



"Our mission is to help every company deliver perfect digital experiences in an ever-evolving and complex world"

Accelerate Application Development With Continuous Testing

Understand how continuous testing can speed up the development process of applications and HeadSpin's role in continuous testing

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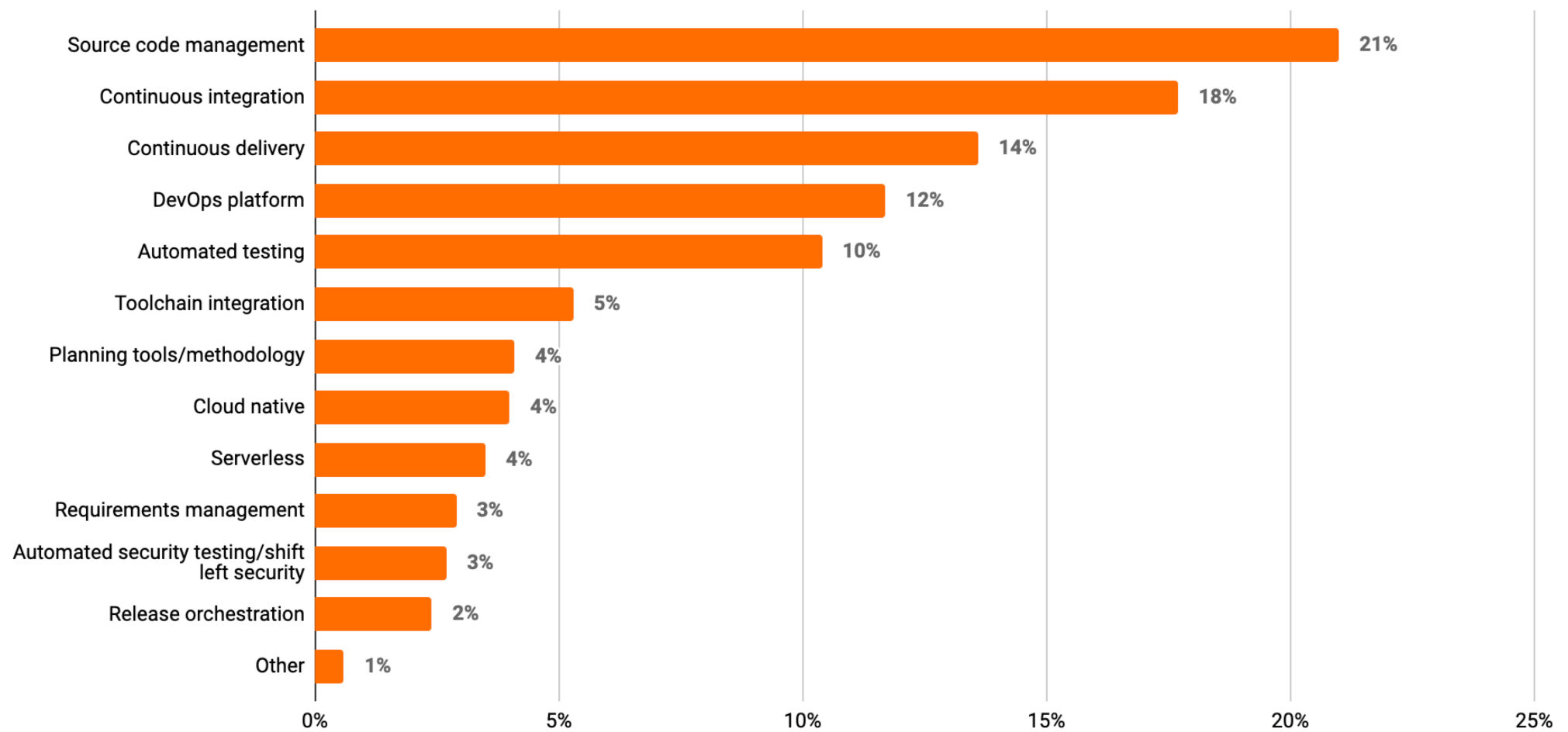
Introduction

Organizations realize there is a need to test their technology platforms and improve the management of their connections with people, machines, and information.

Traditional testing involves software being handed off from one team to another, with a project having clearly defined development and quality assurance (QA) phases. The QA team would require ample time to ensure quality, and quality is generally prioritized over the project schedule.

However, businesses currently need faster software delivery to end users. In a continuous DevOps process, a release candidate continually moves from development to testing to deployment. Thus, continuous testing empowers organizations to seamlessly integrate their software with legacy systems and boost business efficiencies.

Changes Introduced in the Software Development Process in Organizations, Global, 2021



Continuous testing has been a critical enabler to streamline software development and automated testing practices to deliver software updates faster to keep up with DevOps. By shifting left, developers can integrate automated testing into the stages of the development cycle, find bugs earlier in the process, and improve the quality of each software release candidate.

In this whitepaper, we'll mainly discuss how continuous testing can speed up the development process of applications/software and HeadSpin's role in continuous testing.

