College Schedule Notification Using Cross Platform

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Abstract— Mobile device and mobile computing have made tremendous advances and become ubiquitous in the last few years. Native approach of mobile development still is the predominant way to develop for a particular mobile platform, recently there is shifting towards the development of cross platform mobile application. In the traditional system we don't usually provide notification to the user only a border view of schedule is displayed. In this proposed system we will provide notification to the user about their schedule. With the result of the survey, it is argued the web based approach and in particular hybrid approach of mobile development serves the best for cross platform development. Using the hybrid approach a prototype of application has also been developed and built into native application for different platforms. This has helped to get a better in site about the domain of cross platform development; its main advantage is of unification of the development and testing process. In this, there will be a message send to the user about different lectures, practical, exams, assignments and college events. Other than this if there is any message to be conveyed to the students, it can be done. This system will be platform independent built on cross platform. The main focus is to have single source code for all the mobile operating systems. In an era where application developers today aim to maximize target reach Cross platform mobile application development shows us the path by truly providing a "Develop One Time, Deploy Anywhere Anytime" solution.

Key words: Cross platform, Mobile device, schedule, hybrid approach, Native approach, web based approach, unification

I. INTRODUCTION

In this paper we present our experience from working closely with push messaging technologies. Specifically, we compare different technologies that are available for the Android platform, from the standard library provided by Google to commercial options. In total we will look at four alternatives that all provide similar push messaging features, for different platforms. We believe this gives us an in-depth look at the state of the art in integration between cloud computing and the Android platform not found in existing research. On the server side we have used the Google App Engine as the cloud-based platform.

We are implementing the cross platform application for reducing the disadvantages and limitations of existing system. Updating and managing the college schedule is very important for the student as well as staff. In the existing system all students follow the college time table by noting down it into notebook or every time watching it on noticeboard. For the staff it is also very difficult to provide detail information about time table, events, exams etc to every student personally. That is why we are implementing this application for students. Current system for providing new notice and new time table is based on paper work. Student needs to go to the notice board in search of new notice. Sometimes if teacher want to announce something important then they have to announce it orally in classroom or displaying that notice to noticeboard. So this system is very time consuming for student as well as staff also. Dynamic update in events or in schedule sometimes not notified or is missed. Students then losses interest. Also our application is work with the help of Phone-Gap which is nothing but cross platform development environment. So that this proposed system will be helpful for the student. Also Cross platform system have a Global reach.

II. LITERATURE REVIEW

Review of the papers, Description, Mathematical Terms. A literature review is the study of what has been published on a topic by accredited scholars and researchers. Literature review tries to convey to all the readers what knowledge and ideas have been established on a topic, and what are its strengths and weaknesses. The literature review is important because, it describes how the proposed research is related to prior research in statistics, it shows the originality and relevance of research problem, it justifies our proposed methodology, it demonstrate our preparedness to complete the research work.

A. Traditional system

Updating and managing the college schedule is very important for the student as well as staff. In the existing system all students follow the college time table by noting down it into notebook or every time watching it on noticeboard. For the staff it is very difficult to provide detail information about time table, events, exams etc to every student personally. That is why we are implementing this application for students. Current system for providing new notice and new time table is based on paper work. Student needs to go to the notice board in search of new notice. Sometimes if teacher want to announce something important then they have to announce it orally in classroom or displaying that notice to noticeboard. So this system is very time consuming for student as well as staff also. Dynamic update in events or in schedule sometimes not notified. Student also losses interest. So that this proposed system will be helpful for the student.[3] The cross-platform mobile development as an alternative to native mobile development; how can they be achieved, how can they tackle the aforementioned challenges in mobile development, and what benefits can they bring. So it is envisaged that a literature survey followed by the prototype cross-platform mobile application development will help better understand these questions.

To put it succinctly, the work will be aimed at investigating the mobile development approach that leads to cross-platform mobile solutions which can help to alleviate those mentioned challenges and problems.

III. PROPOSED METHOD

In our proposed system, we are developing an application to send messages to the students. Messages can be related to

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the latest happenings in the college or some kind of important notifications. Mobile application development in recent times is growing exponentially. Today each and every person in this world has a smart-phone in his pocket. Smartphones combine a range of functions such as media players, camera and GPS and many more with advanced computing abilities and touch screens are enjoying ever increasing popularity. Cross Platform Mobile Application Development is the development of mobile based applications so that the development of these types of applications can be made Platform - independent.

