Hi-Tech Wireless Notice Board using Google Cloud Messaging (GCM) and Push Notification

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Abstract— The purpose of this paper is to invent new technology to transfer information from teachers to students and vice versa. Notice board is primary thing in any institution/organization or public utility places like bus stations, railway stations and parks. Notice boards are very much important in educational institutions. But sticking various notices day to day is difficult process. A separate person is needed to take care of these notices displayed. This paper deals about an advanced hi-tech wireless notice board. The project includes two models i.e. android application and web application. Web application is totally handled by administrator of that institution. Android application is use by students as well as teachers. The notices send by administrator through web application is received to student's smartphones.

Key words: Android, Google Cloud Messaging, Push Notifications, C2DM and APNS

I. INTRODUCTION

Remote access to web content is of utmost importance. Searching for information on internet can sometimes be the most straightforward job, but on other occasions a laborious and frustrating task for both experience and casual users. People are gathering a considerable amount of information from shared information's by their friends/acquaintances.

Additionally, the need of aggregated news on single web site software makes the news aggregators very popular and a successful business possibility. Furthermore, people are creatures of habit when it comes to web activity, which is very similar to the actual "autopilot" navigation that is present in nature. We all have are daily routine when it comes to starting the day on the web. Some do it when they wake up, others at their work place. What is in common is that we all do it, expect that we just have different habit such as opening the mail inbox, replying emails, checking the daily news and friends activity, etc. Not all sites provide push services and enabled notifications. In fact, there are only few sites, such as sport news or similar information sites that send push information to customers. The new digital era initiates situations where, a lot of people are waiting for a notification to appear on certain web pages. For example, one would like to find out if there is a change in a given property case the user is frequently visiting all those websites looking for a given text or keyword. This is one of the reasons for the success of feed gathering systems that provide data from multiple sites on a single website or software based on the user required feed.

Our project is to build a cloud based system that provides an engine for site indexing and automatic feed creation for all of the sites. The overall idea is to realize this as a service. We call the new service Alert Notification as a Service (ANS) because of its notification features, and place it in the cloud as a novel cloud service. Additionally, the service provides a possibility of a variety of notification services such as: E-mail, Facebook notification, Skype notification, Google Cloud Messaging (GCM), SMS, Twitter, LinkedIn, etc. This novel cloud service can be offer to the end user, but also to the cloud service providers in order to provide better indexing for their hosted sites, and they can also offer this a service. By doing this, the sites will not be burdened with the RSS feed requirement and in the same time the user may get to the much results quicker and in the form they require.

The combination of the smartphone and the internet service is the trend of the future information development and software application. Mobile phones are the most commonly used communication tools. Using mobile phones to get information is not only quick, but also more convenient way to improve people's lives. Notice board is primary thing in any institutions/organization. But sticking various notices day to day is a difficult process. A separate person is needed to take care of notice board. This project deals about an advanced hi-tech wireless notice board. We are trying to develop an android application to solve problem related to normal notice board.

This paper aims at developing an android system and will be using cloud to store data. While e-mail is the way to converse privately with one or more people over the internet, electronic notice board are totally public. Any message posted by some other person can be read (and responded to) by anyone else who has this android application which provide message board. In this system facility is provide for all the events which will be conducted in our college. It may be related to training and placements, cultural events or may be related to any small activities in college.

So the paper presents related work in area of ANS, GCM, and C2DM in section II. Section III, describes about the proposed system. In section IV implementation work is described. Section V, discuss about the future work and the paper concludes in section VI.

II. LITERATURE SURVEY

To push multimedia information to mobile devices, feature phones have used SMS and MMS. Mobile network operators have offered these services to their subscribers so that they can exchange text messages, images and videos. However smart phones need more extended push functions than SMS and MMS. They cannot send messages to a special mobile application in a smartphone. To solve this problem Apple introduced APNS and Google introduced Google Cloud messaging (GCM) and C2DM.

A. APNS:

APNS is a push notification service framework made by Apple for iPhone mobile application. Because iOS has not

supported background process, mobile application could not get messages by polling mechanism. Therefore, the application that wants to receive messages from the remote servers can use APNS framework. It is implemented in iOS 3.0 or above. Figure 1 shows the flow of APNS messages.