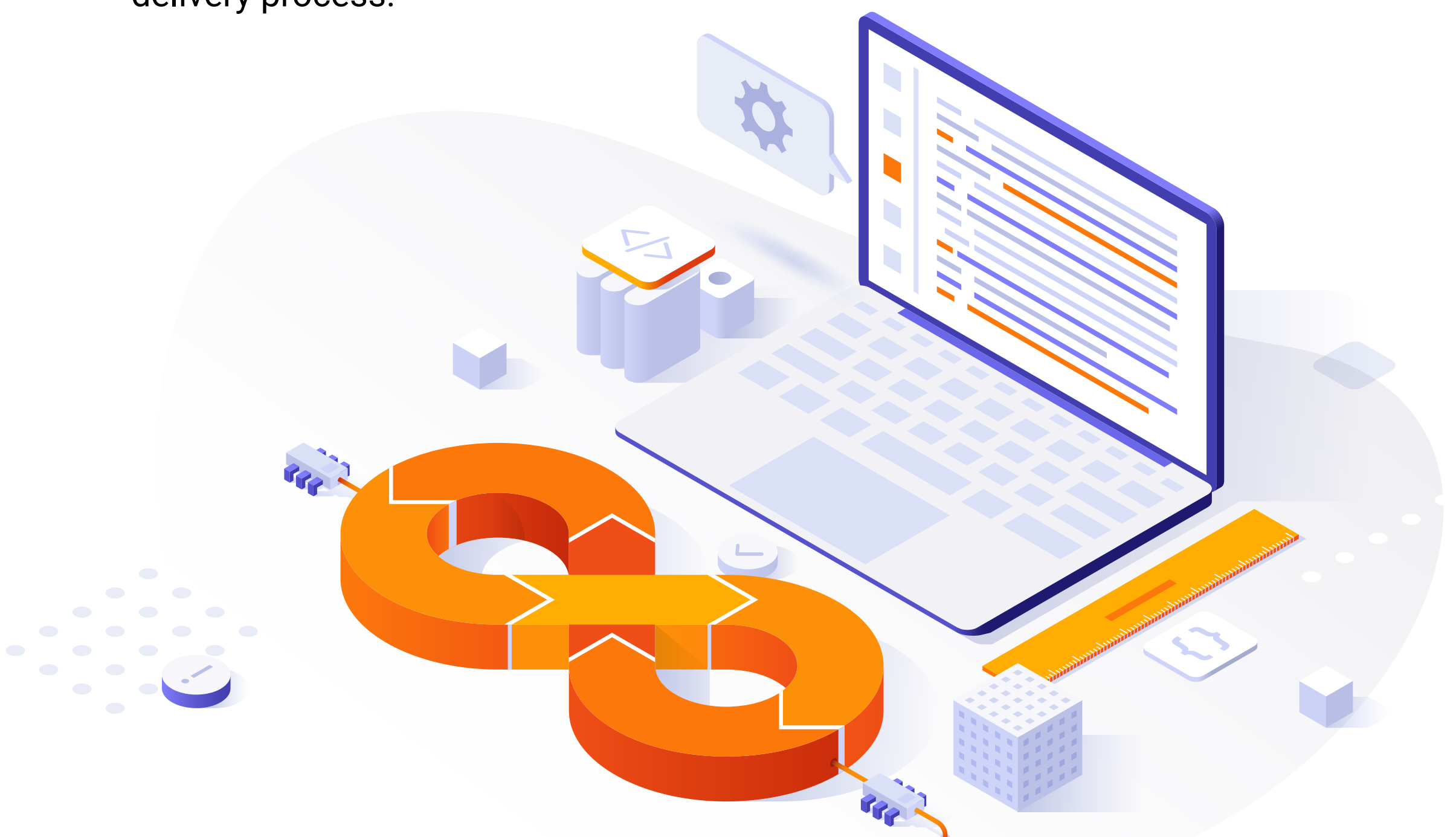
Why is Continuous Testing Important in DevOps?

Today's customers demand a seamless user experience. Applications need connectivity and dependence between systems, processes, and infrastructure. Testing various applications, products, and services can pose a big challenge, as testing must ensure that high-quality applications are delivered.

