Design and Implementation of a Mobile Application for a Question Paper App Based on Cordova Framework

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Abstract

In our day to day life, we come across many useful mobile apps, which are beneficiary for human life specifically for students for educational purpose- can be framed in this form. Our paper comprises of the creation of a question bank app, for the Karnataka PU board, Engineering and Commerce Students. Creation of the app is done with the help of apache Cordova software. The app is being developed mainly to help the Karnataka board PU, Engineering and Commerce students to achieve good marks in their examinations and to mould a good future for them. This app helps students to build confidence during examinations.

Keywords: *Cordova, Hybrid, Mobile, Application, Android, iOS.*

1. Introduction

Distinctive kinds of APPs are introduced into the mobiles in our day-today lives. Our point is to make an application for University where they can offer types of assistance which reaches to everyone of its students. The principle goal of this project is to develop an effective but simple app for students. We give an interface on android and iOS gadgets, with the goal that PU, Engineering and Commerce students of an University will have the option to download their past question papers and question banks for the simpler and better comprehension of the question paper designs that they will look at their tests and exams. It additionally helps the very last minute reader a relief to concentrate just the significant questions which are most as often as possible posed and spare their time to read unnecessary topics which they can skip which are not in their current syllabus.

In any case, programming languages and tools used for creating mobile applications are specific to each platform. Java is used to create an Android application and similarly Objective C is used to create an Apple iOS application and we cannot write a same type of code for application to be deployed in both of these platforms. Therefore implementing an App that runs on every

platform is one of the major technical challenges affecting the mobile development community. This paper is about developing a cross-platform mobile application for viewing of previous year question papers of engineering, commerce and PU streams of a University.

The mobile Application developed can be deployed on different App Store portals like Google's *GooglePlayStore* and iOS's *AppleAppStore*[4].

Further in this paper, in the section we discuss the state of art in the educational Apps used for examination preparation purpose along with the brief description on the Cordova framework features and followed by that in section.

2. Literature Survey

a) Need of Mobile Apps for Current Generation Student

The ease of lifestyle with the advancements in technology is tremendous. So is the lifestyle of the student also being affected due to this advancement. A recent survey has found out that the teenagers rely mostly on their mobile phones, which makes this app easily accessible to their subjects. Around 95% [7] of students refer to the question Bank and question paper to look for the most

occurred question and to look what type of questions can be asked. While a study show that only 45% of the students study one day before the exam so they have to study only important topic to get good marks or to get the passing marks. Moreover it has been noticed that the use of educational applications resulted in promoting self centered learning where students engaged themselves in learning by themselves and thus developing self learning skills [9]. We have seen in [5] that there exist many apps that are used for online learning and teaching purpose. So, Engineers need to develop a good software application to satisfy user or client requirements [6].

In paper [8], the author says that typically, two teams of programmers are required to develop UIs(and its underlying functionalities) for Android and iOS platforms which makes development practises costlier, to reduce costs we can write a code which transfers the GUI code for the target platform using cross-platform code generation framework like Cordova. Also, in paper [10] the author believes that mobile devices have become a vital part of human life. Wherever we go the mobiles devices has always been with us, so they are no longer just used for communication, but also for learning and development.

b) Cordova Framework

Apache Cordova is a mobile application development platform which allows developers to create mobile applications using HTML5, JavaScript, and CSS3 through a set of Cordova development tools [1]. Cordova is also free and open source software which can be downloaded from its website. Applications execute inside these technologies focused to every platform, and they depend on standard API bindings to get to every gadget's capacities, for example, sensors, information such as data, network status, and so on.

Cordova streamlines the advancement of mobile applications by helping to develop a single application on different mobile platforms without having to write separate code or to re-implement the application code on every platform[2].

A Cordova Application is organized by following folder structure shown in fig 1:

Where each folder and file has its own purpose in this work, namely:

-**Hooks**: A Hook represents special scripts which could be added by applications to customise Cordova commands that will run at a specified time. This folder contains the code for which the application should perform an action related to this work. It will be related to our application activities such as before build, after build, etc.

-**Merges:** as Cordova is situated to create cross-platform applications, possibly there are codes or perspectives that should just exist in a particular platform. This present's organizer will probably make or overwrite any record inside to get a ready time contingent upon the stage in which the activity is performed. Envelope

structure ought to be:/merges/platform-name/fileToBeOverwritten.js.

-**Platform:** This folder stores the native files generated. for example, in a build the results of Cordova commands like $*Cordova build platform* are stored here.

-**Plugins:** This folder has a comparable intention that the previous one has but it stores plugin code and dependencies.

