COMPANIES ARE FAILING TO WALK THE QUALITY APPLICATION TALK

A Global Survey of Executives and IT Professionals

December
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Introduction

This paper reviews key findings from a global primary research survey with executives and IT professionals. The research focused on understanding the business value of application quality and the processes that companies employ to ensure it. The research also investigated the adoption of DevOps and the incorporation of automated testing within the CI/CD pipeline and its impact on application quality.

This paper reviews a real worldview perspective of application quality practices and processes, and whether they are aligned with companies' expectations and objectives. The report covers which testing is actually done, at what phases, and where corners are cut in the quality process to accelerate deployment velocity. Participants were asked if AI/ML could deliver improvements in the application lifecycle and, if so, where it should be deployed.

Executive Summary

This research finds that effectively every company (98%) believes better application quality delivers a superior customer experience. Nearly 9 out of 10 state that application quality is a key differentiator for their company, and that it is everyone's responsibility.

However, a large majority of executives and IT professionals shared they often sacrifice quality for faster release velocity. In fact, nearly all surveyed report utilizing poor quality and testing practices, such as allowing incomplete requirements and testing documents, lacking key testing data, skipping tests, and failing to perform full end-to-end testing. Only 28% perform all 5 basic types of testing (unit, functional, performance, integration, customer) with 2 out of 10 actually releasing applications without functional testing. Not surprisingly, some of those surveyed do not employ the critical feedback loop of using production and customer issues to create new test scenarios which prevent it from occurring again.

New development and deployment practices usher in change, as 92% are adopting DevOps. Technology professionals share this is driving the strategic use of automation for continuous CI/CD, but as companies adopt DevOps and CI/CD, 60% indicated this is displacing the typical testing phase before deployment. However, by the exact same margin we see the positive trend of companies inserting automated testing within the CI/CD processes.

The situation is clear. Application quality delivers direct value to the customer and the business and is supposed to be a priority for everyone, but the walk is not matching the talk as companies are cutting corners and consciously sacrificing quality. The migration to DevOps with automated testing holds significant opportunity and leveraging AI/ML should make the testing smarter, more efficient, and deliver better applications to customers faster and allow bad habits and practices to be broken so the quality edict and actions are aligned.

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Key Findings

- **Application Quality is A Competitive Differentiator that Makes Customers Happier**
  - 98% shared higher application quality delivers a superior customer experience
  - 85% state application quality is a competitive differentiator
  - 88% indicate that quality is everyone's responsibility

- **Testing and Quality Practices and Actions Fall Short**
  - 71% reveal being pressured to release applications at the expense of quality
  - 87% exhibit poor quality practices
  - Only 28% perform all 5 basic testing approaches, and 22% of companies release applications without functional testing
  - Approximately 1 out of 4 lack consistent feedback loop for continuous quality improvement

