Development and deployment of mobile apps on as many platforms and devices as feasible.

Name: Ankit Lalotra

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Professor: Dr. Haim Levkowitz

**Abstract**

To build an application, you need a step-by-step process that can help you build mobile apps quickly. There are three important steps: Understand the requirement, Develop the Product and Test the product.

**Introduction / Understanding the requirements**

The first step in the mobile app development process is to create a strategy by defining why? What is the objective of your app? How will your mobile app solve an industry problem? What is your business model? How much are you ready to invest in building this app? What is your revenue model? How will you market your app, and to who? Answering these questions will give you a fair idea of how you can move forward with your mobile app development process.

You can start by defining the user persona. For example, suppose you are planning to build an eCommerce app. In that case, you will define your user persona by understanding your user’s age, their mobile usage habits, their preference, and specifically answering why and how they will find your mobile app users. Based on that, you can create an MVP (Minimum Viable Product).

Building a mobile app starts with an app idea. However, you require an extensive amount of brainstorming to develop an ultimate list of features you can offer your customers. You can start with the essential elements and note down other lesser crucial features as they are revealed to you. Who knows, you might surprise yourself with ideas you never knew you could implement. Sit together with your team and ask them for all the ideas they can come up with. This will help you and you team to use your time wisely and finish the app in a timely manner.

Once you are clear about all the functionalities you can include the functionalities your users would like to use from the start, you define what your minimum viable product would look like. A minimum viable product is the version of your app that has enough features to put it in front of your early customers so that you can receive feedback on product features and further development.

For a MVP example:

* Test the product market using minimum resources
* Get investors to see the vision behind your app (if need budgeting)
* Quickly learn what works and what doesn’t
* Waste minimum engineering hours
* Get the product in front of early customers fast
* Use it as a base to build other products
* Test developer’s ability to build and scale product

There are some key elements to remember about MVP. Functionality (offer clear value to the user, Design (Build minimal but highest quality design), Reliability (Best production Quality) and Usability (Make the user experience easy)

Designing is much more than learning how to use design software. You can learn to design your mobile application yourself or ask someone to help you. But above everything else, the design is about understanding the product inside out, and its capabilities, features, and functionalities. The design should always keep the end-user in mind.

* Building User Flow / Diagram for each screen
* Creating Wireframes
* Choosing Design patterns, palettes, and elements
* Creating mockups
* Creating an animated prototype and asking testable questions
* Give final touches to the mockup based on user feedback

Most designers start by making rough sketches on paper. To simplify, wireframes are digital sketches, done using a wireframing tool, which you can also do using pen and paper. Wireframes are concepts, not finished designs. They simply help you understand the visual structure of your app’s features using low-fidelity mockups. When you are designing wireframes, the focus must be made on aesthetics and how the user will experience it. Color palettes and design elements are not required now. Wireframes are used to quickly understand what you want to be designed.

To not get confused between building a wireframe and a UI, it can get tricky. So, using a Style guides create a base for the process of long-term evolution, switching design and development between parties, developing for differences in the platform. It also helps in sharing topics. Some of the elements you can consider for mobile app style guides are as follows:

* Fonts
* Colors
* Layouts
* Graphics
* Components
* Menus and Bars
* Dialogs and Alerts

Now that we have Developed a strategy, analyzed a plan for the development and built a UI design. We will now begin app development. Most of mobile app development projects have three integral parts:

* Mobile Backend server technologies
* Application Programming Interface (APIs)
* Frontend development

What your users will see is the front end. The development that is required from the side of the server is the backend. Mobile app backends are used to store, secure, and process data. It refers to the activities that will happen behind the scenes when a user is interacting with your mobile application. Developing a backend for your mobile is used for sending information for processing on the server. Signups, logins, messaging, storing data on the cloud, answering user queries, and such other things happen in the backend. Applications like a calculator, camera, notes, compass, voice recorder, and such don’t require a backend development. They run on the mobile app without any network connectivity, or the requirement to store or retrieve data from a remote server. However, apps like Amazon, Netflix, and Uber can’t run without a connected backend.

Mobile apps have evolved into a state where they are constantly communicating with servers. Very few applications operate without connectivity, which means they use the backend, web service, or APIs. These APIs could be provided by companies like Amazon, Google, Facebook, or others, or developed internally by the mobile app development teams.

Most of the mobile API Development is done using RestAPI, which is also one of the simplest choices for anyone building mobile apps. It helps users quickly interact and connect with a remote cloud data server. However, making requests through the network can create major problems if not done right.

