

How To Build (& Support) Your 5-Star Mobile App

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Introduction: Why a 5-Star Mobile App Is a Great Tool for Your Business and Brand

Mobile devices have transformed the way we interact with technology, and consumers, rather than IT organizations, are driving the push. In just under a decade, mobile has become the primary means of interacting with businesses and the products and services they provide. A 2013 IDC survey reports that 80% of Americans ages 18-44 checks their smartphones within 15 minutes of waking up, a number expected to rise in all demographics.

Since 2008, when Apple introduced the first mobile “App Store,” millions of mobile apps already have been developed to perform a seemingly infinite number of different tasks, from booking local and international travel to managing tens of thousands of evidence files for a class-action lawsuit. And new apps are released daily to handle just about anything else imaginable for devices lighter and smaller than a standard hard disk drive.

A great mobile app can do wonders for your organization. It can increase your customer base, engage current customers into forming closer bonds with your business, and generate more awareness and traction for your brand. However, an app that fails to solve customer pain points or fails to deliver great performance will at best languish with the millions of other apps that are rarely downloaded and at worst give your organization a black eye.

Few apps in any category boast 5-star ratings, typically for these reasons:

- They fail to understand, let alone solve, customer pain points
- They fail to offer an enhanced user experience that leads to consistent, repeated use
- Their user interfaces are hard to navigate
- Their performance is slow
- They freeze or crash
- The developers' customer support is poor or nonexistent
- The developers rarely update the app
- Updates fail to incorporate customer requests

How do you avoid such pitfalls and create an app worthy of the 5-star rating? You need to create and develop a strategy that leads to a deeper understanding of your audience and the technology necessary to assure that any app you release to the public performs to expectations. We hope this AppDynamics ebook will supply you with a blueprint in which to develop this strategy and show you the ways a mobile APM solution plays a central role in ensuring its ongoing success.

Chapter 1

The Qualities of a 5-Star Mobile App

Chapter 1: The Qualities of a 5-Star Mobile App

What qualities comprise a 5-star mobile app? Its users will give you the best answer.

For example, an app released by a well-known pizza chain has *thousands* of 5-star reviews. The app has achieved this nearly 5-star overall rating, despite increasing competition with other pizza franchises and food delivery services, because it solves a host of problems for its customers.

Take a common persona for this type of app: a harried working mom who needs to feed her family. She doesn't have time to cook dinner. She doesn't have the time to go out in rush hour traffic to pick up food. She doesn't want the frustration of someone misunderstanding her address and delivering her order to the wrong end of town. And she sure doesn't want to open the box and find sausage instead of pepperoni on her pizza.

This pizza chain's app removes several of the hassles this mom usually endures and then halves the number of potential steps needed to place an order. It keeps her correct address on file. She gets to choose what goes on the pizza by visually adding toppings to a virtual pizza. It reminds her to order drinks and sides. It tells her the estimated delivery time and from what franchise the pizza is coming from. It allows her to pay for her order online. And it provides confirmation of her order, making the process almost dummy-proof.

This level of usability and reliability has made the app a hit with the chain's customers. And those 5-star ratings and positive reviews no doubt gratify the pizza chain's leadership.

However, a true 5-star mobile app needs to meet the company's goals as well, which this app succeeds in doing. There are obvious cost savings, such as fewer employees needed at given franchise locations. More importantly though, this app helps the chain increase profits at a time where it faces competition from other pizza chains and delivery services. Because it makes ordering pizza so easy and fun, its customers may default to using it even if pizza isn't the first choice for tonight's menu because they enjoy engaging with the app. As a result, the app has enriched the overall perception of the brand.