- **Moving Quality Forward with DevOps, Automation, and AI/ML**
  - 92% have started DevOps practices
  - 60% no longer have a dedicated testing phase, and only 11% of companies test at all 5 stages
  - 60% have automated testing as part of the CI/CD process
  - 99% agree AI/ML delivers numerous benefits for automating and optimizing testing
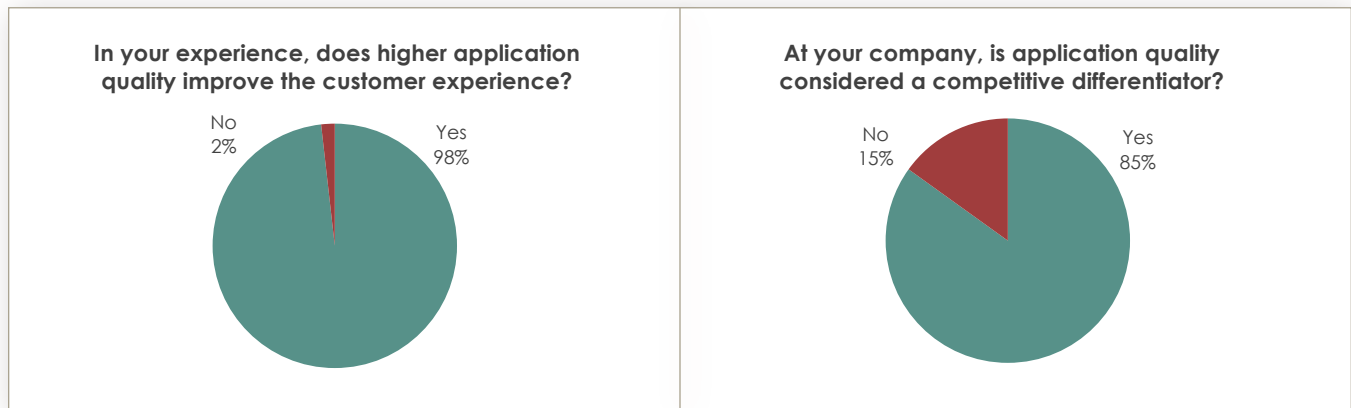
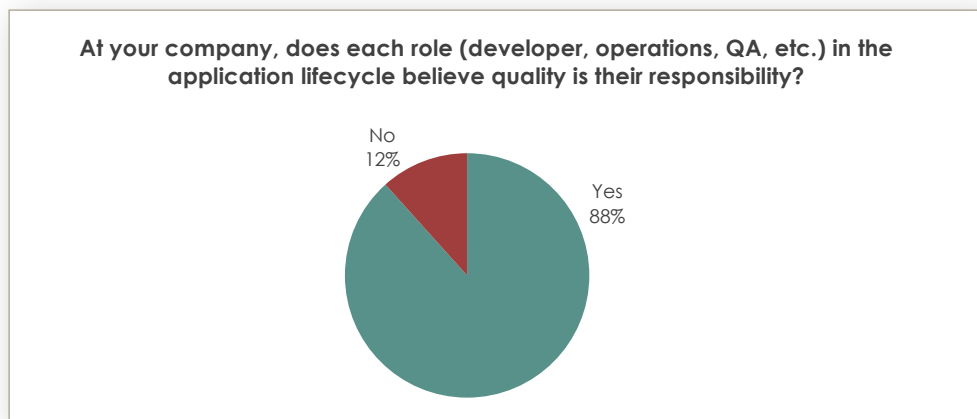Dimensional Research | December 2021

Detailed Findings

Application Quality Differentiates and Makes Happy Customers

For most companies, a tremendous amount of their business is conducted via applications, and a majority of those applications interface with the customer. Applications facilitate purchases and transactions but also commonly answer questions and provide support options, and thus most interactions between a company and the customer are through their applications. This research finds that 98% of executives, IT, and quality professionals state that application quality improves the customer experience. And 85% of companies shared that application quality is a competitive differentiator for them by delivering a positive experience to their customers.

In your experience, does higher application quality improve the customer experience?

No 2%   Yes 98%

At your company, is application quality considered a competitive differentiator?

No 15%   Yes 85%

Application Quality Is Everyone's Responsibility

With application quality directly affecting the customer, and thus the business, it was not surprising that 88% of participants indicated that their company instills a philosophy that application quality is owned by everyone. This is a migration from years ago, where quality was the QA teams' responsibility. Now development through operations is expected to ensure high application quality.

At your company, does each role (developer, operations, QA, etc.) in the application lifecycle believe quality is their responsibility?

No 12%   Yes 88%
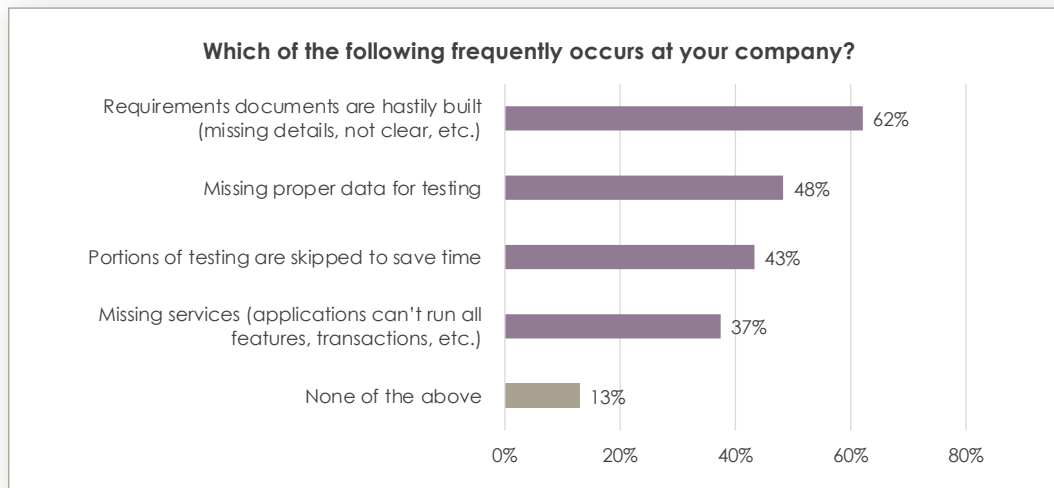
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In Reality, Most Release Applications at the Expense of Quality

