

What is Android SDK?

Android provides a rich application framework that allows you to build innovative apps and games for Android mobile devices in a Java language environment.

What is React Native?

React Native enables you to build world-class application experiences on native platforms using a consistent developer experience based on JavaScript and React. The focus of React Native is on developer efficiency across all the platforms you care about - learn once, write anywhere. Facebook uses React Native in multiple production apps and will continue investing in React Native.

What is Ionic?

Free and open source, Ionic offers a library of mobile and desktop-optimized HTML, CSS and JS components for building highly interactive apps. Use with Angular, React, Vue, or plain JavaScript.

Differences:

1. **Target platforms:** The first difference between Android SDK and the rest of the frameworks is that the Android SDK can be used only to develop Applications for Android while React Native and Ionic could create applications for Android and iOS, Ionic goes a bit further and creates apps for any web browser.
2. **Languages:** The main difference between the three solution for android application is that they use different programming languages. Android SDK uses Java, React uses JavaScript and React, Ionic uses HTML, CSS and JavaScript with the extensibility created by the JS frameworks. From this point of view, I can't say that one is better than the other because when talking about the better programming languages is a matter of subjectivism.
3. **UI Elements:** Another difference is how the UI elements gets shared between platforms. In this case, Android SDK uses his own native independent set of UI elements different from the ones from iOS, React Native comes with a little bonus and has a selection of Native UI elements specific for iOS and Android that are not shared. The ionic seems to cover a bit better this aspect and has Web UI elements that are shared across any platform, conforming to the native look.
4. **Performance:** when coming to performance, Android SDK is better, but with well written code the performance of applications made in React Native or Ionic is hardly distinguishable.
5. **Community:** I added this comparison because each Framework comes with it's good and bad parts and I thought the community that users, questions and examples are also important when learning a framework. Regarding number of questions on StackOverflow, Android SDK has 1.3 million questions asked while React Native has 73K and Ionic has 43K. Another community statistic that could help us compare is the number of developers that uses one framework, for this I used www.stackshare.io and from it's users 10.9K uses Android SDK, 10.7K uses React Native and 4.6K uses Ionic.

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Conclusion:

For application that target only Android devices the Android SDK seems to be the best to use. When thinking cross platform we have the options of React Native and Ionic. Between the two of them, Ionic seems to be a better choice because it can be used for more than mobile applications.

Personally, I would choose React Native because the difference with Ionic are slightly insignificant but has a larger community.