A. Module Details:

There are different modules that we are include in our application:

1) Time table: In this module we are sending the notification of regular college time table.
2) Exam: this module contain the information about all types of exams for example Oral , practical , internal and external exams ,backlogs papers etc.
3) Event: Every college arranging the different events which may be technical or non technical. This module contains all information about all events.
4) Notices: If there is any guest lecture, workshop , or campus interview then all details about that are included in this module.
5) Assignments: If any staff want to give assignments to students then all that assignments get stored in this module.

B. Architectural Review

The following figure fig: a, shows the system architecture of the proposed system.

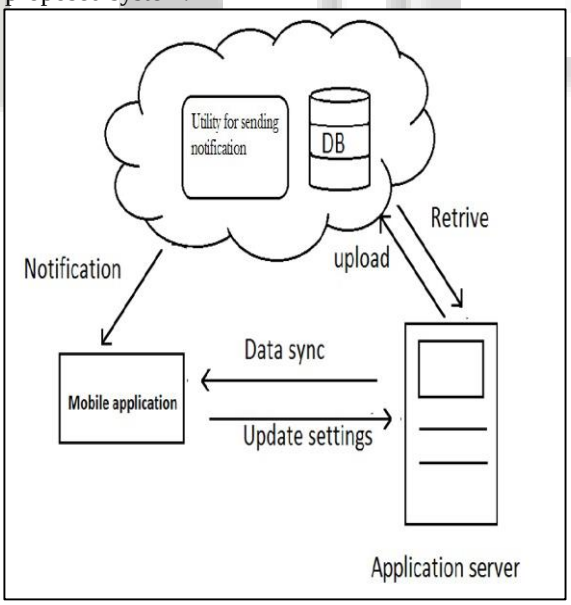

Fig. 1: proposed systems architecture.

The proposed system is get divided into different types which are as follows:

User login and setting:

When user first time installs the application in his device then that time he/she has to login that is he/she has to enter the user id and password. Once the registration id is generated it sends to the system then system starts sending notification to user. If user want to change the id and password then it is possible, the newly generated id and password get stored into database. User also enables to select the notification type.

Admin login and setting:

Like user admin also have to login first time. Here admin only manage, update and maintain the details about the modules.

Database: The cloud database

Contain the information about user details , notification setting and information of all events , exams and time table of student.

IV. CROSS PLATFORM APPLICATION DEVELOPMENT TOOLS:

Now the Comparison of latest cross-platform mobile application development approaches which are currently available in the market. Some of the cross platform mobile application development approaches are Phone Gap Titanium, Unity etc. To distinguish between approaches that employ a run-time environment and those that generate platform-specific apps from a common code base at compile time. The latter, generator-based category includes model driven solutions and cross-compiling. Up to now, there are no production-ready solutions of this category.

Some of the examples of cross-platform application development tools are Phone Gap, which is a Hybrid framework and Titanium. The most prominent hybrid framework till date for cross platform application development is the Phone Gap. Phone Gap was originally created by Nitobi Soft-ware, which has been acquired by Adobe. The development now takes place in the Apache Cordova project of the Apache Foundation, of which the Phone Gap is a distribution.

A. Phone Gap

The main aim of our project is to develop an application which is to develop an application which would support various mobile operating systems. We have implemented that application using the "**PhoneGap Framework**"[1]. This framework creates a language for different operating systems which would help developer to create the application properly. This is been described in the following fig b.

This figure shows the complete architectural schema of the Phone Gap framework.

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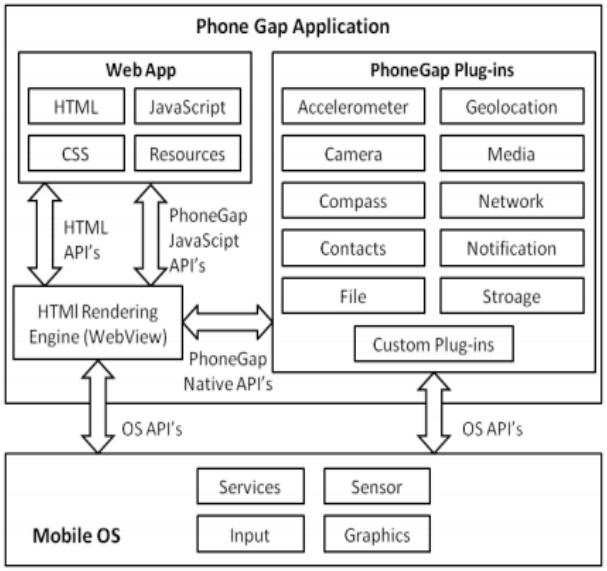

Fig. 2:- Complete schema of phone gap architecture.