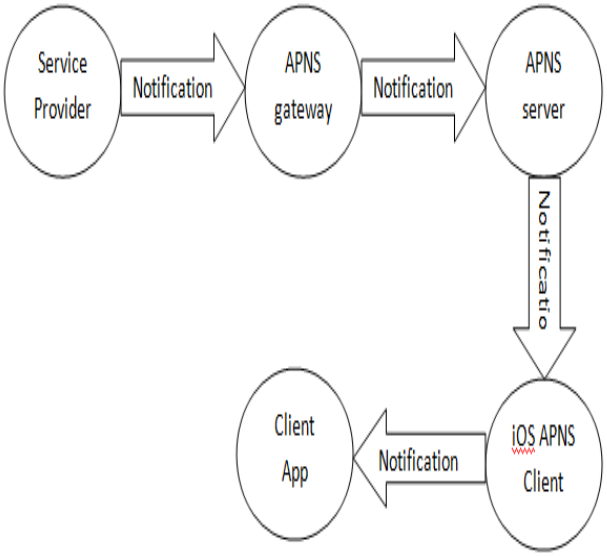

Fig. 1: APNS Messages Flow

Service provider generates a notification request and sends it to the APNS gateway. The APNS gateway receives the request and forwards it to the APNS sever. Since the APNS server has active sessions with the APNS shoppers**,** it will send its request to the iOS devices. Then iOS can wake up the specified application and the application can be active and process the request. Since there are air interface between the APNS server and the APNS clients, the message can dropped easily if the air condition is not good enough or if the device turned off.

B. GCM:

The device provides simple, lightweight mechanism that server can use to tell mobile application to contact the server directly, to fetched updated application or user data. The service handles all aspects of queuing of messages and delivery to the target application running on the target device. The free service has the ability to send a lightweight message informing the Android application of new data to be fetched from the server. Larger messages can be sent with up to 4Kb of payload data. Each notification messages size is restricted to 1024 bytes, and Google limits the quantity of messages a sender sends in mixture, and also the range of messages a sender sends to a particular device. Application on an android device doesn't need to be running to receive messages. The system will wake up the application via a mechanism called Intent Broadcast when the message arrives, as long as the application is setup with proper broadcast receiver and permissions. GCM doesn't give any intrinsic computer program or alternative handling for message information. Instead, it simply passes raw message data received straight to application, which has full control of how to handle it. Following diagram shows how Google cloud messaging works.

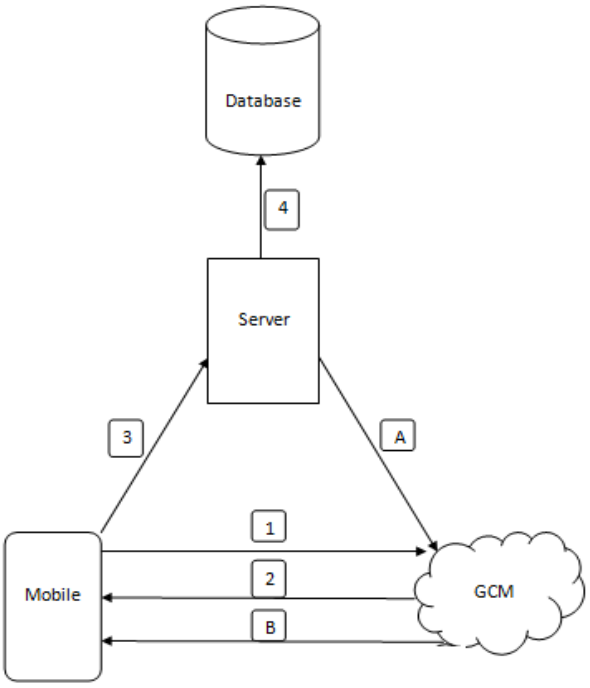

Fig. 2: Google Cloud Messaging

C. C2DM:

C2DM is a push notification service framework made by Google for Android mobile application. It is build in Android 2.2 (Froyo) or above. It can send messages to mobile application which is registered at Google play. For using the service the user should login to there android phones with their Google accounts. The Flow of the C2DM message is very similar with the flow of APNS message. Service provider generates a notification request and sends it to the C2DM gateway. The C2DM gateway request and forwards it to the C2DM server. Since the C2DM server has active sessions with the C2DM shoppers, it will send its request to humanoid device. Then android can wake up the specified application and the application can be active and process the request.