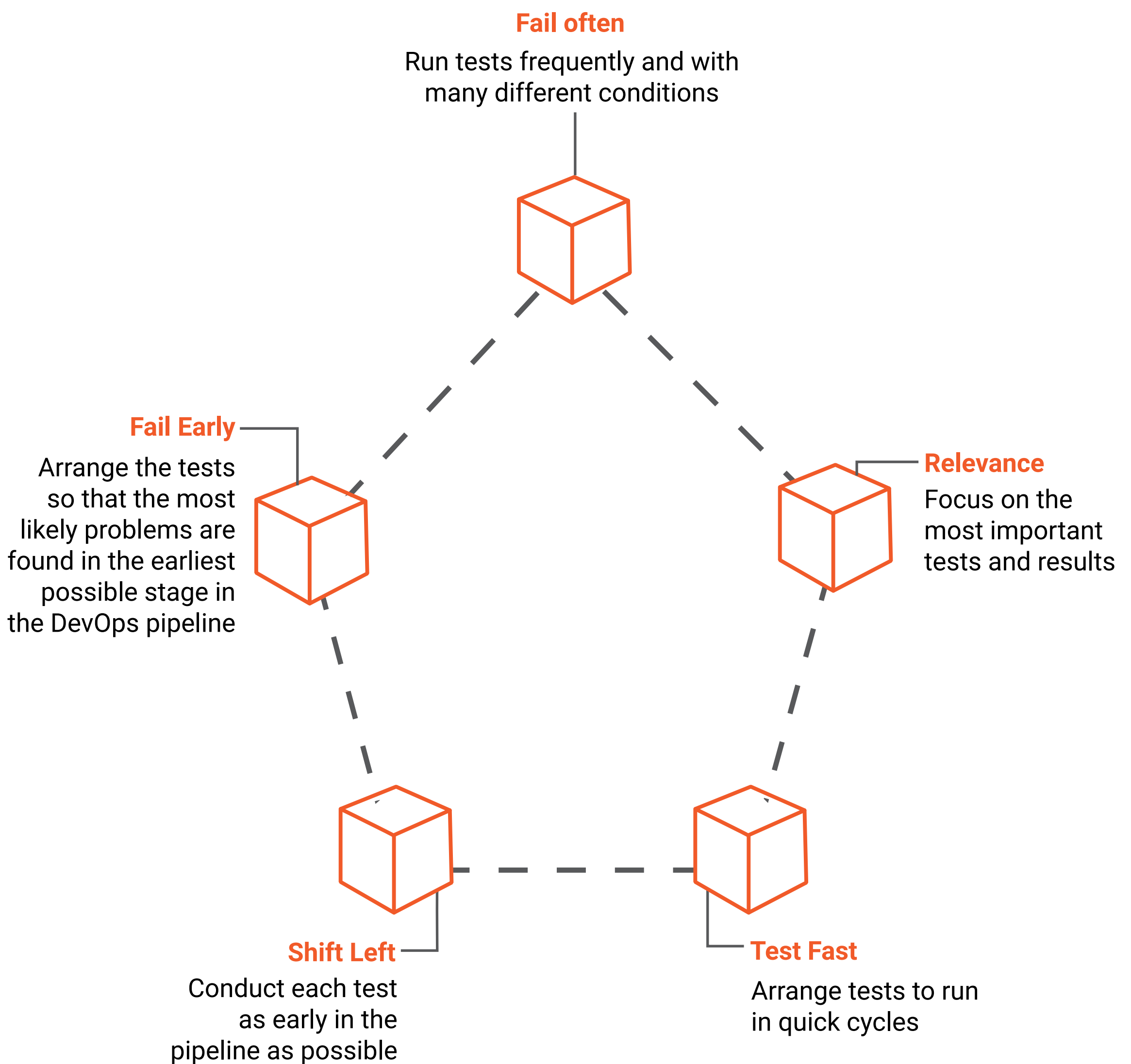
Automated tools help developers make better release decisions with in-the-moment feedback about critical software defects. Continuous testing plays an important role in the continuous delivery process. It implicates the usage of methods and concepts of agile development for the testing and QA process, thus offering a more efficient testing process. It needs automated end-to-end testing methods that integrate existing development processes while excluding errors and enabling continuity throughout SDLC.

Before a software tool is released in the market, continuous testing helps software vendors gain confidence that code updates will have maximum impact with minimal risk to their business's bottom line.

Moreover, when implemented diligently, continuous testing allows flawless continuity in the delivery cycle. Integrating a fully automated continuous testing process into the SDLC is the most effective solution for a successful continuous delivery process.



Organizations have been continuously working to reduce the release time of the product and deliver it with the optimum quality with the help of continuous testing. The five principles that will help organizations enhance their DevOps test practices are shown in the figure below.

