Integrated Mobility QA: A Strategic Business Enabler for Enhancing End-user Experience Across Digital Channels

As smartphones and tablets enter the market at breakneck speed, organizations need to develop sophisticated testing capabilities and provide cross-platform support in order to deliver proper application quality and business assurance.

Executive Summary

Enterprise mobility is transforming the end-user experience, creating new value for businesses that get it right. Already, forward-thinking companies are leveraging enterprise mobility for competitive differentiation.

The mobile apps landscape has grown exponentially, fueled by the emergence of new platforms, diverse technologies and devices, all requiring seamless integration for widespread adoption. Ensuring impeccable quality and usability of apps is the key for organizations that seek to stay ahead. This is easier said than done, as a fully-formed and functional enterprise mobility quality assurance (QA) strategy continues to elude most IT organizations.

Premium-priced solutions address only the system testing phase of the mobile QA lifecycle; however, they often do not account for strategy definition, nor do they cover mobile nonfunctional testing requirements, which is extremely critical for ensuring a satisfactory user experience. Most often standalone, these solutions do not integrate with standard test management platforms.

Therefore, an integrated, cost-effective, comprehensive mobile QA solution that addresses the end-to-end testing lifecycle will go a long way toward ensuring not only the quality but also the usability of enterprise apps, internally and with customers and partners.

Mobility QA: Driving Business Agility

Mobility is a lever that needs to be aligned with business objectives. Activating that lever is becoming increasingly challenging as the mobile ecosystem expands from mere telephonic devices to smartphones, smart devices, tablets and phablets (devices that include characteristics of both conventional laptops and tablets). To get the most bang for the buck, mobile apps must be compatible and run seamlessly across all of these platforms.

As new platforms are introduced into the enterprise mobility landscape, new support requirements will emerge, with refined features that need to be accounted for. Conventional testing methodologies, which typically begin later in an app’s lifecycle, are rendered inadequate because enterprise requirements for leveraging new
business capabilities pivot around accelerated time to market. As such, three interrelated challenges have emerged:

- **Changing QA mobility priorities.** Mobile QA requires a unique combination of business knowledge, design thinking and service maturity. It transcends functional validation and encompasses interoperability, performance and security issues, shifting the focus from traditional testing to quality engineering. Moreover, as BYOD (bring your own device) becomes commonplace within many organizations, a comprehensive QA strategy that encompasses multiple platforms (including iOS and Android), devices, networks and geographies is paramount. App session times on tablets run twice as long as app sessions on smartphones, but apps are more frequently used on smartphones, according to recent research by Adobe. In order to provide the right end-user experience, organizations must adopt different QA strategies to validate functionalities based on user behavior.

- **Lack of comprehensive lifecycle coverage.** Unlike with desktops, screen dimension and resolution of mobile devices are not standardized, which increases the complexity of rendering mobile test automation. Organizations are also limited by the availability of automated mobile app test tools. Many are point solutions that, in our view, do not offer an end-to-end view of the mobile QA lifecycle. Open source Web tools are cost-effective, but they often do not support native applications, and they fail to execute scripts on a device cloud. Moreover, many of these tools lack support for automation across browsers and platforms.

- **High cost of setting up the mobile QA infrastructure.** Organizations struggle to strike a balance between setup costs for a dedicated and exhaustive mobile testing infrastructure and the limited coverage that minimal devices might otherwise lead to. While on-demand cloud options are available, device clouds more often than not continue to be an expensive proposition for most organizations.

Convergence of QA is inevitable as enterprises struggle to manage multiple development frameworks, mobility priorities and key variables, such as relevant technologies, networks and geographies (see Figure 1).

Organizations struggle to strike a balance between setup costs for a dedicated and exhaustive mobile testing infrastructure and the limited coverage that minimal devices might otherwise lead to.

Parameters for Effective Analysis and Outcome

![Figure 1](image-url)
Smartly Coupled Solutions

Because of the need for a mobile QA ecosystem, it is imperative that solutions address the aforementioned challenges and enable end-to-end integration, while also providing flexibility. The term we use for such solutions is “smartly coupled.”

Getting Started with Smart-Coupling Mobile QA

Organizations need access to deep experience and industry knowledge to gain a quick assessment of their mobile QA capabilities and long-term needs. Leading QA organizations leverage this experience to build assessment engines that benchmark application performance against industry standards and recommend the optimal device suite, automation, infrastructure and tools to manage their testing needs.

