

The Pulse of Mobile App Development

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THE MOBILE APPLICATION INDUSTRY has exploded in recent years. There are more than five million apps to choose from on the Google Play and Apple App stores today. All that choice has a major implication for the companies that rely on mobile apps to fuel business growth: They must provide an excellent, thoroughly tested mobile experience that keeps users engaged.

The ability to deliver high-quality mobile experiences at the speed users demand can determine a company's ability to compete and thrive in the mobile-first world. But developing mobile applications is complex, requiring teams to iterate fast, incorporate emerging technologies, and build tailored testing strategies that account for an ever-increasing number of variables.

To understand how mobile teams are rising to these challenges, Techstrong Research polled our global communities of DevOps practitioners, cloud-native engineers, testers and developers to understand their perspectives on the role of mobile apps in their businesses, the challenges they face and the emerging technologies they are embracing.

The results paint a clear picture of mobile's rapidly increasing prevalence: Nearly three-fourths of respondents say their businesses are developing mobile apps today or plan to in the next 12 months.

In many cases, mobile apps deliver the same capabilities as their web application counterparts,

Key Findings

- Mobile applications are strategic to organizations, with a majority of organizations (58%) reporting that they are mission-critical or very important to their digital business strategy.
- Mobile app development is well established in organizations (44%), with many more planning to add mobile development in the next 12 months (30%).
- Mobile apps rely heavily on integrations with backend systems (a combined 61%) such as ERP, CRM, location, database and security systems.
- Most organizations develop mobile apps in tandem with web applications (55%), delivering equivalent functionality across platforms.
- Generative AI (50%) and AI/ML (47%) are the leading technologies mobile app developers are actively pursuing for their apps.
- The top challenges in testing mobile apps are cross-device and OS compatibility (26%), a complex array of variables required to navigate and triage problems (22%) and integrations with backend and external systems (19%).
- Mobile tests are most often run on emulators/simulators (32%), and on real device clouds (29%), which enable testing against a larger variety of scenarios, including network conditions and hardware-dependent features.

making mobile apps increasingly business-critical but also more complex. Like web apps, mobile apps are dependent on other software, services and data sources, which can easily number in the hundreds for most applications. Application updates are often synchronized across multiple platforms, devices, OS versions, languages and more. This synchronization introduces complexities for parallel and coordinated development workflows, a large number of complex integrations and the challenges of ensuring that it all works flawlessly across multiple device models and OSes.

Mobile apps are as mainstream as web applications and natively installed software, often creating interdependent DevOps pipelines and the need to synchronize cross-platform releases.

This complex array of variables demands a well-thought-out, comprehensive testing strategy. A combination of manual and automated testing across functional, non-functional and user experience areas are key to delivering and maintaining mobile apps that outshine competitive alternatives. As generative AI and machine learning technologies bring more and more functionality to mobile apps, learning to test AI technologies embedded in apps is paramount. Testing requires collaboration across development, testing and product teams, but pays dividends in app store ratings, brand awareness and user retention.

TECHSTRONG RESEARCH ANALYST VIEW

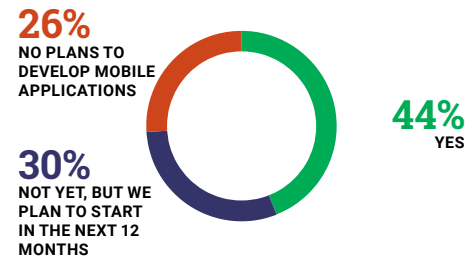
Mobile apps are a critical element of our application ecosystem, unlocking new revenue streams and customer experiences and delivering mission-critical functionality to employees, partners and the broader business ecosystem.

Our research projects a meteoric rise in the number of businesses developing mobile applications over the next 12 months. Many of these apps will deliver functionality that is either equivalent to their web application counterparts or moving in that direction.

We can no longer treat mobile apps as an isolated, standalone development activity. Interdependent releases, testing plans and feature development must be coordinated across mobile,

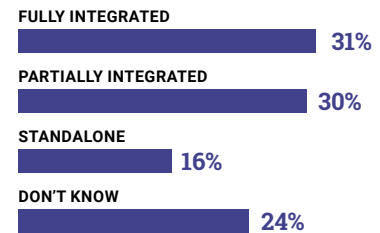
Do you or your team develop mobile applications?

Mobile application development is prevalent (44%) but not yet universal among respondent's organizations today, though a significant 30% plan to begin mobile development within the next year.



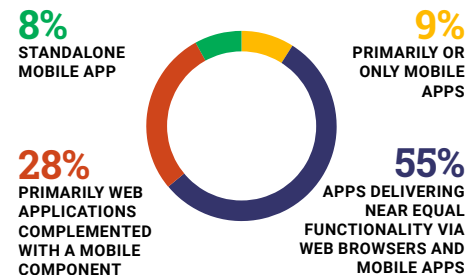
Does your mobile app rely on integrations with core backend systems (ERP, CRM, databases, etc.)?