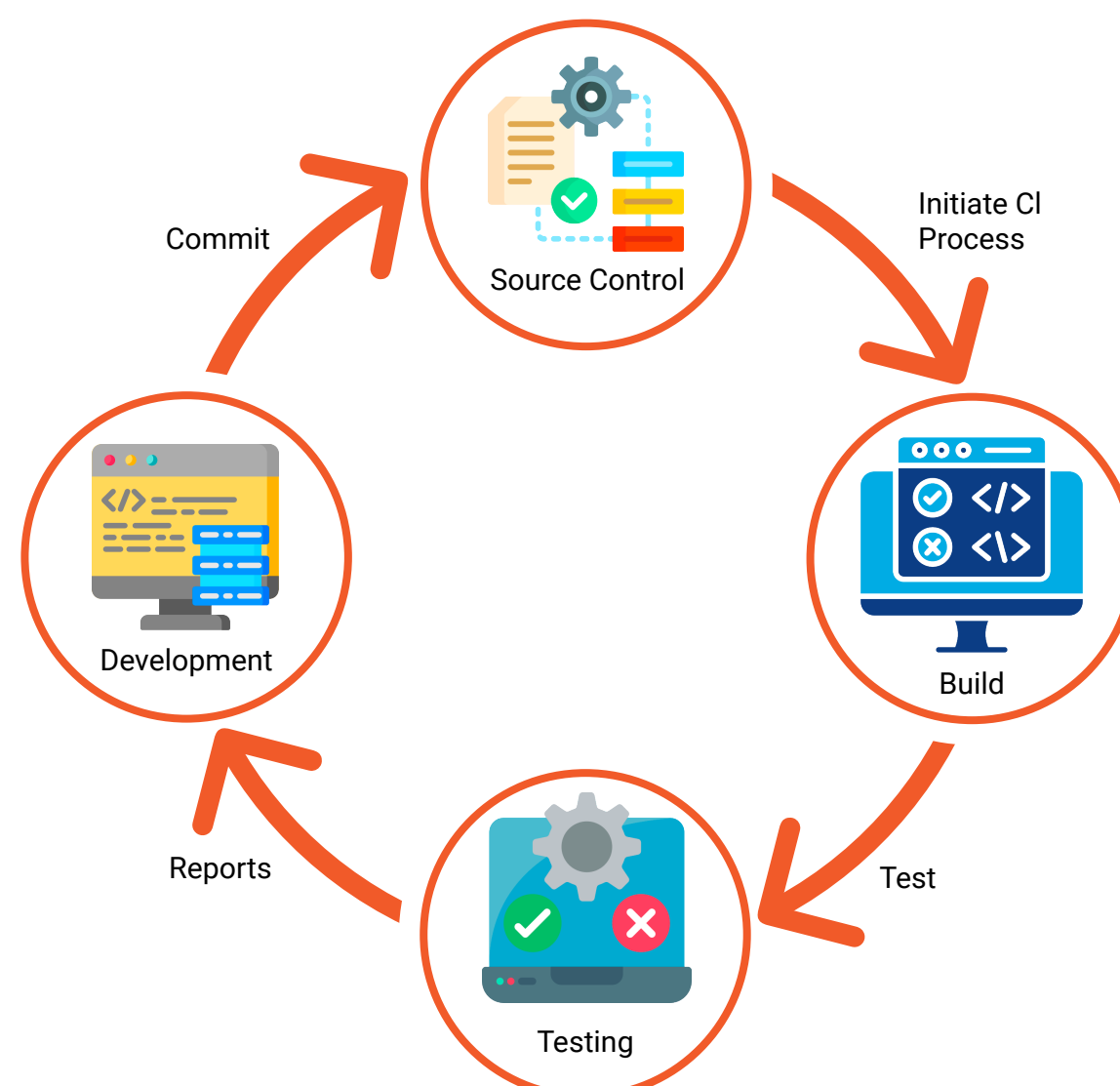


Benefits of Using Continuous Testing in Application/Software Development

Continuous testing is one of the strategies that has helped many companies scale up their app testing and speed up the SDLC. The key to building quality apps fast is to ensure that there is a continuous feedback loop that is built around different teams.

This type of testing allows the teams to run tests both manually and through automation to validate the functionality under development in the delivery process. It enables testers and developers to work alongside each other throughout the entire development and deployment process, ensuring that the updates or functionalities are released fast without any delays. Let's look at the benefits associated with continuous testing. A few of them are listed below:

- ◆ Detecting problems at a very early stage could make the release of fixes faster in production.
- ◆ Save the time for the developers to validate their feature changes.
- ◆ Continuous testing automatically runs in the background, executes the test suites, uploads the test result, and sends emails to the respective teams about the validation of the features.
- ◆ With the help of the notification tools such as email and chat, software developers can get the test statistics about the recent code changes, and they can fix the failures.
- ◆ Risks involved decrease as the code quality can be tested in every stage.



Best Practices to Implement Continuous Testing in Application Development

Continuous testing acts as a main component of the DevOps process, and application/software could suffer without the proper implementation of this testing. The best continuous testing practices that developers should consider to build a continuous testing strategy effectively include:

Test Automation as a Fundamental

Automation increases the speed and error coverage at which testing can function. Automating the testing process in the development lifecycle can help developers achieve quick releases.

Tool Integration

Continuous testing involves teams using specific tools to make the testing process easier, faster, more comprehensive, and effective. These tools work with the dev toolchains to remove the manual overhead.

Tracking Metrics

Developers/testers use metrics, like counts of defects, counts of fail/pass test scripts, and the ratio of fails, to check the current code's health. Tracking the number of defects discovered in the testing process will help determine if the number increases or decreases. Verifying the number of pass/fail test scripts will also help developers/testers develop a comprehensive testing strategy to create better functionality for applications. Although some developers/testers may choose various metrics to measure their software's development health, continuous tracking of the data is extremely important during this phase.

Leverage Containerization

Containerization enables continuous testing to process quickly by keeping each service of the application in its own environment. Using containers for test environments keeps the difficult-to-maintain environments up-to-date with the latest code changes that would be released to production.

