## **Automated Software Testing Adoption** and Trends



how integrated is it in modern software engineering organizations, and which trends stand to impact it? Find out. **One-Minute Insights:** 

Respondents commonly automate API testing and use automated testing

Many respondents' organizations chose to automate testing to improve

struggle with implementation

and that we will see a change in QA headcount and daily responsibilities

One-Minute Insights on timely topics are available to **Gartner Peer Community** members.

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their organization's automated software testing

A range of automated software testing types and cadences are in place

45%

40% Performance testing

Integration

testing

Data collection: May 27 - June 27, 2023

## organization currently use? Select all that apply. 56% API testing Graphical user interface (GUI) testing 30% | 38% Accessibility testing 29% | Regression testing 27% |

Data-driven testing 25% | Unit testing 24% | Black-box testing 20% | Security testing (e.g., penetration testing) 19% Scalability testing 12% | Smoke testing 9% | Stability testing 9% | Recovery testing 9% | Gray-box testing 8% | White-box testing 6% | Can not say 6% | Type(s) of automated software testing not listed here 4% | Keyword-driven testing 3% | Don't know 3% | Other 0%

API testing (56%), integration testing (45%) and

common types of automated software testing

currently in use in respondents' organizations.

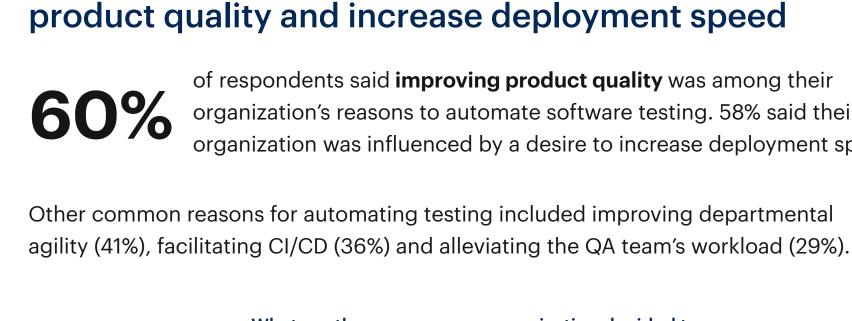
What type(s) of automated software testing does your

performance testing (40%) were among the most

of respondents automate software testing continuously during their development cycle. Other common timing options included at set milestones (38%), like prior to a commit, and at set intervals (32%), such as a specific number of days.

38% 32% 27% 15% Can not say 5% | Don't know 2% | Cadence not listed here 2% | Other\* <1% n = 248

"Automated testing is necessary to find bugs and security issues in a timely,



Address bugs/product issues 26% | Follow industry standards 23% |

of respondents said improving product quality was among their

organization's reasons to automate software testing. 58% said their

organization was influenced by a desire to increase deployment speed.

Free up resources to expand product 19% | Reduce engineering spend 18% |

Reduce headcount 18% | Improve cybersecurity 15% | Can not say 3% |

Don't know 3% | Reason(s) not listed here 1% | Other\* <1%

\*Other includes: "Reduce human errors"

"[Automated software

testing is] essential to ensure

software development can

scale, that changes can be

released rapidly and to be

sure many tests are covered

Leaders report higher test accuracy after automating testing, but some struggle with implementation Higher test accuracy (43%), increased agility (42%) and wider test coverage (40%) are among the most significant benefits respondents have seen at their organizations since automating testing. What are the most significant benefits you have seen in your organization since automating software testing? Select up to three. 43% 42% 40% 35% 30%

Better

simulation

environment

costs

commonly reported.

Hard-to-define ROI 23% |

execution of automated script"

"There is an increasing need to have automated testing. The

and to maintain it. AI can positively impact the capability of

challenge is the upfront investment to implement such framework

High maintenance costs 16% |

Fewer bugs in final product 27% Better scalability **25**% Better adherence to CI/CD 19% | More positive developer experience 18% | Better ROI on software products 12% Can not say 2% | Other\* 1% | Benefit(s) not listed here <1% n = 248Reduced \*Other includes: "Faster TTM [time to market]," "Too soon to say"

When asked about the most significant challenges

implementation (36%), automation skill gaps (34%)

and high upfront costs (34%) were among the most

to automated software testing deployment in

What are the most significant challenges you have

deployment in your organization? Select up to three.