B. Push Messaging on Android:

The technologies used in our experiment all deals with the integration of cloud computing and mobile applications. Not all push messaging technologies investigated are directly related to cloud computing, such as XMPP (Ex-tensible Messaging Presence Protocol). However, it is well integrated with the Google App Engine and is there- fore included in our test.

In our benchmarking test we considered a total of six alternative technologies that offers push messaging for Android. These libraries are currently the main competitors in the market. SMS was not considered as part of the push messaging libraries, this was because of limitations such as availability and cost. Specifically, we conducted the test on a tablet device, Samsung Galaxy Tab 10.1, which does not support SMS.

The libraries we found particularly interesting are: *C2DM*, *Urban Airship*, *Xtify*, *XMPP*, *MQTT* (Message Queue Telemetry Transport) and *Deacon*. Although we believe these technologies present the most promising and useful push messaging libraries on Android, we cannot completely rule out the possibility of other interesting options we were not able to find[5]Of these alternatives, we did not go into detail for two specific libraries, namely MQTT and Deacon. MQTT was not included because we wanted to investigate push- messaging technologies that can be easily integrated into the cloud, and specifically on the Google App Engine. MQTT is useful for connections that require a small code footprint and where network bandwidth is limited. It does require a message broker hosted on a separate server. We did not find an easy way to integrate these services with the Google App Engine.

The second technology, The Deacon Project , is an open source project providing push notifications to Java and Android applications. We felt that this project was the least mature technology of the options that we have considered, as it is currently in beta release. The project also states that it is created for users wanting to run push notifications on their own server and support Android versions lower than 2.2, whereas C2DM requires at least Android 2.2. None of these requirements matched what we wanted to investigate, which included a close integration with a cloud-based server application and devices running on at least the 2.2 version of Android Operating system.

1) XMPP

The first push-messaging technology we include in our test was the XMPP protocol. It is created for real-time communication and for streaming XML. The technology behind XMPP was created in 1998 and then refined in the Jabber open source community in 1999 and 2000, before it was formalised by IETF (The Internet Engineering Task Force) in 2002 and 2003. It is commonly used in Instant Messaging (IM) and has been used by Google Talk, Jabber and other IM networks.

XMPP is offered as a service on the Google App Engine, making it possible to write cloud-based applications on the Google infrastructure that is able to communicate with users or applications. Accordingly, we integrated with XMPP through the Google App Engine infrastructure. Our Android client used an XMPP library called asmack , which is a patched version of smack created for Android. Smack offers an XMPP library and it is a pure Java implementation. XMPP on the Google App Engine has a daily limit of 1 GB data sent and 100,000 invitations with the free default limit.[5].

C. Benefits:

It helped us to achieve a difficult task of running unmodified IOS binaries on the Android subsystem. And also the way to understand the various parameters through which we can distinguish between various cross-platform mobile application development tools which are currently available in the market, some of these parameters were launch time, type of GUI, security performance,eligibility,compatibility etc.

This research paper also helped us to understand how these cross-platform mobile application development tools perform and on what technologies they are based on. One of the ways by providing a deep insight on the latest technologies on which cross-platform mobile application development tools. Some of these technologies were HTML5, jQuery , jQtouch, HTML5 and CSS are used to design web applications which are platform independent.

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D. Data flow diagram:

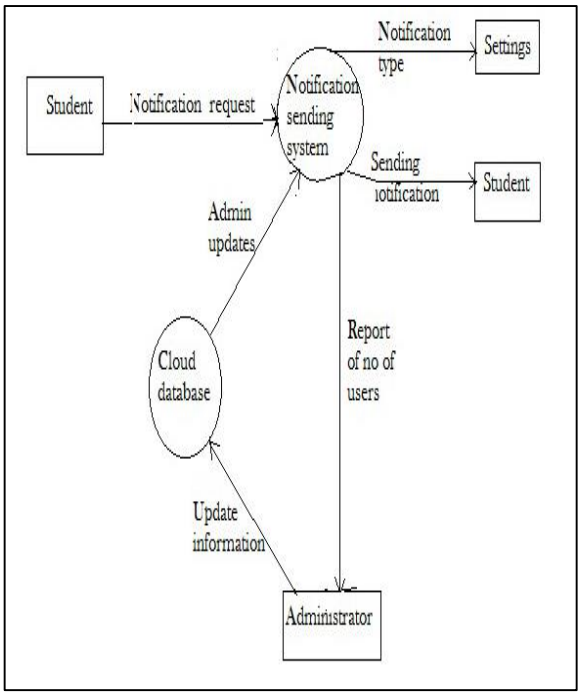

Fig. 3: data flow diagram of the system

The fig c shows the data flow diagram of the system. It depicts how the messages and notifications are being sent between the student i.e. user and the administrator. It makes use of different types of calls like notification type, update, request, settings.

V. RELATIVE TECHNOLOGIES

A. WAP and WML:

Wireless Application Protocol (WAP) is a technical standard for accessing information over a mobile wireless network, It's a wireless communication standard. A WAP browser is a web browser for mobile devices such as mobile phones that uses the wireless protocol. For WAP version 1.X, the primary language is Wireless Markup Language (WML). In WAP 2.0, the primary markup language is XHTML Mobile Profile.[1]

B. HTML, CSS and JavaScript:

The Hypertext Markup Language (HTML) is the common programming language among web browsers when displaying web pages. HTML combines the content of a page, such as images, links, text and scripts. The markup language uses CSS to give a web page a more suitable layout than just plain text and is more interactive. CSS adds color, font, text size and disposition to a web page. JavaScript can be included to a HTML document to give a page some interactivity, e.g. changing the color of a button when the mouse pointer is hovering over it [1].

VI. ALGORITHMIC STEPS:

1) Upload or delete the added files on the server.
2) The server should push notify the application regarding any upload/deletion of file.
3) Receiving push notification should be working correctly although the application hasn't running beforehand and wake up once the notification comes.
4) Receive push notification on the client device with the appropriate alert message.
5) View the updated storage media on application running on client device encase of any upload/delete of files.

VII. THE FILE UPLOAD PROCEDURE:

The following figure fig d, shows the file upload procedure. In it there are different methods has been used. We also need to find out the number of registered users for sending up the uploaded file. If there are no registered users then it shows an empty list else it shows the registered users list. Then using these users the appropriate message is sent to then. Then after that using different procedure and methods the file is been uploaded.

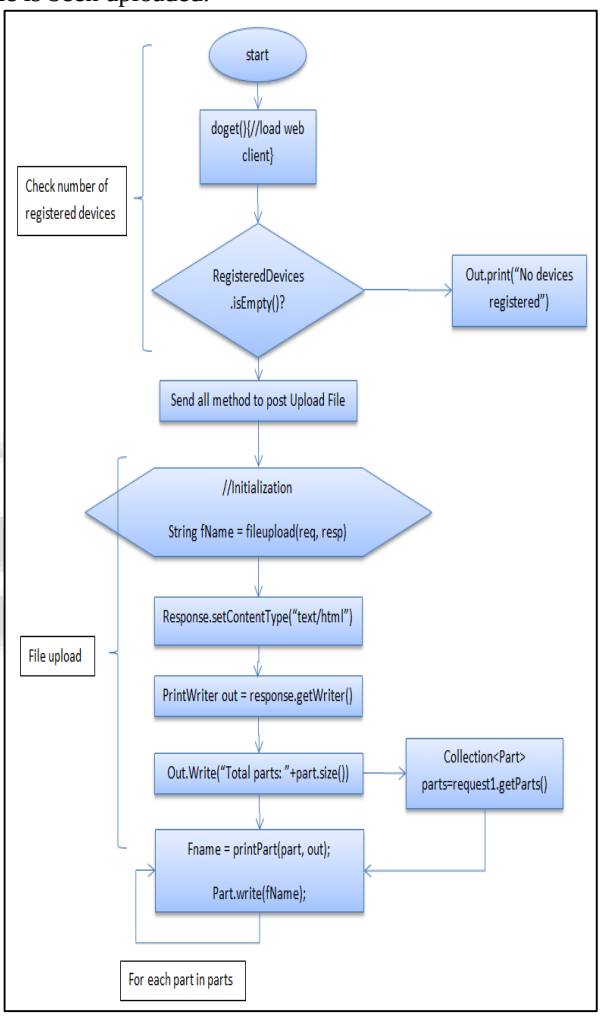

Fig. 4: flowchart to show the file uploads procedure.