Keep Communication Transparent

Bottlenecks can form when communication between teams or roles within the organization is not transparent, thus resulting in time wasted that could be spent more productively. Effective communication is the key to achieving the balance necessary for continuous testing.

Save Time with Headless Execution

Headless execution is the part of automating UI tests that don't incorporate the head, i.e., no browser UI or GUI. This process lowers the number of unnecessary caches, cookies, or resources that are sifted through to obtain the results that matter. However, please note that the headless mode is different from the end-user environment. Some types of tests are reliable with headless mode, but not all types of tests.

Multi-layer Tests

A multi-layered approach to running tests ensures that all areas within the development lifecycle are covered. As software methods become more complex, having a multi-layer approach will help testers/developers keep the complexity from overwhelming proper test execution.

Integrate Performance Testing into Delivery Cycle

Performance testing within the delivery cycle is beneficial because it checks the speed, responsiveness, and stability of applications. It is an investigative process that observes how the system is running and finds solutions to overcome those observations.

37%

of developers use the containerization method while performing continuous testing

45%

of developers prefer testing in production

80%

of developers opine that DevOps is at least somewhat important, with almost half of them claiming it is extremely important

50-70%

of tasks performed by companies across all industries are automated

Continuous Testing **With HeadSpin**

The HeadSpin Platform is a data science-driven product that helps product managers, SREs, developers, QA/release engineers, and support professionals collaborate seamlessly to:



Accelerate development cycles with intelligent automation in test and production



Optimize digital performance across applications, devices, and networks



Automatically surface insights with practical, context-aware AI and analytics

As we discussed in the earlier sections of this document, the key components of continuous testing to accelerate the software development process are test automation, continuous integration, and continuous delivery.

The main features of the Platform that are in line with the key components of continuous testing during app/software development are:

- **Integrated Testing:** It offers seamless integration with load testing platforms, like LoadRunner, BlazeMeter, and Jmeter.
- **Automated Testing:** It supports all major testing automation frameworks, like Appium, Selenium, XCTest, Espresso, and more.
- **Continuous Monitoring:** It provides 24/7 access to any device, running any application, on any network, anywhere in the world for continuous quality assurance.

The Platform enables the development team to run continuous testing, providing comprehensive testing capabilities across applications, devices, and networks for mobile, web, IoT, and 5G technologies, including functional, load, and performance testing.

With the above-mentioned features, HeadSpin can help developers reduce costs and time-to-market and focus on delivering customer value.

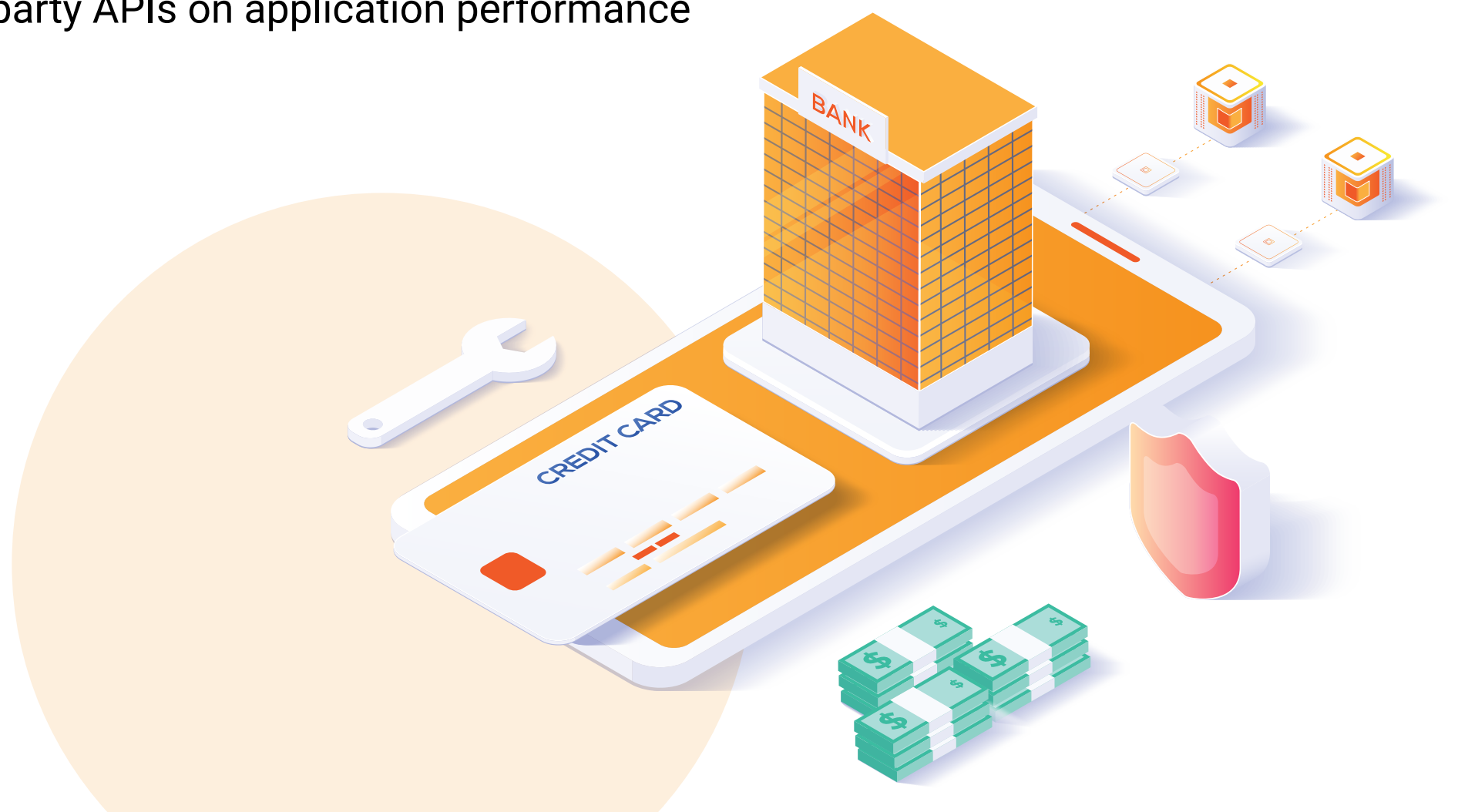
How HeadSpin Helps Companies in BFSI, Media, and Telecom Industries Perform Continuous Testing?