In today's software-powered world, customer satisfaction is directly linked to a company's success, and a mobile app can become an emblem of your company's ethos. A pizza chain that used to coast on its reputation for speedy delivery (and little else) has built a reputation as a company that not only appears to understand its customers' problems, it cares so much about remediating them that it offers a deceptively simple app to solve most of them in a delightful fashion (imagine how many kids stopped whining the moment they got the opportunity to drag virtual pepperoni onto a virtual pie). In other words, it *values* its customers, and its customers respond by leaving 5-star reviews and recommending it to their friends.

No marketing campaign can give you this level of traction, be it positive or negative. In order to create a 5-star mobile app, one that benefits your reputation and your bottom line, you must take into account three key considerations:

- Your business goals in building this app
- Customer needs and pain points your app could potentially address
- Ensuring the speedy and reliable delivery of your app—and improving its performance whenever possible.

We will discuss all three considerations in more detail in the following chapters.

Chapter 2

The Business Objectives for Your Mobile App

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Some of you may be asking, *Do I even need a mobile app?* Perhaps your business builds enterprise supply chain applications, or your mobile-friendly e-commerce website makes a separate app seem redundant.

The primary reason to design and develop any mobile app is to serve your customers, which we will discuss in more detail *in the next chapter*. But as far as how it may directly benefit you, consider that mobile apps often act as the first intimate contact point for most of your customers and as an ambassador of your brand.

For example, a customer accesses your enterprise application through a workstation to handle the bulk of his work. But there are times where he wishes he could monitor certain processes while he's on the go. A lightweight mobile app that accesses basic tasks and alerts him only when something is amiss means he no longer has to go to his office on the weekend. He can go to his son's Little League game. He can host a barbecue. He gets a huge chunk of his life back.

Similarly, a tablet-based mobile app offers the customer of an e-commerce site a more immersive, enjoyable experience than its web app. Instead of having to input a URL into his web browser, the customer taps the app icon and goes immediately to the online store. The app already has him signed in. It remembers what is in his shopping cart and knows his buying and shipping preferences. It automatically sends an alert when the product has been shipped. If he needs to contact customer service, the option is available in the main menu. It's so pleasant to use that even at home he prefers it to accessing the website on his computer.

The fact is most users engage with your business on multiple channels; therefore, when you make more touch points available, they will have more confidence in your apps and your brand as a whole. Given the attachment people have with their smartphones and mobile devices, the ability to associate that intimacy with your brand on their devices solidifies their customer experience in a way that satisfies them, prompts them to return to your app, recommend you to their friends, and post those 5-star ratings that encourage other customers to download it and have similarly positive experiences.

This approach can pay for itself many times over, as long as you provide consistent user experiences across all these channels. If you fail to provide an intuitive UI that meets your customers' needs or if the performance on one or more of the apps is slow or unreliable (discussed further in Chapter 4), this approach may backfire.

Your objectives for your app will no doubt shift as you gain a better understanding of your customers' needs. In the meantime, here are some questions to ask yourself during the design stage:

- How do you expect your customers to interact with your proposed mobile app?
- If you're using this app primarily as a means to engage with your customers, what features could you offer that would strengthen customer loyalty and extend your brand's reputation?
- Do you plan to build and improve on this app over the long term and over many iteration cycles?
- Do you plan to directly monetize this app? If so, will you release it as a paid app, a free app with premium options that can be purchased inside the app, or an ad-supported app?
- Do you plan to build a native app, an HTML5-based app, or a hybrid app?
- What resources do you have at your disposal to design and build the app?

No doubt you'll come up with more questions as you go through the design process. In the next chapter, we'll discuss the most important ingredient to building your mobile app: the needs and pain points of your customers.

Chapter 3

Identifying Mobile Opportunities by Anticipating Your Customers' Needs

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It's easy to delineate why a mobile app like the pizza app discussed in Chapter 1 succeeds in being a 5-star app (Hindsight is 20/20, as the old saying goes). But how do you identify mobile opportunities your proposed app could solve?

