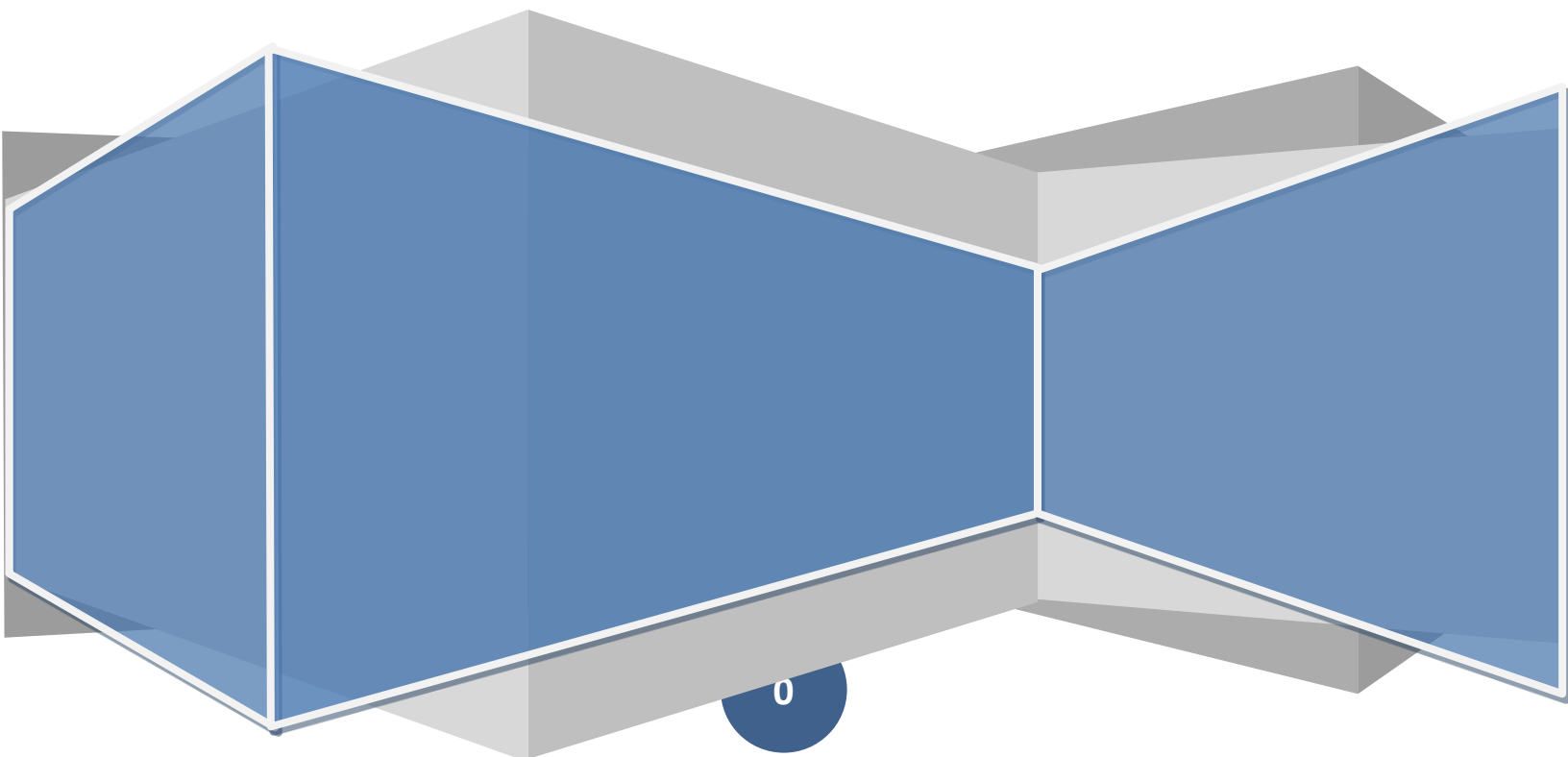


White Paper

Ten Answers Regarding Mobile App Testing

4 November 2013



Abstract

There has been a rapid proliferation of mobile app development by small and large enterprise organizations. It's even to a point now where mobile is being developed first as an innovative way to engage users.

Testing and quality management of mobile apps has evolved rapidly from testing approaches used in the past. In fact, it has created the next big frontier in improving testing efficiency and quality so those important and fit for purpose business apps can come to market quickly with great user experience, even though it may not be bug free.

This paper thoughtfully explores, via a panel of experts answering a set of questions, the factors impacting mobile app testing and quality management.

Those responsible for managing app quality will also have to deal with the Agile methodology common in delivering mobile apps. This accelerates time-to-market objectives and mandates that the app quality process be fully integrated into the overall app development process.