However, the reality is 71% of those surveyed indicated over the last 12 months they have been pressured to release an application and sacrifice quality to do it. This indicates the rhetoric of an application quality philosophy is not actually how companies are in fact operating consistently, creating risk to customer value and the company.

Over the last 12 months, have you felt pressured to release an application at the expense of quality?

No
29%

Yes
71%
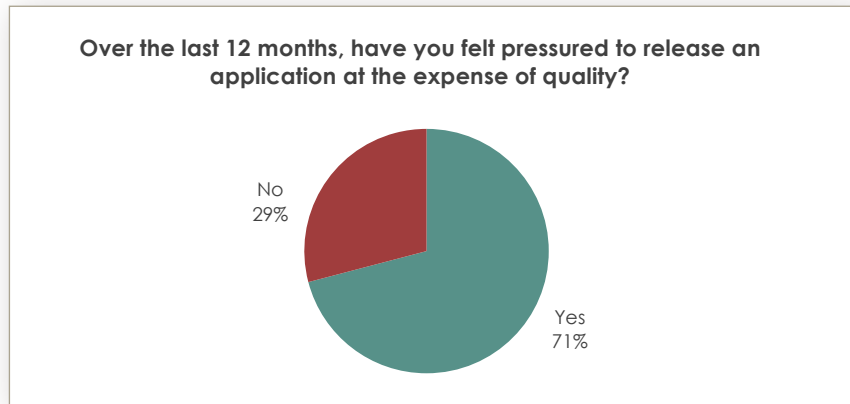
Companies Allowing Bad Quality Practices to Continue

To better understand how companies really operate their quality process we asked about the prevalence of poor quality practices. Unfortunately, 87% of those surveyed indicated they frequently fall into these poor habits. The poor practices are led by 62% who cite they are creating and relying on incomplete requirements documents that not only define new features but how to test them to ensure they are built properly and without error. The next two problem areas involve missing proper test data (48%) and skipping tests to save time (43%). Quality can't be ensured when the application simply isn't being properly tested. And lastly, at 37%, are missing necessary services, which in today's use of modern applications means teams are unable to perform full end-to-end transaction testing, essentially using production teams, users, and customers as guinea pigs.

Which of the following frequently occurs at your company?

Requirements documents are hastily built (missing details, not clear, etc.)	62%
Missing proper data for testing	48%
Portions of testing are skipped to save time	43%
Missing services (applications can't run all features, transactions, etc.)	37%
None of the above	13%

0%   20%   40%   60%   80%
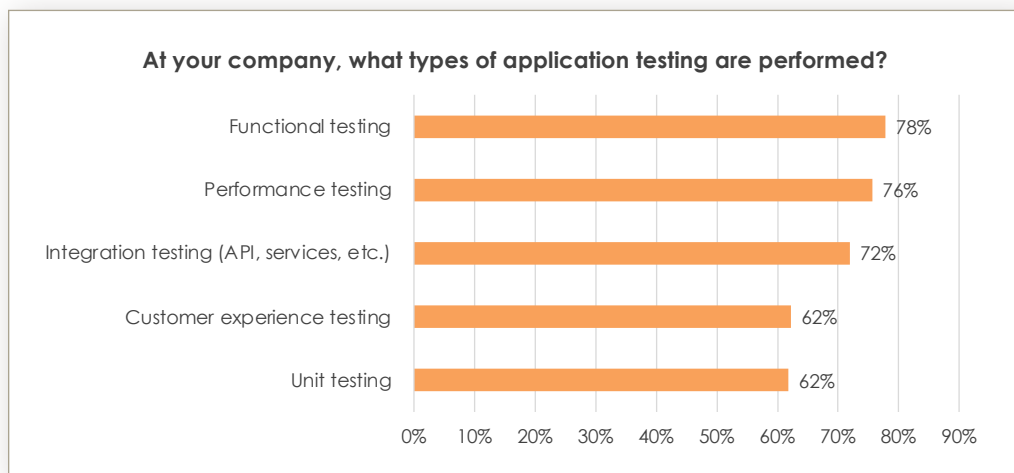
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Barely a Quarter of Companies Perform Basic Core Testing

Given the preceding bad quality habits that continue to persist, the research sought to confirm what actual testing is being performed. At first glance, the chart below seems quite positive, with a lot of testing being down. However, analyzing the data it was discovered that astonishingly only 28% of the companies surveyed are doing all five of the core testing disciplines: functional, performance, integration, customer experience, and unit testing.