Your first task should be to focus on your customer. Specifically you need to consider and map out the "Customer Lifecycle," which addresses your customer journey and the pain points he or she currently face. Questions to ask yourself while diagramming this journey include:

- What stages does your customer go through when engaging with your organization?
- How long does each stage take?
- What areas could a mobile app be used to cut out steps, reduce areas of friction, or otherwise enhance their journey?

These questions are important because in many cases your customer can't articulate what improvements in the journey he or she may want. A customer has used an ATM to deposit her paychecks throughout her working life. She may find it a hassle to have to drive to her local branch and wait in line every other Friday with all the other bank customers depositing their paychecks, but it's just how things have always been done—and it's certainly an improvement from the days when her father had to wait in line for a bank teller to deposit *his* check.

As a mobile app developer, it's your job to anticipate what areas could be truncated or eliminated entirely from the task at hand. When we discuss terms like "enhanced customer experience" and "delighting the customer," this is what we mean. When a customer finds a mobile banking app that removes several of these steps—steps she never thought could be removed (or thought about at all because that's just *how things are*)—how could she not be delighted? This seemingly simple app has improved her quality of life.

Because mobile apps are used differently from traditional web or desktop apps, your diagram of your customer journey should take into account issues specific to mobile apps that impact the way your proposed app would work, such as:

- How the customer uses mobile apps
- How the customer discovers apps
- The context in which the customer would use a mobile app
- Why the customer comes back to using certain apps and not others
- How you respond to customer feature requests
- How a mobile app's performance affects customer usage

Let's explore each of these points in more detail by analyzing a mobile banking app, one that would enable the aforementioned bank customer to deposit checks without having to visit her bank.

How Mobile Apps Are Used

As we've discussed, people expect different things out of mobile apps from client and browser-based ones. Generally they use computers for extended periods of time, usually with multiple applications open at any given time. When their bank's website is slow to load, they won't automatically close the browser page despite their frustration because they can work on other tasks using other applications while waiting for the page to load. They may grumble about the website's performance, but switching banks takes a lot more effort than changing pizza delivery services.

In contrast, people use mobile apps for short periods of time, typically under two minutes. Because user relationships with mobile devices tend to be so personal, they expect these apps to work at close to brain speed (i.e. instantaneously). When a mobile app fails to perform at this level of responsiveness, the user deletes the app either in favor of a better one, or in the case of the banking app, of depositing checks the old way at the ATM. Even if your app halves the number of steps needed to deposit that check, the customer will not adopt it if the performance is lacking. And it may be a long time before she tries that type of app again—very likely with your competitor's app after she switches her accounts to that bank.

How Mobile Apps Are Discovered

In general, however, users go to the app store their devices uses to find a solution to a specific problem or to discover something new and cool. Variables like old-fashioned word of mouth, positive tweets, and other social media-related commentary also coax them to try out specific apps. Customer reviews touting an app's usability and application performance, along with 4-star and 5-star ratings, persuade the user to download an app.

Of course, the average banking customer will just download her bank's official mobile app, but in this case the bank's app is competing against older, reliable processes (the ATM) rather than competing mobile apps. And there's always a risk of losing a customer if your competition delivers a mobile app that transforms the banking experience—and its customers rave about it.

Chapter 3: Identifying Mobile Opportunities by Anticipating Your Customers' Needs (cont'd)

The Context in Which Mobile Apps Are Used

For a customer to replace her current bank depositing process with a mobile app, that app needs to address specific aspects of that customer's process and then improve on them. To improve on them, you, as the developer, need to have a genuine appreciation of the context in which this app will be used.

When you diagram your customer's journey, you probably gleaned several things, including the length of time it takes to deposit a check and the concerns your customer has when doing so.

We've already covered the additional steps the customer currently takes to deposit a check at an ATM, so let's consider another aspect: security. An ATM seems fairly secure. You input a unique PIN code known only to you, and you get a printed or emailed receipt documenting the deposit.