VIII. NATIVE APPLICATION

A. Application for Android OS

This module will target the Android Operating System. We would be creating installable and executives for all the Android Operating Systems which will be installed on any Android device from different mobile technology companies like High Tech Computer Corporation, SAMSUNG, LG etc.[3]

B. Application for Windows OS

This module will target Windows Operating System. We would be creating installable for all the Windows Operating

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Systems which will be installed and run on any Windows device from different mobile technology companies like High Tech Computer *Corporation*, Nokia etc.

C. *Application for Blackberry OS*

This module will target Blackberry Operating System. We would be creating installable for all the Blackberry Operating Systems which will be installed on any Blackberry operating system device from different Mobile Technology Companies like Blackberry etc. [3]

D. *Application for iPhone OS*

This module will target the iPhone Operating System. We would be creating installable for all the IOS which will be installed on any IOS device from different Mobile Technology Companies like APPLE.

IX. LANGUAGES USED

A. *HTML 5:*

HTML5, the 5th version of HTML, is the latest web technology with rich multimedia features and interoperability features for Smartphone's and tablets makes it compelling and doubtable. HTML5 provides offline support through local data and application caching without the need for internet connection. The API's and Document Object Modelling (DOM) are now fundamental parts of the HTML5 specification. It has improved functionalities. HTML5 web application can be accessed on mobile browsers also and runs on different mobile platforms just like the native applications.[3]

B. *JavaScript*

It is a high-level, dynamic, untyped and interpreted programming language. Alongside HTML and CSS, it is one of the three core technologies of WWW content production. JavaScript is used in lots of Web pages to improve design, validate forms, detect browsers, create cookies, and much more. The virtual machines and the platforms built upon them have also increased popularity of JavaScript for server side web applications. This scripting language is JavaScript is popular scripting language on the internet, and works in all major browsers, such as Internet Explorer, Mozilla, Firefox, Netscape, Opera.

C. *CSS3*

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation semantics (the look and formatting) of a document written in a mark-up language.CSS frameworks are pre-prepared libraries that are meant to allow for easier, more standards-compliment styling of web pages. Its common application is to style web pages written in HTML5 and XHTML, but the language can also be applied to any kind of XML document including XML language, Scalable Vector Graphics and XML-based User interface Language. They provide a number of readymade options for designing and laying out the web pages.

D. *JQuery Mobile*

It is an HTML5 based user interface system designed to make responsive web sites and apps that are accessible on all Smartphone's, tablets and desktop devices. It supports cross platform- instead of writing unique applications for each device or OS, the JQuerry mobile framework allows you to design a singly highly-branded responsive web site or application that will work on all popular smartphones, tablets and desktops. JQuery is a fast & concise JavaScript Library that simplifies HTML document traversing, animating, event handling and Ajax interactions for rapid development. JQuery is designed to change the way that you write JavaScript.

X. IMPLEMENTATION

The implementation and the GUI of the system is very interactive and is easy to understand. Thus the navigation becomes very simple. There are two sections i.e. one on the administrator side and the other on the users' side.

A. *LOGIN SCREEN & REGISTRATION*

To track the usage of the application. Single Sign On-App will ask only once the login next user visits app will remember the credentials

The following snapshot as in fig e., shows the admin side view where he will operate and all the functionalities are been described.

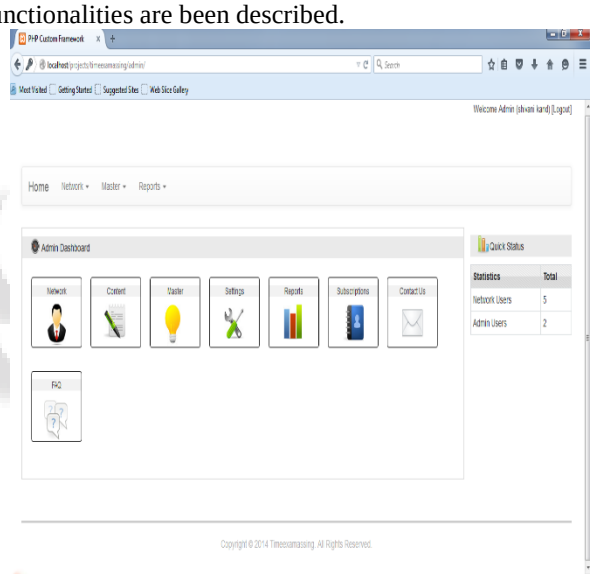

Fig. 5: Administrator side dash board

The following snapshot as in fig f describes the registration screen on the user side, where the user is going to register itself and his/her details are been recorded and displayed on the administrator's dash board.