Looking at what companies are not doing is even more revealing. For example, 22% of companies are releasing applications without even basic function testing to ensure it works. And nearly 4 in 10 companies are not doing unit testing, which feels like the very old days of waterfall development where development didn't own quality, instead of today's reliance on DevOps teams utilizing Agile and CI/CD methodologies that shifts quality earlier in the lifecycle.

Perforce Application Quality and Testing

Perforce Software's application quality and testing products help global enterprises improve visibility, reduce risk, and embed quality across the development lifecycle, to ensure stellar customer experiences at scale. Perforce's growing application quality and testing portfolio includes Perfecto (mobile and web quality), Helix QAC and Klocwork (static application security testing) and the BlazeMeter Continuous Testing Platform.

At your company, what types of application testing are performed?

Testing Type	Percentage
Functional testing	78%
Performance testing	76%
Integration testing (API, services, etc.)	72%
Customer experience testing	62%
Unit testing	62%

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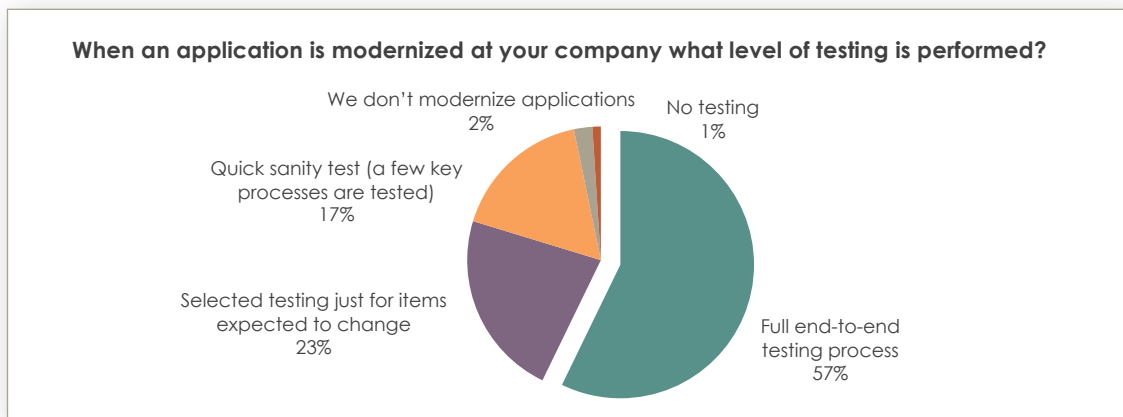# COMPANIES ARE FAILING TO WALK THE QUALITY APPLICATION TALK

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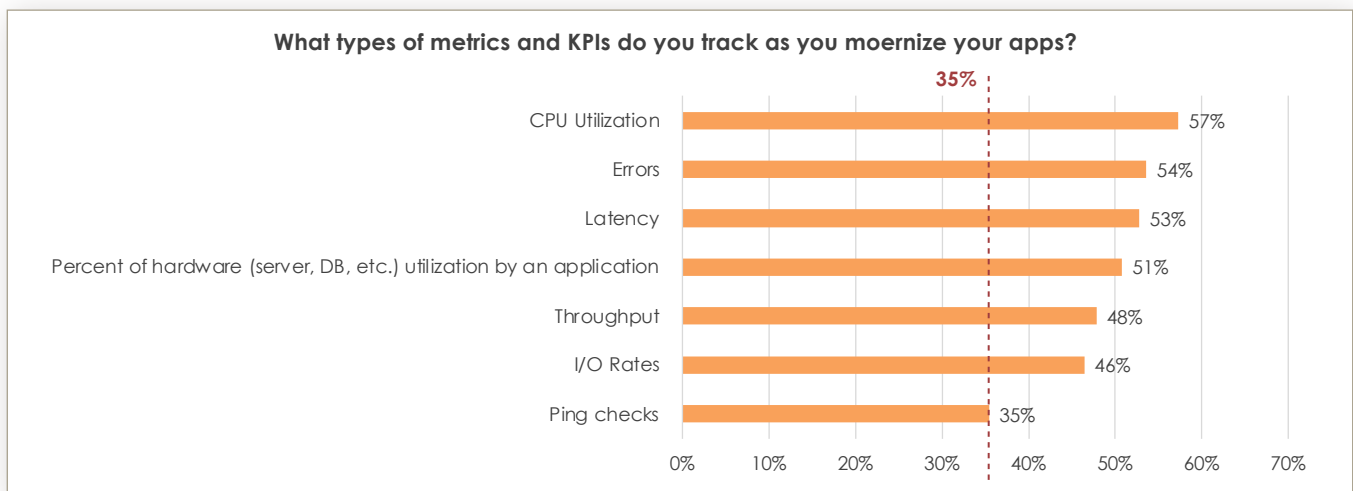
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Barely Half Fully Testing Modernized Applications

