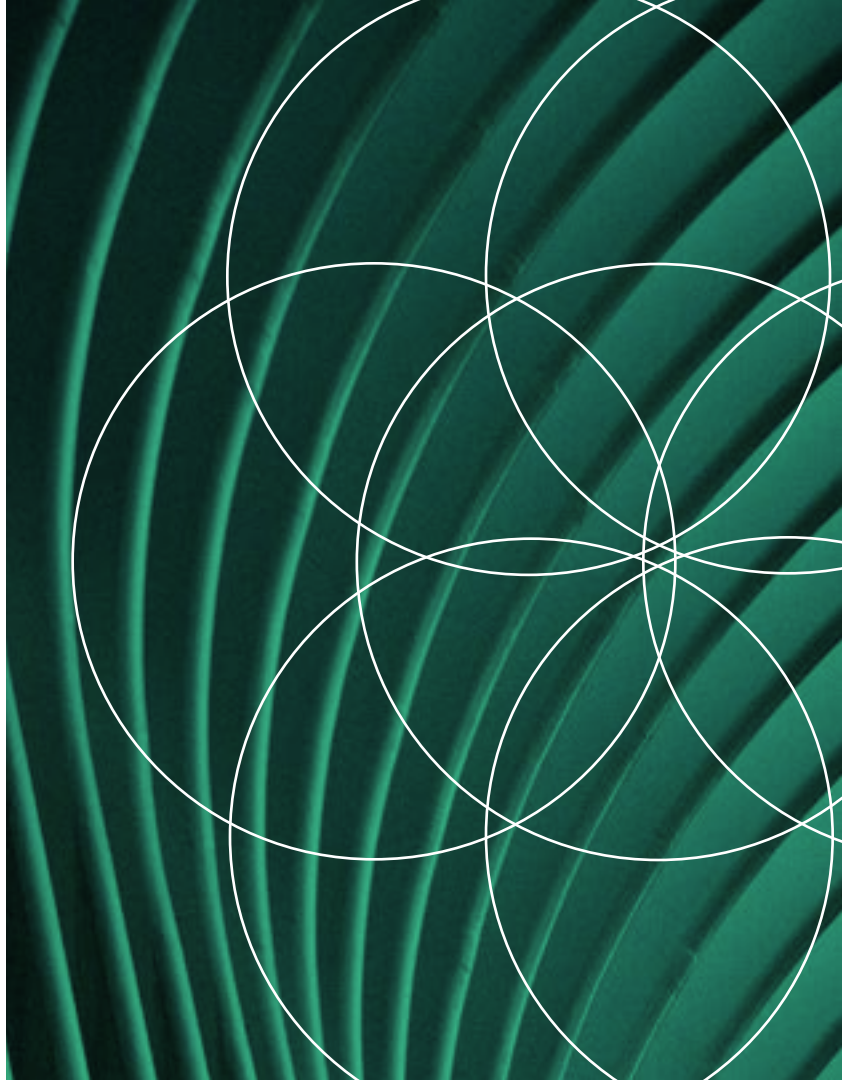


# AI And The Next Generation Of Software Testing

Expect Rapid Growth In AI-Driven Test Automation To Improve  
Quality And Experiences And Reduce Long-Term Costs

Get started →



## Testing Reinvented: Harness AI And GenAI To Do More And Do Better With Less

TuringBots (AI and generative AI [genAI] for software development) speed up and improve the software development lifecycle (SDLC). Short term, TuringBots will assist all development roles. Midterm, TuringBots will become better peers to humans and more accurate. Long term, they will become more autonomous with additional reasoning capabilities and some human supervision, but productivity will reach unimaginable heights.<sup>1</sup>

In August 2024, UiPath commissioned Forrester Consulting to explore the adoption of AI and genAI to automate and improve software testing. We surveyed 210 global automation and testing decision-makers and found that AI-driven test automation adoption is very high and driven by a desire to improve the quality of both products and experiences and reduce costs.