Key considerations that organizations use to define their mobile QA strategy include:

- Mobile application development methodologies (Agile, waterfall).
- Mobile application technologies (native, hybrid and Web).
- Multiple mobile platforms (iOS, Android, Windows, BlackBerry).
- Infrastructure combinations (BYOD, in-house, on-demand, emulators).
- Execution/deployment methodologies (B2B or B2C).
- Mobile application complexities.
- User geographies.
- Niche applications (voice-based, Wifi, Bluetooth, etc.)
- Consumer applications (telematics, smartphone banking, etc.)
- Mobility across enterprise apps.

Automation Across Browsers, Platforms and Tools

Automation flexibility is an integral part of the mobile quality ecosystem because it enables com-
prehensive testing across platforms. The wide variety of platforms and browsers in use today necessitates cross-platform validation. However, the ongoing lack of automation tools to support cross-browser/platform testing can incur high costs for organizations that must procure individual tool licenses that only partially meet their QA needs.

**Mobile QA Infrastructure**

A limitation of devices provisioned on the cloud is the small number of provider-recommended automation tools. A platform that can integrate a flexible automation tool suite and device cloud will allow organizations to handle their QA needs with greater agility and reduced cost. When you consider many organizations’ encouragement of BYOD through virtualization techniques, it becomes clear that extensive coverage of testing apps will become a matter of choice.

An ideal mobile QA solution aims to reduce costs by leveraging avenues to test mobile devices on-demand, and easily push devices on and off the device cloud. This not only accelerates QA activities, but it also reduces the maintenance expense of the devices and infrastructure needed to support these vital activities.

**Benefits of an Integrated Solution**

Despite the fact that enterprise mobility QA is seen as a strategic enabler, it is still a work in progress for many companies. For instance, of all companies that test their Web sites, only 23% test their mobile Web site, and only 4% test their mobile apps. An integrated solution that provides comprehensive QA coverage will support organizations wishing to adopt an enterprise strategy for their mobile QA needs and provide users with an enhanced mobile experience.

As such, a high-quality mobile lifecycle management solution will encompass:

- A scalable mobile QA infrastructure.
- Multi-mobile platform testing.
- End-to-end tool set across the testing lifecycle.
- App validation for key nonfunctional parameters.
- Geographic scalability for testing.
- Device provisioning on the cloud, on-demand.

**Looking Forward**

The path to mobile consolidation is evolving. However, organizations that embrace leading QA solutions can gain the flexibility needed to provide an integrated mobile test solution that delivers cross-platform support and flexibility for the future. Organizations should choose an approach that enables continuous enhancements to enterprise mobility as devices, platforms and service providers evolve toward equipping users with a highly functional and consistent experience.

---

**Footnotes**


About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world's leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 50 delivery centers worldwide and approximately 166,400 employees as of September 30, 2013, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at www.cognizant.com or follow us on Twitter: Cognizant.

About the Authors

Ramakrishnan Venkatasubramanian is Cognizant’s Offshore Head of its Global Mobile QA center of excellence. He has 14 years of experience in the information technology industry, spanning software development, product engineering, testing, test automation, mobility and technology consulting. Ram manages multiple complex mobility engagements, focusing on consulting, delivery and business development initiatives. He holds a post-graduate degree in computer technologies and can be reached at Ramakrishnan.Venkatasubramanian@cognizant.com.

Rangarajan Rajamani is a Senior Manager of Product Management within Cognizant’s Quality Engineering & Assurance Technology center of excellence. He has over 11 years of experience, performing roles such as consulting, business development and program management across multiple industry verticals. Ranga holds a post-graduate degree in sciences and management. He can be reached at Rangarajan.Rajamani@cognizant.com.

Vinoth Kumar John Peter is a Senior Manager, New Market Specialist within Cognizant’s Quality Engineering and Assurance Group. He has over 10 years of experience in the financial, healthcare, supply chain and automobile sectors, with experience spanning Six Sigma, data mining and analysis, channel intelligence and IT quality assurance. Vinoth holds a graduate degree in international business from University of South Carolina. He can be reached at Vinothkumar.Johnpeter@cognizant.com.

The authors would like to thank Pradeep Kumar Govindasamy for his contributions to this white paper.