Developing an API is easy. However, teams evolve, and there is always going to be someone new looking at your code. Having a clear API process documentation can help you see the history, as well as the current state of API. This makes future updates easier. Another benefit of documenting your API development process is that it allows others to use your API. If you want other developers to use your API, you will need solid documentation to help you with the code.

Whether you use a readymade API or build your own, it is important that you keep the security measures in check. It is always an important component for developers. Moreover, it is crucial for mobile development. Developers must access control mechanisms, privacy control, and secret keys before invoking web-based APIs. There was a time when APIs had their own security. However, today, there are API standards like OAuth2, TLS, and Open ID to make the API integration simpler

Mobile App Frontend is what your users will see. Mobile frontend development includes a mixed bag of technologies. Some applications require APIs and backends, while others only need to work only with local databases offered by the platform.

Almost all web programming languages can be used to build the backend of your mobile application. If you are building native applications, you can use technology-specific offerings. For example, iOS applications can be developed using Objective-C, Swift Programming Language, Flutter, or React Native. Android Applications can be developed using Java, Kotlin, Flutter, or React Native.

After successfully developing an application, it is necessary that the quality of the application is ensured to be on-point. Quality assurance is a crucial phase in the mobile application development process as it determines the reliability, stability, and usability of the developed application. To ensure an all-inclusive testing process, there are a number of aspects that need to be addressed by following a complete testing cycle subjective to each application.

Testing can be broadly classified into two categories, manual testing, and automated testing. It depends on the type of application whether it needs manual testing or automated testing can give accurate results.

These are some required testing phases to de done before deployment

* Functional Testing
* Performance Testing
* User Experience & interface Testing
* Documentation Testing
* Security Testing
* Configuration Testing
* Platform Testing
* Recovery Testing
* Beta Testing

Mobile app deployment is also known as mobile app launch. Deploying mobile applications can be a tiring task, especially if the application is multifaceted, and required lots of testing. Here’s a short guide to help you launch.

Make sure it passes all the deployment tests. If you write an end-to-end unit and integration tests, make sure to check their output. Make them work anyhow.

Rebuild your application – Sometimes when obfuscating code on Android, developers use ProGuard, which can sometimes remove code, leading to app crash. Make sure you don’t shrink the code at the cost of usability.

If you already own a server, set up your CI flow using Jerkins, Bitrise, CircleCI, Travis, or Bitbucket Pipelines.

It is also essential that you perform static code analysis using Lint, ktlint, pmd, checkstyle, findbugs, detekt, gradle-static-analysis-plugin, OCLint, tailor, Swiftlint, Clang Static Analyzer, Infer, Swift Format, Swimat, or FauxPas.

Prepare a product version of your mobile app and release it for internal testing. Try to use crash reporting tools like Instabug or Fabric.

Preparing builds can be automated as well. For example, tools like Fastlane can help you automate screenshots, beta deployment, App Store / Google Play deployment, and code signing.

Monitoring engagement will help you discover user insights. You can integrate tools like Google Analytics, Fabric, Amazon Pinpoint, Mixpanel to discover active users, session intervals, time spent using the app, ScreenFlow, retention, conversion, and lifetime value.

**Conclusion**

Once the user installs the application, you should work on minimizing uninstalls, deliver the best user experience, keep up with the competition, and achieve maximum financial benefits in the long run. Regularly maintaining your mobile application to create a sustainable brand image in the minds of the users. Monitor the performance of your mobile application. Keep an eye on loading types, if there are any lags, or if there are any responsiveness issues. This will help you stay ready with your analytics report. Analyze your retention rates, churn rates, and try to understand usage patterns.

Keeping your user interface updated is also one of the ways to maintain your mobile application. Customers align themselves with changing styles, trends, habits, and other essential features of the apps that need constant updating. If you keep your app interface the same, your customers might gradually start preferring other competing apps with similar features.

Ensure that your app supports the latest software updates and hardware updates. A new version of the mobile operating systems is released every year. Think about how many mobile devices can be upgraded to the latest version of that so, and thus your app?

Fixing bugs can win customers. No software application is ever published with proper testing. However, bugs are an integral part of mobile app development. Fixing bugs can display your faith and dedication towards your users and towards your mobile phones.

Regularly add new features to your app. You can do this by observing how users are interacting with your app. With the help of insights received, you can discover what’s working for your user, and what isn’t

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