### Key Findings



Quality is the top priority as organizations seek to deliver better products and customer and employee experiences (CX/EX).



AI-powered test automation promises better products and experiences and reduced costs via accelerating the shift from manual to automated testing, improving test coverage, and enabling continuous integration and continuous delivery (CI/CD).

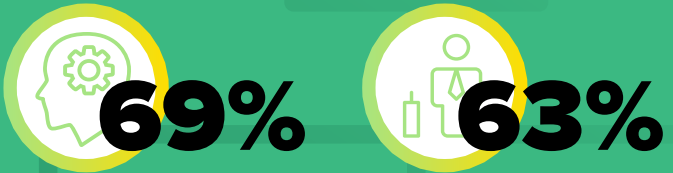


Expect rapid growth as nine in 10 respondents say their organization plans to implement AI-powered test automation. Tester TuringBots will revolutionize testing practices and eventually become agentic to deal with even more complexity.

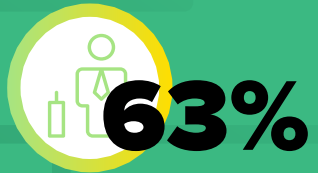
## Quality Underpins Top Organizational Goals Of Improved Innovation And Customer And Employee Experiences

Improving their ability to innovate, improving employee and customer experiences, and reducing costs are respondents' top priorities in the next 12 months, alongside maturing their organizations' use of AI technology in testing to improve the quality of their products and services. We believe investing in AI for improved quality will enable organizations to achieve their innovation and experience goals — and save costs in the long run.