HeadSpin's solutions are used in various industries, mainly in BFSI, telecom, and media. The Platform enables companies in these industries to meet a multitude of testing requirements spanning functional, performance, and regression testing.

Banking, Financial Services, and Insurance (BFSI)

Web and mobile banking apps are becoming the most critical customer channel for financial institutions, and customers today expect their online banking experiences to be just as smooth and easy as—if not more than—their in-person banking experiences. Thus, a website or app with weak security or a lackluster user experience can lead to poor customer satisfaction ratings, lower brand reputation, litigation, and even loss of customers. Thus, continuous testing of these apps/websites is inevitable. The HeadSpin Platform's features that support the companies in the BFSI industry include:

- **CI/CD integration to automate the testing of new builds:** Automatically sniff new builds, run tests, and provide insights on performance regression
- **Automate critical user journeys:** Integrate test automation platforms, such as Appium or Selenium, and automate different customer user journeys
- **Performance regression:** Compare build over build, location over location, network over network, and device over device performance
- **API usage monitoring:** Track how APIs are being used by applications or track the impact of 3rd party APIs on application performance



Media

Testing the audio and video quality of rich media content and voice-activated apps is necessary for delivering a flawless digital experience. However, companies in the media industry struggle to capture test data, assess perceptual video quality, and automate audio/video testing across a wide variety of user devices, including tablets, phones, smart speakers, and set-top boxes. With the use of continuous testing, companies can build/test apps and websites with minimum bugs. HeadSpin's solutions can help companies in the media industry to perform:

- **Functionality testing using** HeadSpin global device infrastructure
- **Continuous monitoring and reporting** to capture all the relevant KPIs
- **AI-powered performance and user experience testing** to automatically identify probable root causes, including backend network and video play quality
- **App-device compatibility testing** to run tests on various apps on different devices like mobile phones, tablets, and other media devices