Of course, PIN codes get stolen in a number of ways, from the simple peering over a user's shoulder as the code is inputted to hacks into the ATM's operating system. Moreover, a customer also faces basic safety concerns when going to an ATM, particularly at times when there isn't a security presence. If our representative bank customer gets out of work too late on a winter day, for example, she probably won't deposit that check on her drive home, adding one more errand to her to-do list that weekend.

When you understand this customer context, you then have the knowledge to build features within the banking app that anticipate and then solve her security concerns. For example, your developers can leverage a technology like Apple's Touch ID feature, so that the customer can authenticate her identity with just a thumbprint, rather than a PIN code that can be stolen or a complex password that is hard to remember, let alone input, on a mobile device. A feature like thumbprint authentication is a dramatic improvement over PIN codes and passwords. This easy and safe authentication process allows her to deposit her check at home or anyplace else she deems safe, also a dramatic improvement over having to go to an ATM.

How Relevant Features Motivate Customers To Repeatedly Use a Mobile App

The best way to get your customers to repeatedly use your app is to provide an experience that improves a given task, usually in a comprehensive way. The authentication capability in our banking app may be adequate to getting several customers to use it as a replacement for the ATM. However, our customer is not using the app on a regular basis. While she loves the overall concept and the Touch ID authentication feature, she finds scanning her checks a bothersome process. The current version of the app expects the user to scan a check by taking photos of the front and back sides, but she finds it difficult to get the check in focus to snap the photo—and the app frequently rejects the scan and forces her to retake it.

Her frustration with an app of this potential prompts her to write a review where she complains about this faulty functionality. She even writes that she would add another star or two to her current 3-star rating if the bank could solve this problem.

Assuming you're a conscientious developer, you take her criticism seriously. You can tell from other reviews (and your analytics, which we'll discuss more fully in Chapter 5) that many of your customers are only using the app sporadically at best. Armed with this knowledge, you start looking at document scanning apps with high user ratings and learn that a favorite feature is "automatic" scanning, where the app's sensors "see" and scan a document without the user having to do more than aim at the document. If the document is showing up too blurry or too far away in the viewfinder, the screen instructs the user to move closer or to hold still. You incorporate a similar feature in the check-scanning portion of the banking app, and that becomes the tipping point where this customer finally replaces the ATM with your app.

Chapter 3: Identifying Mobile Opportunities by Anticipating Your Customers' Needs (cont'd)

How You Respond to Customer Feature Requests

The ways you respond to customer complaints and feature requests can further separate you from the pack of mediocre apps. Responding to these problems can be a blessing in disguise because your customers feel not only that you've heard them, you appreciate them enough to ameliorate those issues. As a result, these customers become more engaged with your mobile app and your brand because they feel a deeper connection than they would have otherwise.