Mobile applications frequently maintain tight integration with databases, backend enterprise systems like ERP and CRM platforms and third-party services.



What type of applications do you or your team develop most?

Mobile apps are becoming increasingly feature-rich, with a majority delivering functionality that's equivalent or near-equivalent to web applications.



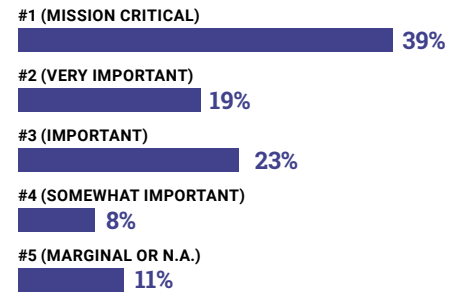
web, enterprise apps and other DevOps pipelines. Testing needs to validate a consistent experience across web and mobile while also dealing with mobile-specific OS and device testing requirements. For the many mobile applications that are dependent on backend systems to deliver the desired customer experience, success will require orchestrating end-to-end workflow testing across these interdependent systems.

Mobile also must encompass the same level of UI, API, security and performance testing as any other developed software traversing our DevOps workflow pipelines. Mobile adds another layer of testing complexity, including variances in device models, hardware features, variances introduced by automatic updates of mobile OS versions, carrier and localization settings and the idiosyncrasies of each operating environment. Due to this complex matrix of variables, many organizations are building dedicated mobile testing teams or turning to low-code/no-code automation technologies to scale automation and shrink testing timelines. Our research shows that preferences for test execution are shifting to device clouds and emulators/simulators, which provide fast access to the needed combinations of devices, mobile OSes and versions of software in widespread use.

AI, and particularly generative AI, will transform mobile apps and devices with new and unrecognizable experiences unfamiliar to today's smartphone users.

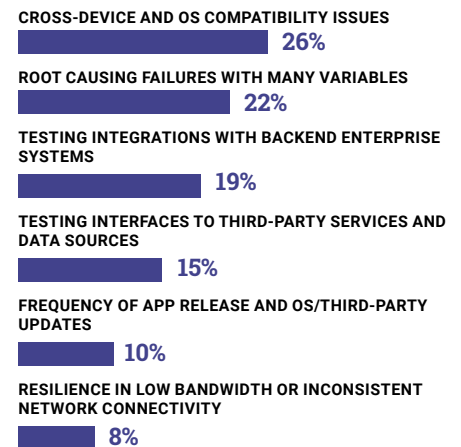
How important is mobile to your organization's digital business strategy?

Mobile is viewed as highly strategic for most organizations' digital business plans, with 58% rating mobile's importance as mission-critical or very important.



What are your top challenges in mobile testing?

Mobile apps present complex and unique testing challenges, from cross-device and OS compatibility to resilience in low or inconsistent bandwidth situations.



Artificial intelligence, and particularly generative AI, is shifting the trajectory of mobile user experience expectations and the smartphone market. Google, Microsoft, Apple, Meta and Qualcomm are all investing in AI to speed up processing and deliver new user experiences. The overwhelming pace of AI innovation will likely make the mobile experience two to three years from now unrecognizable compared to the user experiences of today.

Both designing and testing quality AI-based experiences and leveraging AI across the SDLC are new to most development and quality engineering teams, which presents challenges for software teams and great opportunities for improving mobile experiences, as well as improving the quality of these experiences and the speed at which they are delivered.

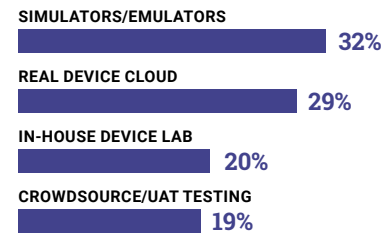
5 KEY SUCCESS FACTORS

Techstrong Research identifies five key mobile development success factors for thriving in a mobile-first world.

1. Integrate mobile development, build and test tools into DevOps toolchains used by interdependent applications where possible.
2. Coordinate releases and features across mobile, web and enterprise software.
3. Use feature flags to predeliver and enable features to synchronize deployment across mobile, web and natively installed apps.
4. Invest in modern mobile testing technologies, including low-code/no-code automation, cloud-connected device grids and/or emulator/simulator grids, generative AI and AI/ML technologies that can assist with identifying the root causes of failures.
5. Address mobile software supply chain security as part of a comprehensive security strategy for CI/CD pipelines, DevOps workflows, dev and test environments and associated technologies.

What do you or your team use to test across multiple mobile devices and operating systems?

Cloud-connected solutions enable testing on a wide variety of devices and configurations not attainable in most organizations' mobile test labs.



Which emerging technologies are you or your team testing in your mobile application?

Respondents showed significant interest in the adoption of new technologies in mobile apps, including AI, IoT and biometrics.