-**www:** a Cordova application depends on a Web App inserted in a native Web View. This folder contains the WebApp that will be introduced as mobile application. The respective css, JavaScript and html codes will be written in their respective index files.
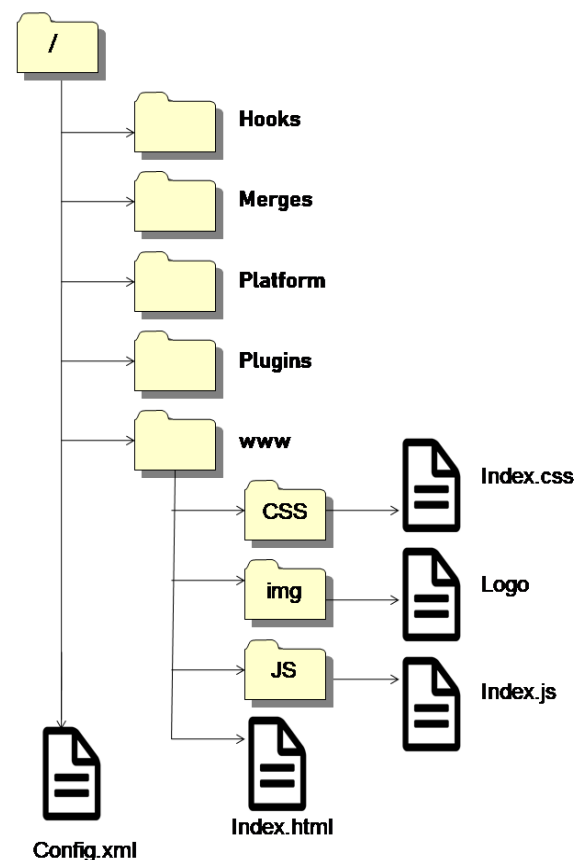

Figure 1: Apache Cordova folder structure

-**config.xml:** It is a global configuration that controls many aspects of Cordova applications. This xml file is extended to specify core Cordova API features, plugins, and platform-specific settings.

c) System Requirements

• **Hardware Requirements:**-Computer/PC, Mobile (android, iOS) with good internet connection**.**
• **Software Requirements:-**Brackets (text editor), Apache Cordova (mobile app development software).

d) Architecture

In this subsection, we will clarify the engineering of the

whole undertaking, from the plan stage and usage subtleties to server necessities. We are going to look at Apache Cordova architecture, concentrating on every detail and its connection with the implementation of our Application. At long last, the connection between them will be plot.

- **DB connection interface**: all the information (question papers) required by the mobile application is put away in databases in the cloud. This interface limits disappointment if there should arise an occurrence of database changes.

- **Cordova application**: the fundamental super module of the venture. This is used to implement the logic and the perspectives of the application.

- **Mobile OS**: The end user uses mobile OS to run the Application.
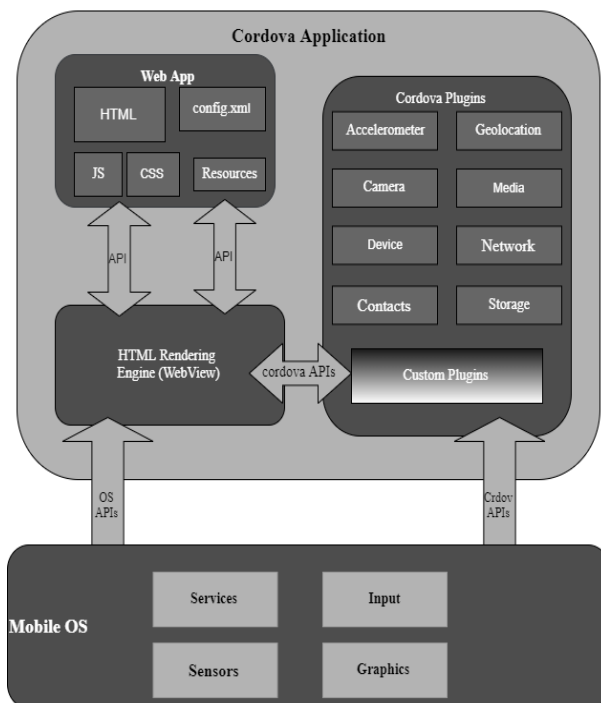

Figure 2: Cordova Architecture

• The HTML components contains the perspectives on the Application. Its capacity is to speak to all the substance required by the application, so the client can without much of a stretch comprehend the application structures to get to the records.

• Business rationale is actualized through JavaScript programming language. JavaScript isn't totally required for the usage of our venture.

• As this Application is certifiably not a one-platform development, numerous examples are accessible for choosing the structure, all the more decisively they are the Material Design by Google and the iOS Human Interface by Apple, so the plan will be actualized utilizing CSS module.

• Apache Cordova accompanies a wide scope of plug-ins which permit us to control local highlights from any

stage. These plug-ins have no significant job in our undertaking.

• Mobile OS comprises of the considerable number of services, information, sensors and illustrations(graphics) consolidated inside the application.

3. Our Proposed Approach

We have combined the best strategies and procedures that are available which has helped to determine how best is to design and build up an undertaking Project. First, we will utilize Cordova to make a stage to actualize the application. This stage wraps our HTML/JavaScript into a local compartment which can get to the gadget elements or functionalities of a few devices (like android, iOS). These capacities are uncovered by means of a brought together JavaScript API, permitting us to effortlessly compose our arrangement of code which runs on every kind of phone or tablet available today.

From the below figure 3 we can see that the application will be seen from clients mobile or tablet. The client who has great web connection can look among streams and subjects in the application. At any point whenever student needs question paper of that specific subject, he can tap on it, when student taps on the application, question papers are retrieved from the database , then it will be demonstrated or shown to the client. The itemized perspective on how this functions is clarified underneath.