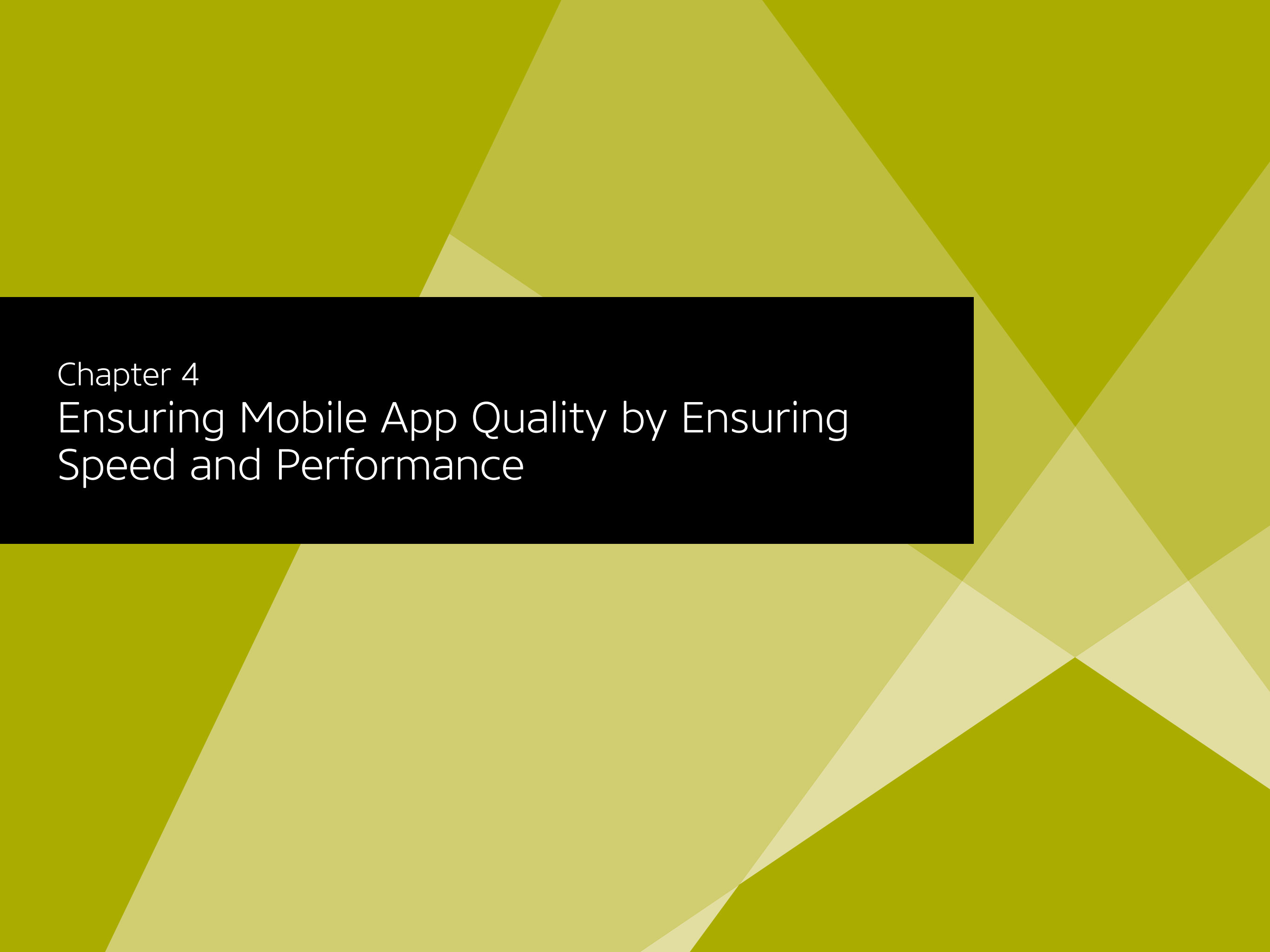
You can leverage this connection further establishing a "co-creation" policy. Rather than getting customer feedback after an app has launched, you invite your most valued customers to help you develop your mobile app, from the early concept and design stages all the way to the development and release stages. When they tell you their pain points, you're able to flesh out the diagram of your customer journey and ideally come up with additional features that you may have missed otherwise.

Then once your app is released, continue to use customer comments, suggestions, and reviews as guidelines for app improvements. This continuous focus on your customers' well being will pay off in the long term as more customers recommend your app to new customers, who are impressed with the way you do business.

How a Mobile App's Performance Impacts Customer Usage

Of course, all of these points become moot if you fail to offer outstanding performance. As we discussed in the first point about how apps are used, even the most sophisticated, feature-rich app will be deleted and then ridiculed if it lags, crashes, or is otherwise unreliable.

We will explore this issue in depth in the next chapter.



Chapter 4
Ensuring Mobile App Quality by Ensuring
Speed and Performance

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A weather app doesn't immediately display the local forecast. A camera app doesn't instantly reveal the viewfinder. A PDF reader app crashes when loading a file from a Dropbox folder. According to a 2014 study by Institute of Management Studies (IMS) at Goldsmiths, University of London, 86% of users will delete a mobile app after just one poor experience. Users simply won't put up with lousy performance—and in most cases, they don't have to.