Today many companies are modernizing their applications for many reasons that include faster development times for new features and capabilities, as well as easier deployment in cloud environments. When asked about modernizing applications, only 2% indicated they are not doing it. With nearly all companies modernizing applications, the research uncovered more bad habits as just over half (57%) fully test the modernized application end-to-end. All others employ some short-cutting activity and hope they catch the defects as a proxy for thorough testing. Release velocity again appears to trump quality.

When an application is modernized at your company what level of testing is performed?

- We don't modernize applications 2%
- No testing 1%
- Quick sanity test (a few key processes are tested) 17%
- Selected testing just for items expected to change 23%
- Full end-to-end testing process 57%

Low Observability and Quality Metrics on Modernized Applications

With nearly every company modernizing applications with questionable testing practices, the research investigates if key metrics and KPIs were used as a quality indicator before and after the modernization process. It was expected that high observability would counter some of the poor quality practices by providing early indicators. But only 35% reported monitoring the basic application metrics, and just 57% monitor CPUs, which was the top metric monitor. Thus, applications are being modernized often without proper testing and then companies subsequently have low visibility into their operations.

What types of metrics and KPIs do you track as you moernize your apps?

Metric	Percentage
CPU Utilization	57%
Errors	54%
Latency	53%
Percent of hardware (server, DB, etc.) utilization by an application	51%
Throughput	48%
I/O Rates	46%
Ping checks	35%

(Reference line at 35%)

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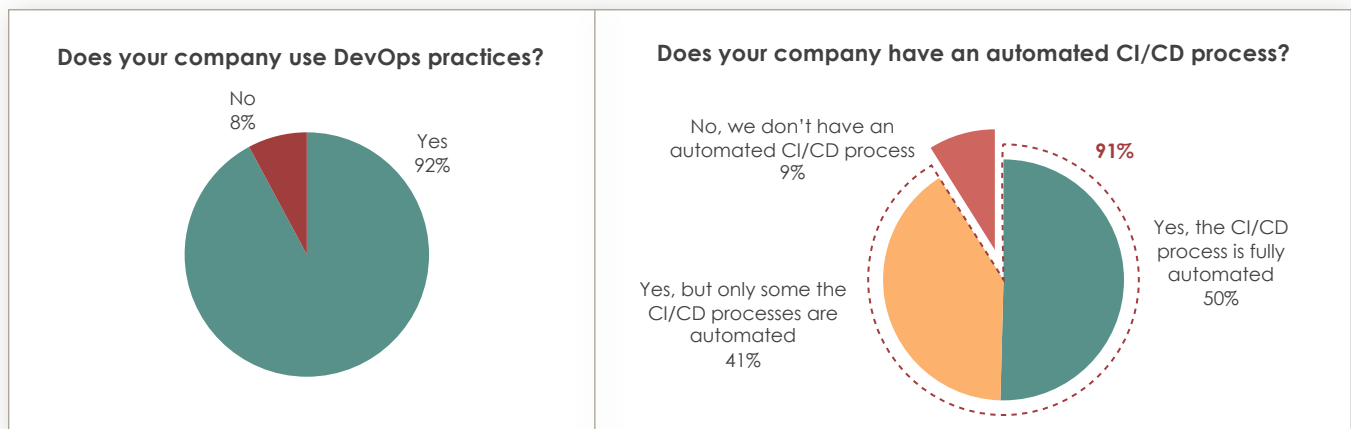
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Inconsistent Feedback Loop for Continuous Quality Improvement

With questionable quality applications making it into production and with low observability also common, the research wanted to understand if companies were attempting to employ continuous quality processes. 28% of companies provided a surprise in stating that quality issues rarely or just "some of the time" provide feedback into the quality process to ensure the same defect doesn't make it back into production and back to customers. Perhaps just as surprising is that only 32% have a consistent quality feedback loop every time.