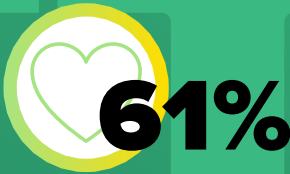
### Top Organizational Priorities



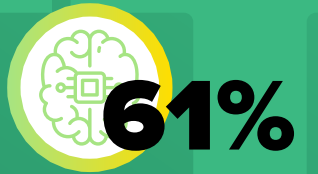
Improve our ability to innovate



Improve our employee experience



Improve our customer experience



Adopt, increase, and/or mature use of AI technology



Reduce our operating costs

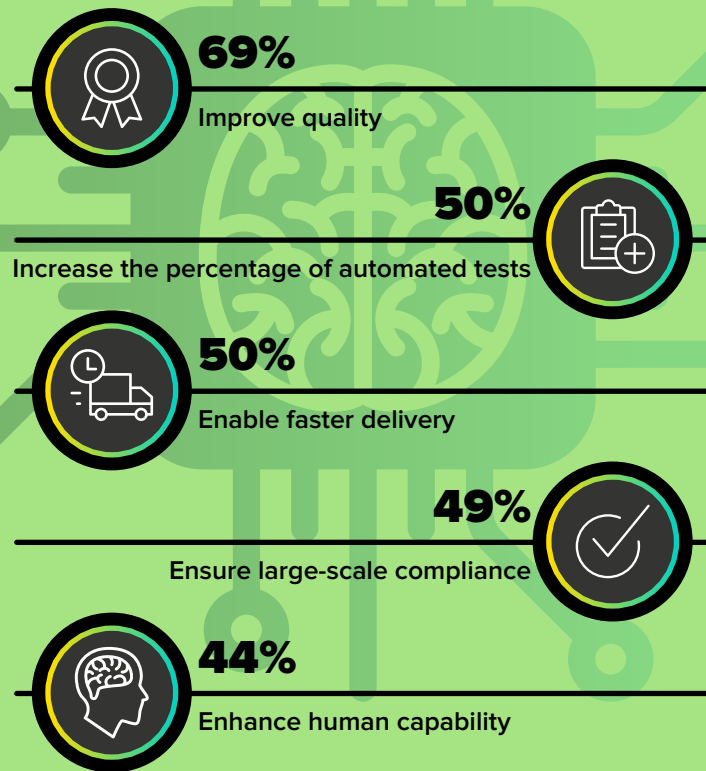


Improve the quality of our products/services

## Improving Quality Is The Top Test Automation Goal

Improving application quality is not only a top organizational priority but also the top test automation goal. To achieve this goal, respondents seek to increase the ratio of automated tests (a word of caution that while increased automation is good, rashly automating as many tasks as possible could have a negative impact on quality). They also seek to enable faster delivery of applications and features and ensure compliance as automation scales. But with genAI, they can optimize the test cases before automating, saving effort and test execution computing from unnecessary tests. Forty-four percent also say enhancing human capabilities is a top test automation goal — increased and optimized automation can mitigate human error while improving the tester experience by removing menial tasks.

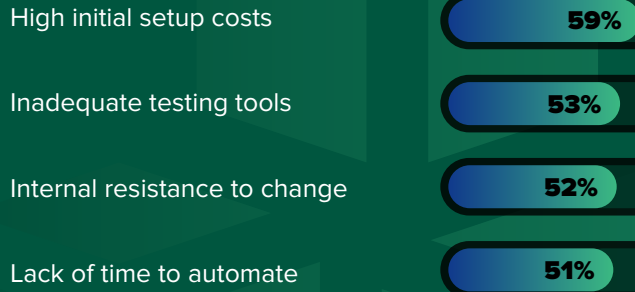
## Top Application Test Automation Goals



## Invest In AI And GenAI To Overcome Top Test Automation Challenges

While improving quality and experiences through test automation are top priorities, respondents face many hurdles to achieving their goals. Fortunately, they see AI and genAI adoption as the means to address their top challenges. For example, while 59% say high costs are a top test automation challenge, 55% expect AI-powered test automation to reduce costs in the long run. The next biggest challenge of inadequate testing tools speaks for itself — development leaders must invest in best-in-class testing tools that harness the power of AI and genAI. People-related challenges include internal resistance to change and lack of bandwidth, both of which can be solved in part through AI-powered test automation. Respondents expect AI adoption to improve the tester experience (56%), increase agility and efficiency (53%), and improve productivity (51%).

## Barriers To Achieving Test Automation Goals



## AI-Powered Test Automation Success Metrics



Base: 210 global automation and testing decision-makers in the banking/financial services, healthcare, manufacturing, and telecom industries  
 Source: A commissioned study conducted by Forrester Consulting on behalf of UIPath, August 2024

## AI Supercharges Quality, CX, And EX

Respondents expect investing in AI-driven test automation to advance their goals of improved quality and experiences. They plan to measure the success of their AI-driven test automation initiatives via improved product/service offerings, improved end-user experiences, improved tester experiences, and reduced operating costs. Specific outcomes they expect to achieve include improving test coverage (64%), accelerating the shift from manual to automated testing (60%), enabling continuous integration and delivery of new application features and updates (58%), and improving efficiencies (54%) and accuracy through identifying issues earlier in the development process (56%).

## Outcomes Expected By Improving Application Test Automation Through AI

**64%**

Improve test coverage to ensure that applications are thoroughly tested and any potential issues are identified before release

**60%**

Transition manual testers to build automated tests

**58%**

Enable CI/CD to allow us to continuously integrate and deliver new features and updates to our applications