The pressure to perform is greater than ever. Yet mobile apps dramatically increase the complexities and load on your IT environment. The average mobile app interfaces with between six and 10 APIs or cloud services. These APIs vary from internal services like your CRM to third-party services like Facebook, Gmail, and PayPal.

In addition to APIs and cloud services, a typical mobile app interacts with a plethora of technologies, including:

- Networks, including Wi-Fi, 3G, 4G, and LTE
- Multiple operating systems like Android, iOS, and Windows Phone
- Different versions within a single operating system like iOS 7 vs. iOS 8 or Lollipop vs. KitKat for Android
- Data storage back-end infrastructures
- Mainframe circumstances
- Surges in user traffic

Customer-based complexities further complicate the situation. Some of your customers may find that an earlier version of your app works well for their needs. Others may hop from the mobile version of your app to your web app and back again, expecting consistent (and fast) performance from both.

To maintain speedy, reliable mobile app performance, you need an end-to-end Application Performance Management (APM) platform that can monitor your mobile apps through every process and integration. The APM solution you choose can make the difference between a 5-star app and a 1-star one.

At minimum you need a mobile APM solution that gives you the tools to *See, Act, and Know*:

See: The ability to visualize and monitor all transactions of your mobile app throughout the customer journey with the mobile app. It should also provide a unified console that describes these processes and their impact in a way that everyone involved, specifically app developers, IT operations staff, and people on the business and marketing side of your project, can understand and helps all these groups to collaborate to find issues and solve problems.

Act: The ability to let you respond quickly to any performance glitch and fix it before it impacts your customers. MTTR (Mean Time To Resolution) functionality, including rapid root cause analysis, is an indispensable element of this principle.

Know: The ability to measure and study transactions using embedded analytics (to be discussed in Chapter 5) so that you can improve and optimize your mobile app's performance and understand the links between performance and business outcomes.

Furthermore, an effective mobile app APM solution should supply the following seven features to bring your mobile app to a 5-star level:

1. *Rapidly grasp customer impact*

Your mobile APM solution should anticipate areas where your mobile app's performance could impact your customers. It should have end-user experience monitoring features like Real User Monitoring (RUM) and synthetic monitoring.

Chapter 4: Ensuring Mobile App Quality by Ensuring Speed and Performance (cont'd)

2. Identify the customers you need to contact

Your mobile APM solution should provide the insight into customer behavior to identify the number, types, and importance of the customers who may be affected by a performance problem. This customer visibility, accessible via easy data query, customized dashboards, and reporting capabilities, fortifies your customer first approach and enables you to easily contact customers impacted by performance issues.

3. Lets you monitor all application transactions—and translate them into business ones.

Your mobile APM solution should monitor all app transactions as they run from your customer all the way to back-end databases or data store servers. In addition, it should render these transactions into business transactions so that the non-technical members of your organization also can see the potential business impact of any performance problem. That way everyone across your organization can collaborate on fixes.

4. End-to-end root cause monitoring to facilitate fast MTTR

Your mobile APM solution should dramatically cut the time needed to identify the root cause of performance problems by hunting for it across all tiers in your IT environment, including:

- The affected application
- The underlying code
- Integrations between the application and other apps or services
- Lack of capacity or bandwidth
- Database problem
- Network problem
- Infrastructure workload
- Third-party issue

5. One console to facilitate business-wide collaboration especially during customer impacting issues

Your mobile APM solution should centralize all information on a single console. This single console must be able to show the performance of web and mobile applications, so that relevant teams may collaborate on performance issues in real-time.

6. Automation functionality for quick adoption and fast remediation

Your mobile APM solution should include embedded automation functionality to automate processes and facilitate faster response times.