This paper is based on the following webcast:

Mobile Testing: Proven Techniques to Use When Apps Just Have to Work

The panel on that webcast consisted of the following group of experts:

- **Yan (Tina) Zhuo**, Product Manager, IBM Rational
- **Dennis Schultz**, Solution Architect, IBM Rational
- **Yoram Mizrachi**, Founder, Perfecto Mobile
- **John Montgomery**, VP of Project Delivery, uTest

Introduction

Below are the 10 questions regarding mobile testing that are probed in this paper:

1. What are the characteristics of a high quality mobile application?
2. What makes testing of a mobile application unique?
3. Are project teams successfully achieving the FURPS (functionality, usability, reliability, performance, supportability) level of test?
4. Are there any industry-specific examples that demonstrate a different focus on testing?
5. What are some of the testing and quality technologies and best practices employed to help deliver the best apps possible?
6. What are the characteristics of “In the Wild” Testing?
7. Which methodologies change when evolving from the web to mobile?
8. What role does test automation play in proving testing outcomes?
9. Does test automation play a role in helping customers deliver a Mobile First strategy?
10. After test automation, what’s next to enable continuous delivery of high quality mobile apps?

What are the characteristics of a high quality mobile application?

High quality no longer means merely the absence of bugs. What we see is that mobile apps are now measured against a user-centric, more 360 degree view of app quality, which from our perspective includes factoring in usability, performance, content and functional quality, as well as security. If an app fails to meet the expectations of users, it can often be detrimental to the entire brand. There is a huge soapbox for users to voice their displeasure through app reviews and social media. And it is a low switching cost to competitor apps.

We’ve always been faced with balancing user-centric apps with multiple quality factors and completeness. But the focus on the user experience in mobile products forces us to look at those trade-offs somewhat differently than we may have for traditional web or desktop type applications. The user’s experience is really king in mobile and it often drives our perception of what high quality means

What makes testing of a mobile application unique?

The complexity of test has increased making the test matrix exponentially larger than it was before, specifically in mobile. For example, right now on the market, there are some 12,000 unique Android devices alone . The fragmented mobile market has created huge challenges for app developers.

At the same time, the cost of development for mobile apps is less than what we traditionally saw for other types of applications, which means the engineering and testing budget are reduced, too.

The development methods employed to build these mobile apps often don't follow the same traditional methods that we've been used to. That's because the pace of mobile development is much more intense. Deliveries often don't follow a regular periodic cadence, but require a much more agile approach, especially when it comes to testing and quality.

The question can quickly become: who should test the apps? Is it the responsibility of development, a center of excellence or some combination of the two? Where does the hand-off occur?

Are clients successfully achieving the FURPS (functionality, usability, reliability, performance, supportability) level of test?

You cannot test it all because the number of different vectors that you need to cover with mobile are much greater than in traditional testing if you want to keep up with the market.

Plus, if anything, we are seeing mobile applications which have more features or more functionality than the web equivalent. We need to test at least the same as that web equivalent and usually more. For example, an airline application requires check-in abilities on the web. But on the mobile application, you also need to have ticket presentation ability, baggage tracking and many more functions to test.

That's why people who just use traditional techniques to determine the test requirements struggle to be successful. They need to understand these trade-offs in relation to the time-to-market goals and the quality tolerances of the consumer-base. The successful companies will look at mobile as something different and rethink their approaches completely, taking a mobile first perspective. This begins by looking at the target market, the intention of the app and the risk profile. There is also constant explicit and implicit quality feedback from developers, testers and end users to be incorporated

By looking at all these things, you can adjust accordingly for FURPS and beyond, even into things like security, privacy and content, because those also play a very big role in perception of quality.

Are there any industry-specific examples that demonstrate a different focus on testing?

Companies like Twitter, Facebook and Google are trying to get new features out in the market. One of their marketing techniques is to provide free applications to consumers. They may sacrifice inconsequential bugs to be able to launch a new feature. If a bug is not going to impact 100,000 people, they may or may not fix it.

However, big brand companies or firms where trust is really important, like banking, really cannot have any functional bugs that make consumers think they can't be trusted. If there are security or even minor functionality flaws, it could lead to poor perceptions and damage that trust.

Remember though, that the drive in the banking industry is for mobile applications. This is supported by an Alexis Partners study that suggested nearly half of smart phone users that switched banks said that mobile banking was an important factor in their decision. That's up from only 7% in 2010.

Financial clients feel they have to add new features and capabilities to differentiate themselves from other providers, but at the same time, they have to maintain an extremely high level of quality and security in their applications.

What are some of the testing and quality technologies and best practices employed to help deliver the best apps possible?