**56%**

Identify issues earlier in the development process

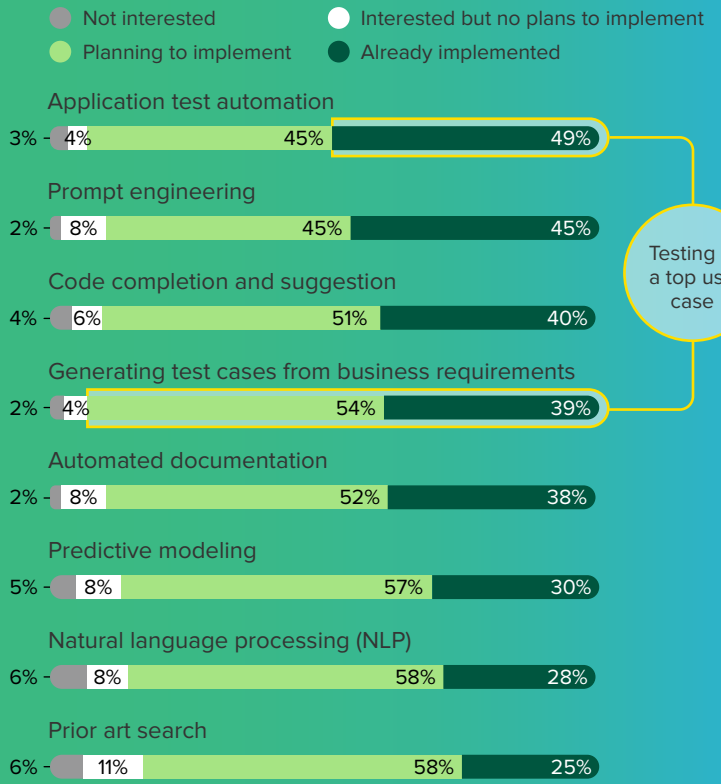
**54%**

Enhance testing efficiency to more efficiently test a larger number of scenarios and edge cases than via manual testing

## Expect Rapid Adoption Of GenAI And AI-Driven Automation In Testing

AI technologies for development have exploded, and organizations will fall behind if they don't familiarize themselves with AI tools and related benefits. Forrester expects testing will be one of the first stages of the SDLC to see significant improvement in productivity per TuringBots.<sup>2</sup> This commissioned study validates that expectation: We found testing was the top use case for AI adoption across the SDLC. Application test automation was the top capability already adopted by 49% of respondents, and using genAI to generate test cases from business requirements was the most sought-after capability — 93% of respondents say their organization has implemented it or plans to do so.

## Plans For Implementing AI Technology For Application Development



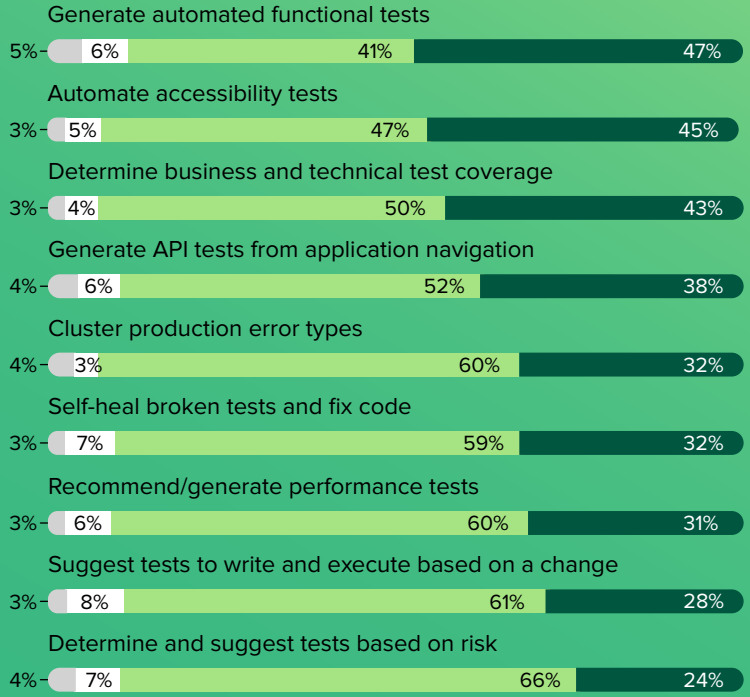
Base: 210 global automation and testing decision-makers in the banking/financial services, healthcare, manufacturing, and telecom industries  
 Note: Percentages may not total 100 due to rounding.  
 Source: A commissioned study conducted by Forrester Consulting on behalf of UiPath, August 2024

## Tester TuringBot Adoption Is High Across Use Cases

Testing TuringBots can simultaneously automate menial tasks to free up testers to focus on more interesting work and improve their decisioning or perhaps decide how to manually test some less common edge cases. We asked respondents about their organizations' plans to enable a variety of use cases via AI-powered test automation and found that across use cases, nine in 10 have plans to implement it. Among these, generating automated scripts of code for functional tests (47%), automation of accessibility tests to meet stringent regulatory compliance (45%), and the capability to determine business and technical coverage of the testing done (43%) are the top three areas where they have already implemented these practices.