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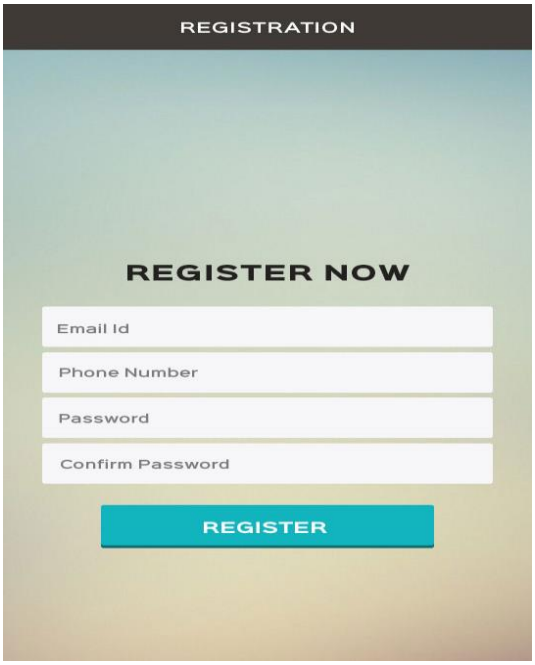

Fig. 6: Registration screen

The next screen is of the different modules that are available for user to navigate through the system. The updates given by the administrator is been reflected in these respective modules and it is shown in fig g.

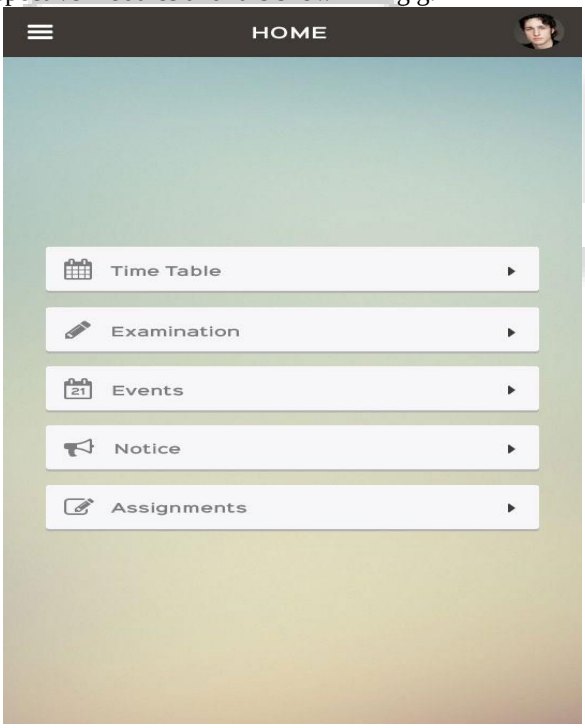

Fig. 7: different modules available in the application

XI. CONCLUSION

Though native approach of mobile development allows the developers to exploit the full potential of the device hardware and platform features, it will not always be the best approach when it comes to mobile development. While applications are getting diverse and user bases will be expanding, there will not one clear platform of choice. During this tug of war, application developers will face with the debate of whether they should be designing cross platform applications or multiple applications for different platform. Overall, when including all aspects we found that C2DM provides the best results. This is especially so if one does not need messages pushed frequently over a short period of time. In these cases XMPP also a good alternative, because it provided the best response times in our evaluation. In this paper, we propose a cross-platform application development using PhoneGap framework. This paper introduces the study and design of Student Information System based on mobile device in order to enhance the management efficiency and service quality. The system is easy to deploy, safe and convenient to use. The practical value of mobility in teaching will be greater in the future because mobile devices are flexible, easy to use in real time. PhoneGap is used for cross-platform development of mobile apps for multiple platforms by using standard web development technologies. This can also be integrated with cloud computing, which is the future scope of our project.

ACKNOWLEDGEMENT

This research work was support by Prof. B. S. Tarle, our project guide and HOD of Computer Department of NDMVP'S KBT COE Nashik. We thank him for guiding us and providing insight and constant motivation which greatly assisted our research work. We would also like to show our gratitude to Dr. Prof. Jayant T. Pattiwar, Principal NDMVP'S KBT COE Nashik and Management of NDMVP Samaj for providing all necessary facilities and their constant encouragement and support.

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