Product complexities make it hard to automate testing 19% |

Lack of executive buy-in 7% | Cybersecurity problems 6% |

Lack of employee buy-in 4% | Challenge(s) not listed here 2% |

experienced with automated software testing

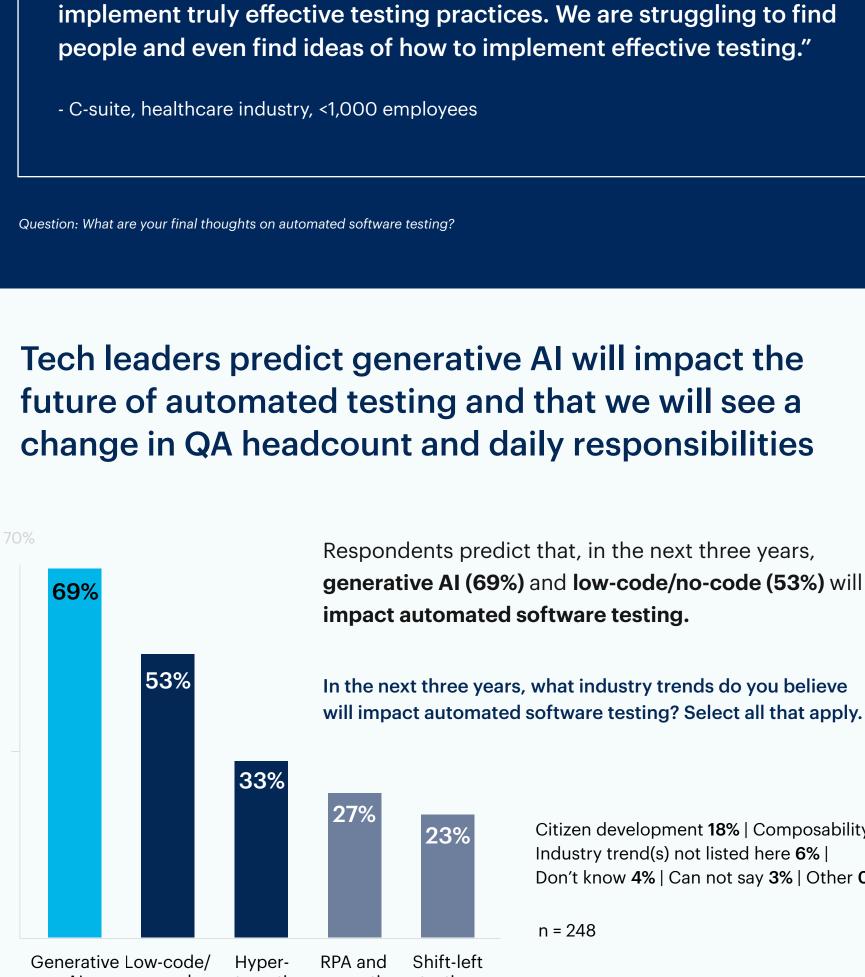
Lack of trust in automation tools/vendors 21% |

I have not experienced any challenges 10% |

Can not say 2% | Don't know 2% | Other\* <1%

\*Other includes: "Firewall or internal security preventing

respondents' organizations, struggles with



Impact(s) not listed here 4% | Don't know 3% | Can not say 2% | Other 0% Considering automated software testing's potential impact on the QA department or roles, respondents believe that, in the next three years, we will see a reduction in QA headcount (40%) and a fundamental change to QA's daily responsibilities (40%). In the next three years, how do you believe automated software testing will impact the QA department/roles? Select all that apply. Reduction in QA headcount 40% Fundamental change in daily 40% responsibilities of QA team More outsourcing of QA team 29% Hiring additional 29% QA engineers 28%

"The [automated software testing] process still has a way to go to

may completely take over the function entirely."