These automation capabilities should include such actions as:

- Dynamic monitoring of everything in your infrastructure
- Dynamic thresholds that generate appropriate alerts whenever a process fails to meet them
- Integration with application and infrastructure automation to enable process automation
- Run Book Automation (RBA) capabilities that trigger scripts to prevent capacity or memory issues for impairing app performance
- Analysis of past performance situations to optimize an app's performance

7. Easy to use

Your mobile APM solution should be simple enough for anyone in your organization to use. At minimum it should be easy to deploy, configure, operate, and query while supporting on-premise, SaaS, and hybrid application deployments. It should also offer multiple deployment methods that take into account such variables as:

- Regulations and data privacy rules by industry, nation, or political-economic unions like the EU
- Differences in code
- Multiple versions of apps
- Multiple IT infrastructures.

The AppDynamics platform offers all of these features to support your mobile apps. In addition, it also collects and analyzes metrics to further optimize your mobile app performance. We will discuss this further in the next chapter.



Chapter 5
Using Analytics To Optimize Mobile
App Delivery

Chapter 5: Using Analytics To Optimize Mobile App Delivery

As we discussed in the last chapter, your mobile APM solution should assure the quality of the mobile apps you deliver to your customers. At minimum it should change your monitoring strategy so that you can proactively solve performance problems, rather than reactively chasing bugs and other issues after they have impacted your customers.

Once you have reached this level of performance management, you then want to optimize your app's future functionality and performance. Analytics transcends performance management by giving you the measurements to determine weak points in your app's journey, stop issues from happening in the first place, and improving business outcomes.

A good mobile APM should provide analytics capabilities to measure and organize metrics in three main buckets:

- Technical, such as crash rates, latency issues, and amount of time an app takes to engage back-end services
- Engagement, such as MAU (Monthly Active Users) and DAU (Daily Active Users), average user session time, and user demographics
- Business, such as revenue per transaction, abandonment rate, and app store data

Analytics help you make the connection between app performance and user engagement to holistically understand how your mobile app is improving your business overall. And analytics should be information that everyone across your organization can understand and act on.

When you take a common technical metric like MTTR, your goal over time is, of course, to lower it as much as possible. But the reasons behind doing so go beyond operational efficiencies and lower costs. With analytics you can show your marketing department how each minute it takes to resolve a performance issue correlates to lowered customer engagement and lower app store ratings. Having such information on hand enables people from across all of your divisions to have a stake in fixing the problem. No longer is it an IT problem but a business problem, with everyone seeking the same resolution.

And analytics, when you get beyond the basic pre-canned views most solutions providers offer today, can unlock all sorts of data potential when you have the capability of slicing and dicing it in different ways. For example, if your company plans to host an event in the Los Angeles metropolitan area. Analytics capabilities, such as those offered by AppDynamics, lets you drill down to see specifics of user engagement with your mobile app in that region. You can find out if the majority of your Los Angeles-area users use the Android or iOS version of your app, the age and gender demographics of those customers, and even the most common use scenarios of your app. This information helps you to target your customer beyond the mobile app itself and cater to their needs in a way that deepen their engagement to your company as a whole.

Conclusion: Building a 5-Star Mobile App Reflects Your Overall Business Strategy

As we said in our introduction, the strategy you develop to design and build a 5-star mobile app brings about a deeper understanding of your customers and helps you develop products and services that meet their needs and ultimately improves your customer traction and reinforces the quality of your brand to the public.

But mobile apps and their related strategies do not exist in a vacuum. Your mobile app should be seen as a symbol for your brand as a whole. The steps discussed in this ebook are applicable to everything else you do in your business.

Performance management tools like AppDynamics enable you to improve quality of your app delivery so that rather than reactively chasing bugs and fighting fires, you can focus instead on what people are saying about the application. This information becomes your roadmap for future functionality—and for creating and maintaining 5-star mobile apps going forward.

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