

## **Task 1 (Mobile Application Framework)**

- 1. With your knowledge on application development frameworks provide the framework solution you would propose to develop “ToDoNotes”. Justify your answer.**

In computer programming, an application framework consists of a software framework used by software developers to implement the standard structure of application software.

Application frameworks became popular with the rise of graphical user interfaces, since these tended to promote a standard structure for applications. Programmers find it much simpler to create automatic GUI creation tools when using a standard framework, as this would define the underlying code structure of the application in advance. Developers usually use object-oriented programming techniques to implement frameworks such that the unique parts of an application can simply inherit from classes extant in the framework that allows you to create a mobile application that can be installed as a native app.

A mobile app framework is a software creation platform that allows a developer to create an application's source code, the framework and uses various elements to generate the application for the different mobile devices.

Since this app will be made for mobile phones, JavaScript, Java, C++, Python and Objective-C can be used as the preferred programming language to code.

Native applications are developed for the chosen operating system written in a native programming language for the platform. For Android OS – Java and for iOS – Objective-C.

Hybrid applications are developed to work across any operating system and share the same code base.

While both types have their differences on how they are accessed, there are many mobile application development frameworks that support coding for both such as React Native, Ionic etc.

**2. Compare and contrast your frameworks with other available mobile frameworks stating the pros and cons (3 points each for pros and cons)**

For this build, I considered React Native, Flutter & Xamarin as the preferred app development frameworks.

|                 | React Native   | Flutter   | Xamarin   |
|-----------------|--|---|---|
| <b>About</b>    | Facebook introduced React Native in 2018. It has been built and maintained by the tech giant since its release. It is an open-source, cross-platform app development framework that has instantly become the preferred choice for developers. The significant reason behind the popularity of React Native is the rapid development and deployment of its application. Furthermore, it streamlines the development of iOS and Android apps. Some popular apps based on React Native framework are Amazon Prime, Tesla, Skype, Airbnb, etc. | Developed by Google, Flutter is one of the best mobile development frameworks in 2022. It is an open-source framework for creating cross-platform applications utilizing a single codebase. It is an excellent SDK (software development kit) for building a cross-platform application, as it uses an innovative strategy for designing applications with a native-like appearance and feels. Flutter is an unparalleled and highly dependable mobile user interface for building engaging applications swiftly by accelerating the development procedure.<br><br>Flutter framework contains widgets, a rendering engine, testing, and <b>various tools</b> to assist developers in creating and developing attractive mob applications. The flutter framework is used by renowned companies such as Alibaba, Google, and Abby Road Studios. | Microsoft developed Xamarin, an open-source framework for creating native and superior Android, iOS, tvOS, macOS, and watchOS applications implementing C# and .NET programming languages. Moreover, it lets users quickly transfer the scripts across multiple systems, like Windows and macOS.<br><br>Xamarin framework authorizes enterprises to deliver fast performance and innovative end-user experience. The framework is supported by a vast community that helps the designers to create an environment with various components, APIs, backend, and much more by employing different tools, programming languages, and libraries. |
| <b>Features</b> | Compatibility with third-party plugins   | Powerful widget support   | Feel of a native app  |
|                 | Reusable components  | In-built material design  | Storyboard files  |
|                 | Superior performance   | Rich motion APIs  | Compatible with numerous devices  |
|                 | It supports both iOS and Android   | High-performance app similar to native  | Adaptable backend infrastructure  |
|                 |  |   | Android SDK manager   |

Source: Hardy, T. (2022) "Top 7 Mobile App Development Frameworks in 2022," <https://ied.eu/>. Institute of Entrepreneurship Development, 26 August. Available at: <https://ied.eu/blog/technology-blog/top-7-mobile-app-development-frameworks-in-2022/> (Accessed: November 7, 2022).

Xamarin was taken out as it had the least popularity of the 3 since its release and sees less users as compared to React Native and Flutter.

## Pros and Cons of Flutter v React Native

### **Flutter**

| <b>Pros</b>   | <b>Cons</b>   |
|---|---|
| Hot reload feature offers faster app development    | Slowly growing developer community  |
| One codebase for Android and iOS platforms          | Library support is not as rich as native development  |
| Faster Quality Assurance                            | Apps written in Flutter are more immense than native ones   |
| Faster apps through Skia Graphics Library           | Flutter depends on Googles support for the project  |
| Older devices get the same app UI                   | Dart programming language is relatively new   |
| Compiled code offers stable performance             | All-new iOS and Android features are introduced in Flutter slightly later than in their native SDKs |
| Custom widgets and the apps have a user-friendly UI |   |

### **React Native**

| <b>Pros</b>   | <b>Cons</b>                        |
|---|------------------------------------|
| Hot Reload + Fast Refresh                             | Fewer out-of-the-box components    |
| Uses JavaScript that is more commonly used            | Abandoned packages                 |
| One codebase for Android and iOS platforms            | Compatibility and debugging issues |
| Freedom of choice for developers                      | Fragile UI                         |
| Vast community  | Apps bigger than native ones       |
| Slightly more mature                                  | Native developers still needed     |
| More comfortable to learn                             |                                    |
| The dev team can be smaller in size with React Native |                                    |
| Reduces testing time                                  |                                    |

### **3. Suggest a value-added feature for “ToDoNotes” showing your creativity**

A value-added feature I plan to incorporate into the ToDoNotes application is to have the task area be coloured so that the tasks stand out visually to the students.

### **4. What are the considerations done when deciding a mobile application framework?**

I considered the above factors and determined from the higher pros that React Native is the most advantageous for me to work with due to the support and recognition it has over the other frameworks.

### **5. State your favorite mobile application explaining why**

Name: Tachiyomi (Manga+Manhua reader)

Reason: This application allows the user to add multiple sources as extensions, view the selected books into one library and download and read them offline at your leisure. This app prevents the need of downloading multiple “reader” apps and checking different source websites for manga and manhua. The app also includes a global update feature which scans the added extensions and updates the chapters of the books you have added to the library.

Available on GitHub through the developer’s website as a downloadable APK file.