At your company, if an issue is found in production, how often are test cases created (modified) to test for that issue?

Always	Most of the time	Some of the time	Rarely
32%	40%	22%	6%

28%
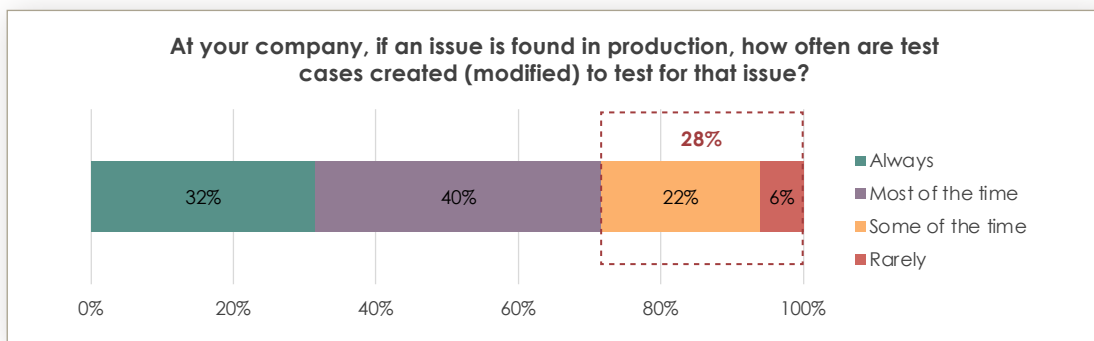
High Adoption of DevOps with Automated CI/CD Processes

Many of the findings thus far have indicated poor quality habits reminiscent of a waterfall development approach. However, the research finds that 92% of these companies are in fact utilizing a DevOps methodology. For an initial gauge of DevOps maturity, participants were asked if they have an automated CI/CD process. A very positive finding shows that 91% indicate they have either a fully automated process or are on the path to get there.

Does your company use DevOps practices?

No 8%

Yes 92%

Does your company have an automated CI/CD process?

No, we don't have an automated CI/CD process 9%

Yes, but only some the CI/CD processes are automated 41%

Yes, the CI/CD process is fully automated 50%
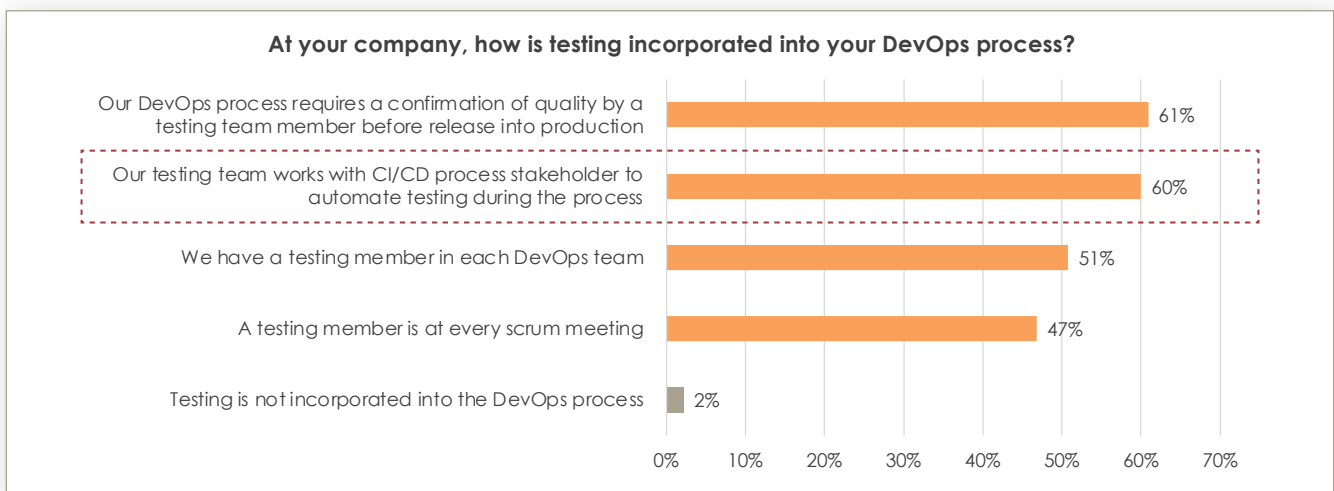
91%