- C-suite, educational services industry, <1,000 employees

completely replace individuals, but within 5 years and certainly 10 it

continuously throughout the development cycle product quality and increase deployment speed Respondents report higher test accuracy after automating testing, but some

Acceptance testing 33% Load testing n = 248Continuously At set milestones (e.g., before a commit or deployment) At set intervals (e.g., a certain number of days or weeks) During a specific phase in the development cycle (e.g., the testing phase) We don't automate software testing during the development cycle

\*Other includes: "On new sprint"

efficient manner. We would be much slower to release new software without it." - Director, other services industry, <1,000 employees Question: What are your final thoughts on automated software testing?

60% 58% Improve Increase product quality deployment speed

despite human restrictions on headcount, working hours and accuracy." - C-suite, retail industry, 1,000 - 5,000 employees Question: What are your final thoughts on automated software testing?

Higher test Increased Wider accuracy agility testing coverage of user-like

34% High upfront

costs

31%

Inaccuracies

in automated

34%

Automation skill gaps among

employees

36%

**Implementation** 

26% testing Lack of integration n = 248

no-code automation semantic automation Thinking only of generative Al's potential impacts on automated software testing in the next three years, respondents believe it will predict common issues or bugs (57%), analyze test results (52%) and suggest error solutions (46%).

Staffing QA team with internal promotions Elimination of QA department/role 23% | I don't believe it will 7% | Can not say 3% | Don't know 3% | Impact(s) not listed here 2% | Other 0%

"Automated testing is going to fundamentally change the role of QA testing in [the] SDLC process and make the process a lot more result analysis."

Region

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**Respondent Breakdown** North America 35% **Job Level** 

36% Director C-Suite 26% 27% VΡ 14%

neither endorses it nor makes any warranties about its accuracy or completeness. Source: Gartner Peer Community, Automated Software Testing Adoption and Trends survey

Tech leaders predict generative AI will impact the future of automated testing

Respondents: 248 IT and software engineering leaders involved in managing and/or making decisions related to

Automated software testing reduces human error and speeds up efficient delivery, but

**APAC 41%** 

40%

n = 248

<1,001 employees 39% 1,001 - 5,000 25% employees

**EMEA 23% Company Size** 24% 12%

10.001+ employees 5,001 - 10,000 employees

Manager Note: May not add up to 100% due to rounding Respondents: 248 IT and software engineering leaders involved in managing and/or making decisions related to their organization's automated software testing This content, which provides opinions and points of view expressed by users, does not represent the views of Gartner; Gartner

When during your development cycle do you automate software testing? Select all that apply. 40% 40%

"This technology is still in its infancy. I'm anxiously looking forward to the coming advances in automated testing in the coming months and years." - VP, finance industry, 5,000 - 10,000 employees Organizations automate software testing to improve

> What are the reasons your organization decided to automate software testing? Select all that apply. 41% 36% 29% Facilitate Improve Alleviate departmental CI/CD workload for QA team agility n = 248

> > "It's easily one of the most

in any Software

important hygiene practices

**Development Environment.** 

automated testing, you're

essentially flying completely

blind to your most important

Without some form of

workflows breaking."

- Director, consumer goods

industry, <1,000 employees

Simplified SDLC 15% | Improved cybersecurity 14% | I haven't seen any benefits 6% | Don't know 3% |

automated software testing." - Director, professional services industry, 10,000+ employees "The practice has lost a lot of its sophistication and effective tooling over the past decade or two. The push towards developer-led testing has reduced the availability of qualified resources who can help implement truly effective testing practices. We are struggling to find people and even find ideas of how to implement effective testing."

Citizen development 18% | Composability 13% |

Don't know 4% | Can not say 3% | Other 0%

Industry trend(s) not listed here 6% |

n = 248

In the next three years, how do you think generative AI will impact automated software testing the most? Select up to three. 57% **52%** 46% 43% 34% Recommend Predict common Analyze test Suggest error Create issues/bugs solutions efficient results specific tests feedback loops Keep tests up to date 28% | Create tests 27% | I don't think it will 5% | n = 248

23%

Shift-left

testing

robust and agile in the short run. In the long run, in combination with Generative AI, the level of automation may not be only limited to testing execution but will expand to script generation and test - Director, manufacturing industry, 10,000+ employees Question: What are your final thoughts on automated software testing? Want more insights like this from leaders like yourself? Click here to explore the revamped, retooled and reimagined Gartner Peer Community. You'll get access to synthesized insights and engaging discussions from a community of your peers.