• For the APP, the main page contains all the different streams where the question papers are available. The user can go to the desired stream and afterwards its primary page, where it will be stacked onto the mobile's screen as shown in figure 4.

• The user can choose the desired subject from streams primary page, at that point it shows the semesters accessible to that specific stream. After choosing the semester, it loads into another page where all the subjects of that semester will be appeared.

• The above strategy will be applied to each stream aside from PU since PU students would almost certainly be to get to question papers dependent on the year. Along these lines, when they click on the ideal subject its earlier year question papers and the question bank of all chapters of that subject will be displayed.

• On selecting the desired subject, its particular question paper is shown to user on the screen in the pdf form, where the pdf will be accessed from the Google docs database, the way in which the pdf is accessed is shown in figure 3.in this figure the mobile sends an http request to fetch document from our database, upon retrieving the documents, it is shown to the user.

• The client can download these pdfs for future reference, or they can get them at whatever point they need through the application.
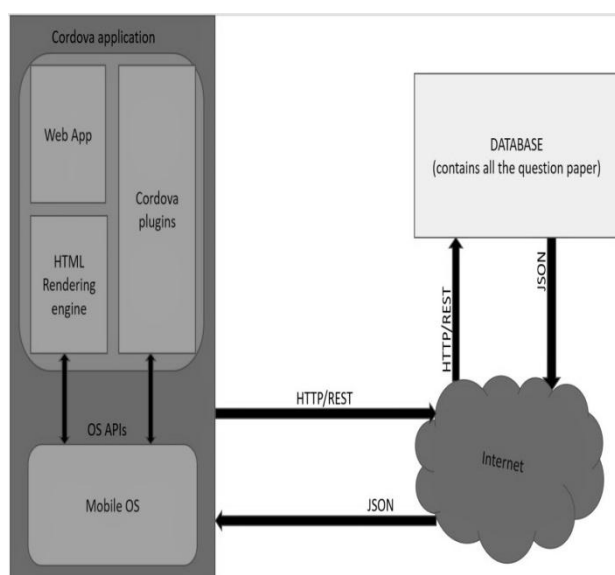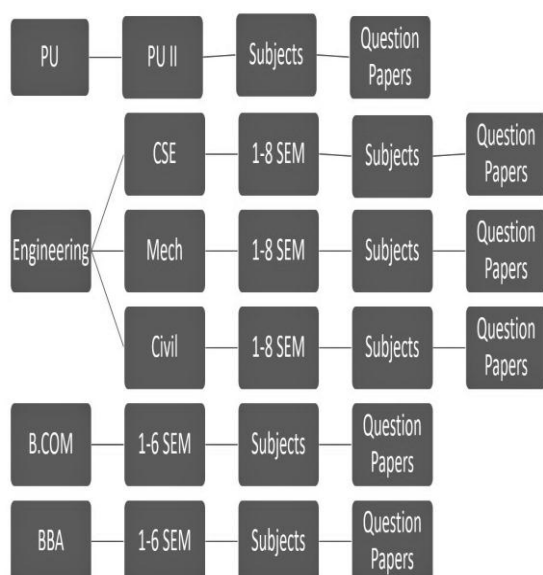
Figure 3: Data flow model

Figure 4: The template of interfaces inside the app

4. Results

In this work, an application for students has been developed and implemented successfully by utilizing the Cordova Platform. Where in an interface is provided which can be used by the students of various streams can utilize this feature along with the option to download the question papers of required subjects. Not just the download feature is available but the intended student is also able to see them as often as possible posed questions to set themselves up , with the goal that they can easily understand the question patterns and the subject which would help for their Exams.

With this work, we are able to save the maintenance time and support required for the development of the APP and maintaining it. Various features such as fiddling with the user interface, adding, removing and modifying any of the feature to the app and also fixing of errors is easy as compared to other app development frameworks.

Another added advantage of using this Cordova framework is that its bases on the usage of basic platform knowledge and skillset in simple HTML5, CSS and JavaScript which we study in our regular curriculum. It does not need any expertise as required for other app development frameworks.

Finally the advantage of our work is that it could be completed with simple hardware requirements.

5. Conclusion and Future Scope

In this paper we have developed a portable Application for a University question paper application, where the most normal users activity of effectively downloading the question paper should be possible. For this reason, hybrid programming has been the procedure followed to faster developing time, specifically, Apache Cordova permits us to take our web application and have it become a native application that we can then submit to the various app stores.

This undertaking has built up the customer side of the engineering, which is framed by two modules, the versatile mobile OS and the Apache Cordova application. The former offers some local highlights like designs and administrations. The last is the place the Web App will support to give every one of its features. At last, the server side of this undertaking is capable of putting away all data(question papers) and giving them to the users who all have utilizing the App.

We can conclude that from the above work, the students learning experience can be improved and this app can be an addon to improve the academic performance among the students. The easy accessibility and user friendliness of the apps helps the students to involve more into academic activities of examination preparation.

6. Acknowledgment

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