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Testing Not Occurring at All Key Select Lifecycle Phases

Earlier in this report we had asked which testing was performed and were provided with some disappointing results. Now the research investigated when testing was performed. Most (74%) performed testing during development, and fewer, at 61%, performed testing after each build, with just 57% testing the production candidate. Less than half (44%) do any post-deployment production testing, and only 40% have a discreet testing phase in their application lifecycle. Again, it looks like a gamble is being taken on quality, as only 11% of those surveyed actually test at all 5 key stages.

For your company, at which stages of the application lifecycle is testng performed?

Stage	Percentage
During development (before a build is completed)	74%
After each build	61%
After the production candidate is built	59%
After it is in production	44%
We have a dedicated testing phase in our product lifecycle	40%
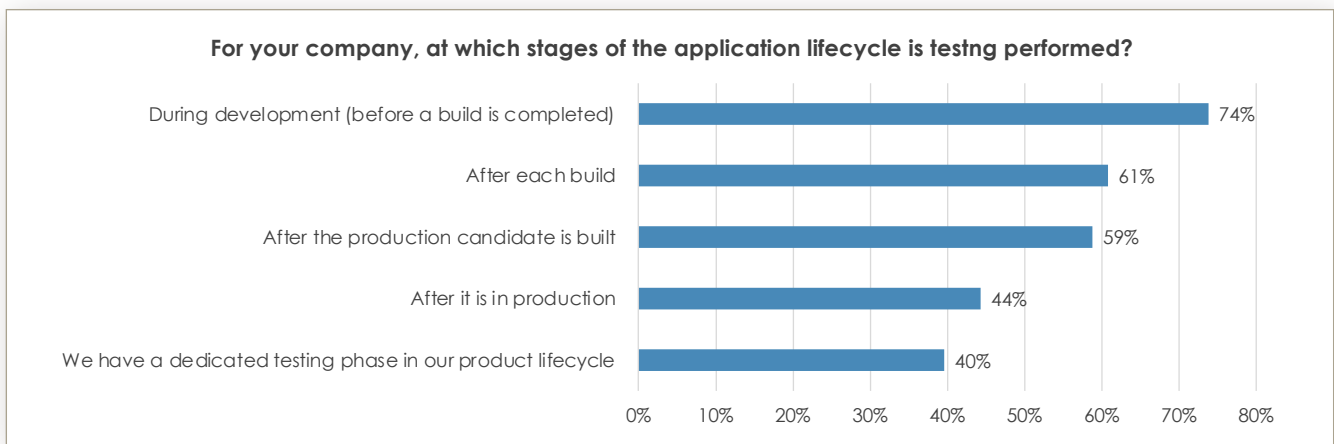
Automated Testing Growing as Key Component of CI/CD Processes

When asked how testing and quality are incorporated into the DevOps process specifically, only 60% indicated testing is baked into their automated CI/CD process. This directly corresponds to 40% that shared they still have dedicated testing phase. Thus, when companies add automated testing to their CI/CD process, it replaces the dedicated testing phase. And while the chart below initially indicates 98% of companies have some quality check in their DevOps process, it is sobering to think that 40% of companies do none of these to ensure application quality.

At your company, how is testing incorporated into your DevOps process?

Option	Percentage
Our DevOps process requires a confirmation of quality by a testing team member before release into production	61%
Our testing team works with CI/CD process stakeholder to automate testing during the process	60%
We have a testing member in each DevOps team	51%
A testing member is at every scrum meeting	47%
Testing is not incorporated into the DevOps process	2%