## Plans For Enabling The Following Use Cases Via AI-Powered Test Automation

- Not interested
- Interested but no plans to implement
- Planning to implement
- Already implemented



Base: 210 global automation and testing decision-makers in the banking/financial services, healthcare, manufacturing, and telecom industries  
 Note: Percentages may not total 100 due to rounding.  
 Source: A commissioned study conducted by Forrester Consulting on behalf of UiPath, August 2024

## Conclusion

To keep up with the speed of development and the level of quality that software needs as the core technology of any digital business, the use of AI and genAI in testing is a must.

- **Raise your AI quotient.** To succeed with AI and generative AI, your testing workforce will need the right expertise and hard skills to identify where and when they can use Tester TuringBots, for what purpose, and what to expect from them. Make sure they are ready.
- **Assess your existing testing platform.** As genAI penetrates more in your organization's business applications, testing tools will need to evolve with genAI, too. Make sure your testing platform partner is evolving its platform quickly with Tester TuringBots.
- **Augment your testers with Tester TuringBots.** Agentic AI is the latest evolution of genAI, and vendors are rushing to include agent capabilities in their platforms. TuringBots, thanks to agentic AI, will be able to test more complex workflows, optimize testing ROI, and make your testers smarter.

## Endnotes

<sup>1</sup> Source: [The Future Of TuringBots, 2024](#), Forrester Research, Inc., July 10, 2024.

<sup>2</sup> Source: Ibid.

## Resources

### Related Forrester Research:

[The Future Of TuringBots, 2024](#), Forrester Research, Inc., July 10, 2024

[Top Recommendations For Development Leaders, 2024](#), Forrester Research, Inc., May 6, 2024

### Related Blogs/Webinars

Diego Lo Giudice, [AI And The End Of Software Development As We Know It](#), Forrester Blogs

Diego Lo Giudice, [The Future Is Now: TuringBots Will Collapse The Software Development Lifecycle Silos](#), Forrester Blogs

September 5, 2024, [The TuringBots Moment Is Here — AI In Software Dev](#), Webinar

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### Contributing Research:

Forrester's [Technology Architecture & Delivery](#) research group

## Methodology

This Opportunity Snapshot was commissioned by UiPath. To create this profile, Forrester Consulting supplemented this research with custom survey questions asked of 210 global software automation and testing leaders. The custom survey began and was completed in August 2024. The survey was conducted in a double-blind fashion. [E-61213]

### ABOUT FORRESTER CONSULTING

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## Demographics

| INDUSTRY                            |            |
|-------------------------------------|------------|
| Financial services and/or insurance | <b>25%</b> |
| Healthcare                          | <b>25%</b> |
| Manufacturing and materials         | <b>25%</b> |
| Telecommunications services         | <b>25%</b> |

| COMPANY SIZE (ANNUAL REVENUE) |            |
|-------------------------------|------------|
| >\$5B                         | <b>34%</b> |
| \$1B to \$5B                  | <b>45%</b> |
| \$500M to \$999M              | <b>21%</b> |

| REGION        |            |
|---------------|------------|
| North America | <b>50%</b> |
| Europe        | <b>25%</b> |
| APAC          | <b>25%</b> |

| RESPONDENT LEVEL  |            |
|-------------------|------------|
| C-level executive | <b>23%</b> |
| Vice president    | <b>34%</b> |
| Director          | <b>43%</b> |

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