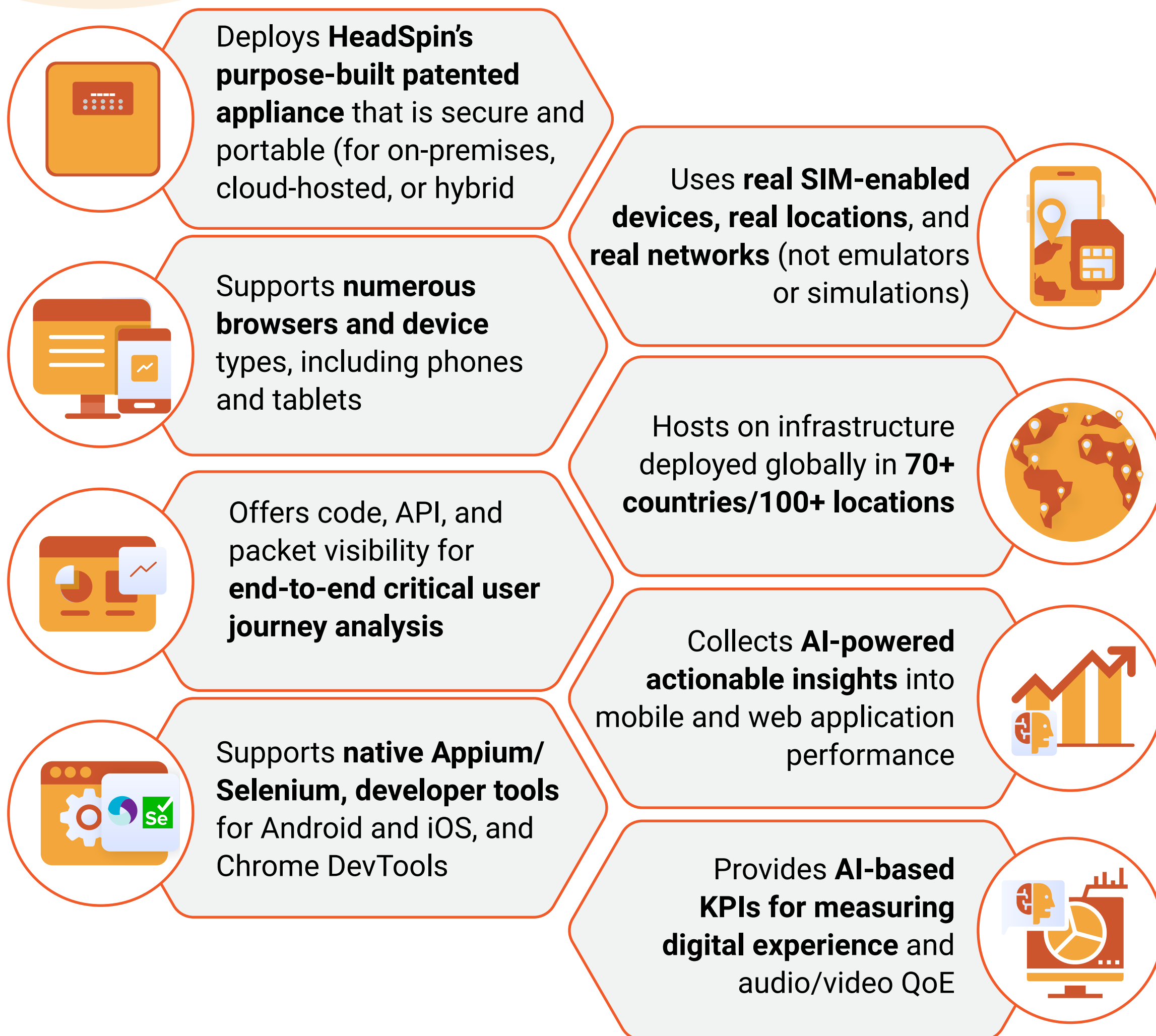
Telecom

In the telecom industry, perfecting customer experience can get very complex due to infrastructure fragmentation and third-party dependency – from varying operating systems and device locations to network traffic and content delivery. Telecom companies rely heavily on continuous testing to fix errors and improve user experience. HeadSpin offers solutions that help telcos to test and deliver industry-standard apps/websites and performance. Some of the features of these solutions include:

- **Continuous QoE/QoS assessment framework** - RF metrics and more
- Ensure **pre-release device compatibility**
- Monitor **client experience for roaming performance** - inbound and outbound
- Test, monitor, and analyze **data, voice, and messaging services**
- Monitor and optimize **5G experiences**



What Makes HeadSpin's Continuous Testing Unique?