Increasing Efficiencies, Improving Product Quality and Customer Value

Much of the preceding in this report has indicated gaps in the quality process and bad habits. Participants were asked if they believe quality and automated testing could benefit from AI/ML. In short, 99% of executives and technology professionals state there are strong application benefits to AI/ML and the optimization it can bring. Topping the list is improved quality (71%) followed by faster testing (60%). Perhaps with AI/ML the tradeoff for quality at the expense of speed can stop. With the prospect of better quality, we find 57% citing improved customer experience and more testing throughout the application lifecycle (53%). Faster releases (51%), smoother build and release process (50%), and more time for testers (40%) rounded out the last key benefits AI/ML can deliver.
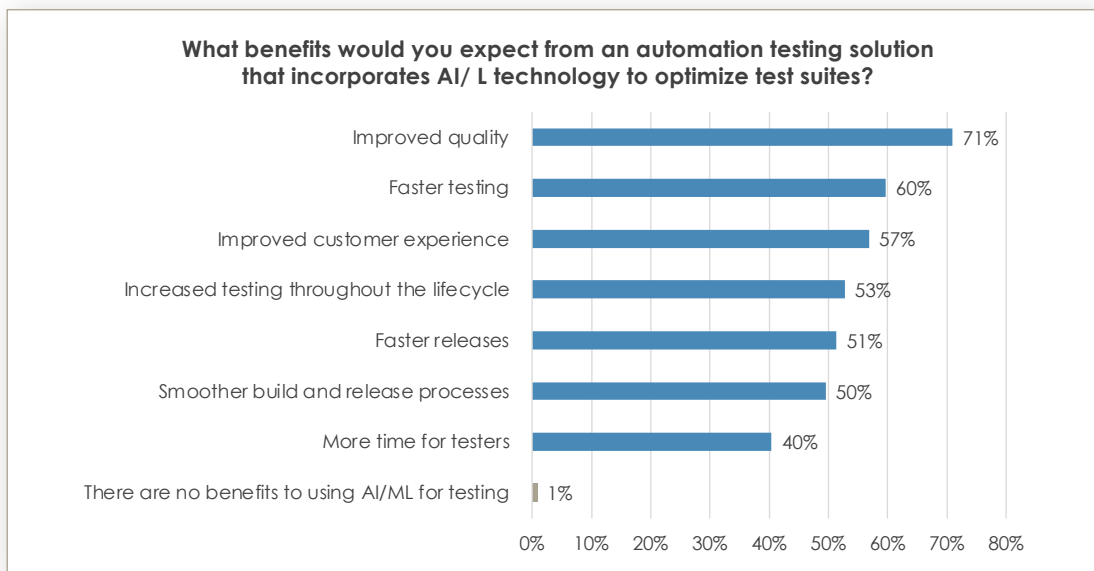
What benefits would you expect from an automation testing solution that incorporates AI/ L technology to optimize test suites?

Benefit	Percentage
Improved quality	71%
Faster testing	60%
Improved customer experience	57%
Increased testing throughout the lifecycle	53%
Faster releases	51%
Smoother build and release processes	50%
More time for testers	40%
There are no benefits to using AI/ML for testing	1%

Conclusion

Companies know and openly state application quality makes happier customers. And happier customers remain loyal and buy more. For many businesses, their applications are the face of the company and, like a product for their company, it should be a key differentiator which results in happier customers and thus completes the loop.

But this research finds companies' actions don't match this sentiment. They are intentionally and consciously cutting corners to save time and effort, directly at the expense of quality. It is a systemic problem in that companies are not doing all the right testing at all the key lifecycle phases. And the problem continues for most as the feedback loop for issues found in production and discovered by customers are not consistently fed back into the process to prevent it from happening again.

Hopes that modern applications and DevOps practices with automated CI/CD process would remedy these issues, remain just that, hopes. However, an AI/ML automated testing solution that is locked into the CI/CD process holds a strong promise of achieving higher quality applications without adding time.

Companies need to address the processes and commit to continuous quality process, where everyone really owns the quality and are responsible for it. The right tools need to be in place to reinforce the process, enable quality, measure quality, and break the bad habits that are prevalent in companies today. Their customers will love them for it.

Survey Methodology

Executives and IT professionals representing all seniority levels at enterprise companies were invited to participate in a survey on their company's testing and application quality processes.

A total of 505 qualified participants completed the survey. All participants had direct responsibilities for application development, quality or testing. Participants were from 5 continents representing a global viewpoint. The survey was administered electronically, and participants were offered a token compensation for their participation.

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Dimensional Research provides practical marketing research to help technology companies make their customers more successful. Our researchers are experts in the people, processes, and technology of corporate IT and understand how IT organizations operate. We partner with our clients to deliver actionable information that reduces risks, increases customer satisfaction, and grows the business.

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