You need to begin testing early. This can be a real challenge on a mobile app, because the app may depend on multi-tiered distributed systems, mainframes, ERP systems and packaged application systems. All of these are typically developed and maintained by separate teams who are operating on different schedules and different budgets. Integrating them could be a huge challenge, and yet it is very much needed for most enterprise mobile apps that are strategic to the business and in high demand .

Some of our customers are using service virtualization. This is a practice of developing stubs for those back-end systems with solutions like IBM Rational Test Workbench and Rational Test Virtualization Server. It enables our customers to move the mobile development forward, while at the same time avoiding the situation where integration testing has to be delayed until the end when all of those other dependent services are live and ready. Virtualization also gives you the opportunity to perform complete testing for unexpected conditions.

This has all caused service virtualization and then UI test automation to become very big. A system like Rational Test Workbench automates the exercise of the UI from the front of the application to verify the performance and the functionality of the application. IBM Rational Test Workbench is being used for integration testing, virtualization of back-end services

and UI test automation.

What are the characteristics of “In the Wild” Testing?

“In the Wild” testing means getting professional testers who exist in your target market. This type of testing can allow you to reach into any target market, anywhere. The testing is done on real devices to try applications as they are intended (and even not intended) to be used by a company. These testers can take advantage of localized services, represent your user base by reaching target markets and complement the testing done inside their labs.

“In the Wild” testing can be integrated into application lifecycle management processes and aligned with their in-house bug tracking systems.

Which methodologies change when evolving from the web to mobile?

One traditional methodology that has to be re-examined is what we usually think of as requirements gathering and requirements management. Mobile is much different. We need to be able to react very quickly to user’s demands even while those demands often change rather quickly.

That means the requirements gathering process has to definitely involve the users, even more so than ever before. We need to understand what our user base or our prospective user base wants if we’re going to try and entice them away from our competitors.

One of the things that we’ve been seeing is an increased number of companies taking a *mobile first* approach to developing their products. We can develop for a mobile platform and then move it to web. That’s one of the approaches that we’ve been noticing.

In fact, we’re at a tipping point with mobile first. Enterprise customers are realizing that the mobile app will be the primary way that customers interface with their organizations. It’s no longer just a sideline or a nice to have. It may even be driving the business and serve as the face of the company.

This is happening so frequently that IBM MobileFirst is the name that we’ve adopted at IBM for a very large initiative to support our comprehensive mobile strategy.

What role does test automation play in proving testing outcomes?

Automation is or will become essential to most of our clients. If there are testing teams that are able to keep up with manual testing, eventually, they’re going to be overwhelmed. As organizations ramp up and see the central role that mobile will play in the future, the pace

of the development and release is only going to accelerate making automating testing mandatory.

It's a key to any testing strategy. But the questions are:

- How do you create efficient testing automation which can run on multiple devices?
- How do you create efficient automation which uses a minimal amount of changes between your versions?
- How do you create automation which can be truly unattended?

The answers to these questions are very important when it comes to mobile. Practically speaking, they determine the level of efficiency that can be derived from your testing efforts and the coverage reach you hope to achieve.

Does test automation play a role in helping customers deliver a mobile first strategy?

In the past, testing has been: let's just see what we can put together manually and that should work. But with a mobile first perspective, this is definitely going to become part of the defining strategy. Any mobile team is working with agile methodologies. One of the big Agile tenets is test-driven design. We're going to see more firms automate test up front so that they can build a quality product from the beginning.

With agile teams doing mobile development, the lines between tester and developer are becoming blurred. The quality is not simply the responsibility of a tester at the end; it's really the responsibility of the entire team.

After test automation, what's next for continuous delivery of high quality mobile apps?

Mobile app testing and quality management will remain a challenge for organization who needs to continuously deliver high quality mobile apps. Three factors on the horizon that are likely to impact mobile testing in the future include:

- Incorporating test automation into the DevOps lifecycle as part of the release and delivery pipeline.
- Reducing fragmentation through improved standardization around security, development, etc. similar to what was experienced testing software for the web
- Transforming what is being done for mobile in order to move it into up and coming mobile environments like cars, TVs and even refrigerators

Mobile app testing and quality assurance are unexplored frontiers in the IT development business and will remain a constant challenge as organizations strive to deliver the highest

quality mobile apps possible, ones which engage and delight their users while optimizing access to back-end systems and providing the security users expect.

To support organizations in their adoption of a mobile first strategy, IBM has [announced](#) an [open beta](#) of [IBM Mobile Quality Assurance](#). It acknowledges that end user feedback and quality metrics are needed at every stage of development to improve user experience and app quality. Engaging testers across the globe, IBM Mobile Quality Assurance (IBM MQA) provides line of business professionals and development teams with insightful and streamlined quality feedback and metrics, enabling them to prioritize and take action to support a dynamic mobile app strategy.