

Name: JINGXUAN WANG
Name of Project Advisor: Linda S Milor
Group Name: The Original BUSCA

App Development Process with iOS and Andriod

Introduction

Inspired by the high demand of public study space on campus, the BUSCA project tries to find a way for the students to track seat availability without physically searching for one. In order for the information to be more accessible for students, developing applications on smart phones is an ideal approach. This technical review briefly summarizes the tools used in commercial App Development Process, evaluates different approaches to take and provides methods of implementation for the project.

Commercial App Development Tools

There are several advanced App Development tools that already exist in the market. Tools used for iOS are XCode, which is developed by Apple and uses swift, and AppCode which is developed by JetBrains and supports multiple languages including swift, objective-C, C++, Javascript, etc[1]. Although AppCode includes more functions and tools, due to the fact that it needs annual subscription at \$89/year, individual iOS app developers tend to be more satisfied with XCode [2]. Tool most popular for andriod is Andriod Studio with java as its underlying programming language and official IDE support [3]. The median cost to develop a mobile app in North America is \$150/hr for iOS and \$168/hr for Andriod [4].

Different approaches to take in app development

Platform-specific Native

Native mobile application development approach aims to maximize performance on specific platform. It could take advantage of native APIs without depending on plugins. Also, as there are fewer dependencies, platform-specific apps tend to be more responsive to upgrades to the platforms themselves. Another advantage is that native mobile apps could keep their UI consistent with the platform with native SDK [5]. However, native mobile apps suffer from poor portability and usually higher development cost if one wants to make the native app available on different platforms. There are also security concerns with data access when implementing native mobile app and special systems and methods are needed [6].

Cross-platform Native

Cross-platform native application development approach keeps some code shared across platform, but still runs the app natively. Common technology used for this approach are React Native, Xamarin and Native Script. This is an intermediate approach between

Platform-specific and Hybrid since the app could still be customized for platforms while staying cost-effective.

Hybrid

Hybrid mobile application development approach takes advantage of both web apps and native apps, aiming to maximize portability of the app on various platforms using web technology such as HTML, CSS and Javascript. It is relatively low cost since developers only need to write the code once and the app will be able to run on different operation systems. However, the hybrid mobile apps will not have access to the built-in features of smart phones, such as microphones and cameras, unless relying on plugins like Cordova [7]. Also, because future upgrades on the app will be influenced by patches on different operating systems, systematic estimation and testing of the app needs to be done beforehand [8].

Implementation of App Development Process into BUSCA

Since the project is not targeted for commercial use and that the major requirement of the app is portability across different platforms, the hybrid app development approach fits better into the project. The team should only implement the platform-specific approach if the team have enough time and want to improve performance and user satisfaction level of the app. Regardless of the type of approach used, the team will need to focus on integrating data collection with sensors, analyzing data with server based data processing and ways to visualize data on the app. The sensors need to operate at low power (probably with hibernate mode) and send data to edge-device whenever they are triggered. The edge-device can then collect data from sensors using Bluetooth and upload data to web server for processing using Wifi or Ethernet. With this information, the design team must decide on an algorithm that could efficiently interpret data into seat availability and update information on users' mobile apps accordingly.

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