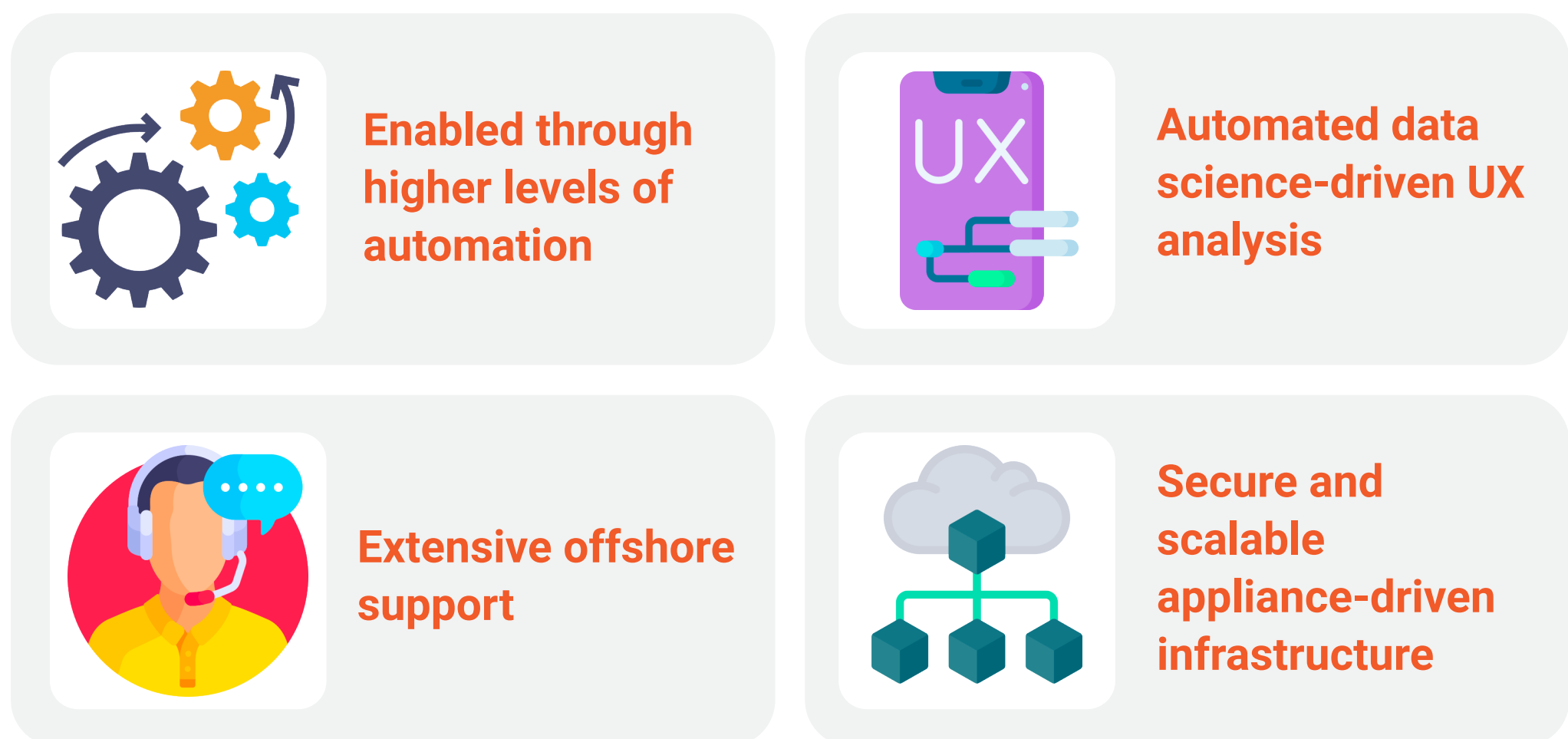


Get Started With **The Right Tool**

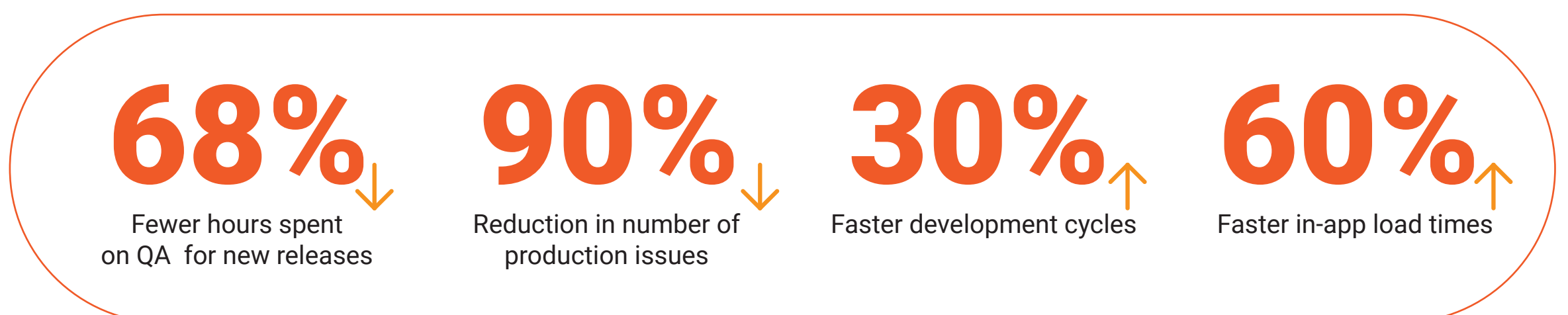
Over the years, companies have invested significantly in optimizing their testing methods to ensure the continuous release of high-quality products. Currently, this has become more important owing to digital transformation.

Always implement continuous testing with the right tools for effective results. To ensure your teams have the best tools for continuous testing, check different solutions offered by HeadSpin.

Benefits of the HeadSpin Platform



What HeadSpin has **Helped Customers Achieve**



To get started, visit: headspin.io

Customer Testimonials

“HeadSpin helped us establish credibility, and that opened up a whole set of new conversations that we didn’t expect out of the gate. Now we’re talking with businesses about other solutions we offer—how performance leads to conversations or impacts business value. We wouldn’t be having those conversations without HeadSpin.”



“Frequent builds always pose a problem. Typically the build teams will solve that by hiring more people. It helps a bit, but it’s not as good as having good tools. HeadSpin gave us the tools to scale in an effective way.”



“HeadSpin gives us better oversight into our ads and allows us to be more proactive in catching errors, versus delivering a bad user experience and maybe not even being aware of it.”



“The performance piece is the part that I’ve never had the ability to do for analysis. We’ve used other tools in the past, but they don’t spit out the documentation or fidelity that HeadSpin does on the performance view.”



About HeadSpin

Founded in 2015 and headquartered in Palo Alto, HeadSpin is the world's first AI Testing & Dev-Ops Collaboration Platform.

The HeadSpin Platform is an industry first, providing a powerful, easy-to-use solution that enables development, QA, product, and operations teams to accelerate release cycles, build for complex real-world user environments, and know whenever any component of the system degrades or breaks—whether at the code, device, or network layer—anywhere in the world.

Since our inception, the Platform's extensive on-prem and cloud-hosted global device infrastructure has been expanded with machine learning-driven performance and quality of experience analytics to proactively test and monitor mobile, web, audio, and video applications in real-time.

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