III. PROPOSED SYSTEM

We propose an android application for student alert notification which will cover all the limitations of existing systems. This project deals about an advanced hi-tech wireless notice board. We propose to develop an android application to solve problem related to normal notice board. It will provide all functionality like notification of all events which will be conducted in our college/institute. It may be related to training and placement, cultural events or may be related to any small activities in college. The project deals with two modules i.e. web application and android application. Web application is totally handled by administrator of that institute. Administrator can send notices, events notifications, culture and training placement related information through web application. Android Application is used by students. The notices send by administrator through web application is received through student's smartphones. This application also includes alarm system for important information. Android application is not only use by students but also by teachers of the information. Teachers can see their timetable in that application and also

post students unit test results, attendance and many more information through that application. Hi-tech wireless notice board application ensures that everyone has kind attention to every notice and updates going on in college. There will be a buzz at every and each notice to drive a attention of student to visualize it once. during this means students are well enlightened regarding their faculty activities.

We propose the following system architecture.

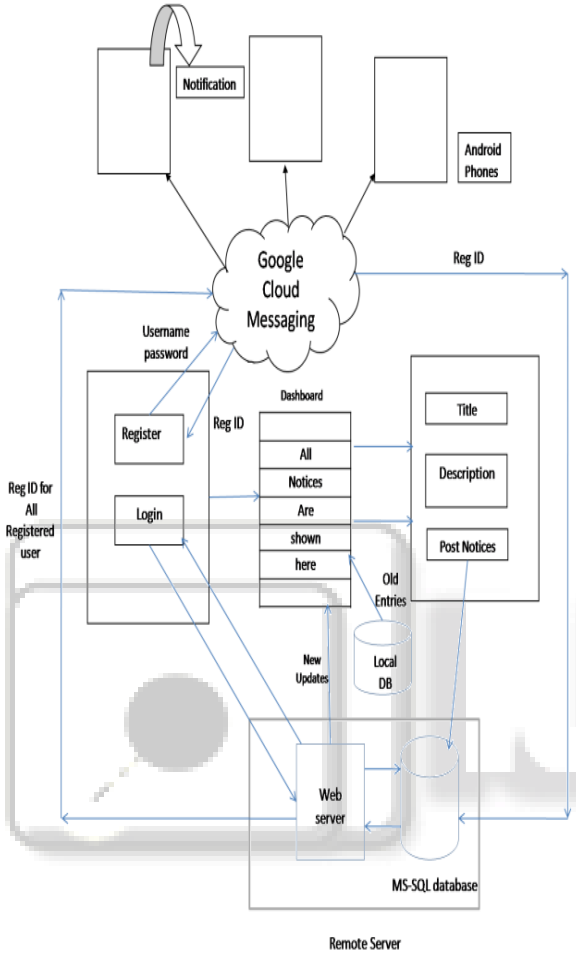

Fig. 3: Proposed System Architecture

IV. IMPLEMENTATION

A. *Android:*

World is contracting with the growth of mobile phones technology. As the number of user is the increasing day by day, facility are also increasing. Starting with simple regular handsets which were used just for making calls, mobiles have changed our lives and have become part of it. Now they are not just for making calls but they have innumerable uses and can be used as a camera, music player, tablet, PC, TV, web browsers etc. And with the new technology new software and operating system are required.

Android software system has developed a lost in last fifteen years. ranging from black and white phones to recent smartphones or mini computers, mobile OS has come back far-flung. Particularly from good phones, mobile OS has greatly evolved from Palm OS to Windows pocket laptop then to Blackberry OS and android

B. *Web Application:*

In the website designing, we designed the website for the user. User can access the application from the website and through phones. Figure 4 shows homepage that directs the users to navigate to various pages of website. It includes features like change password. Different pages are college admin, add college and post notice. Where college admin is responsible for adding more admin, adding college etc Figure 5 shows the post notice form which is for posting notices to various colleges regarding many fields for particular strings including its descriptions, locations and related images.

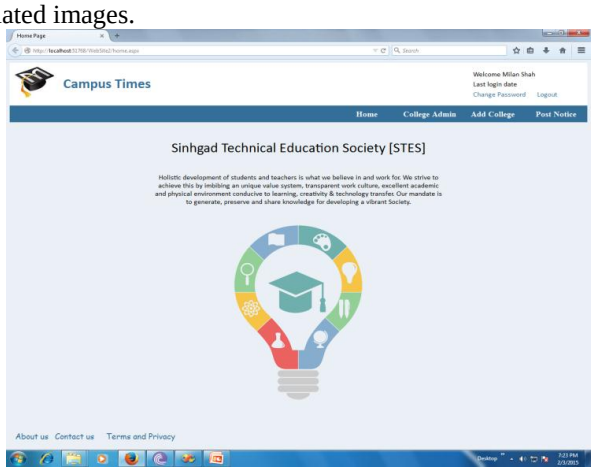

Fig. 4: Website Home page

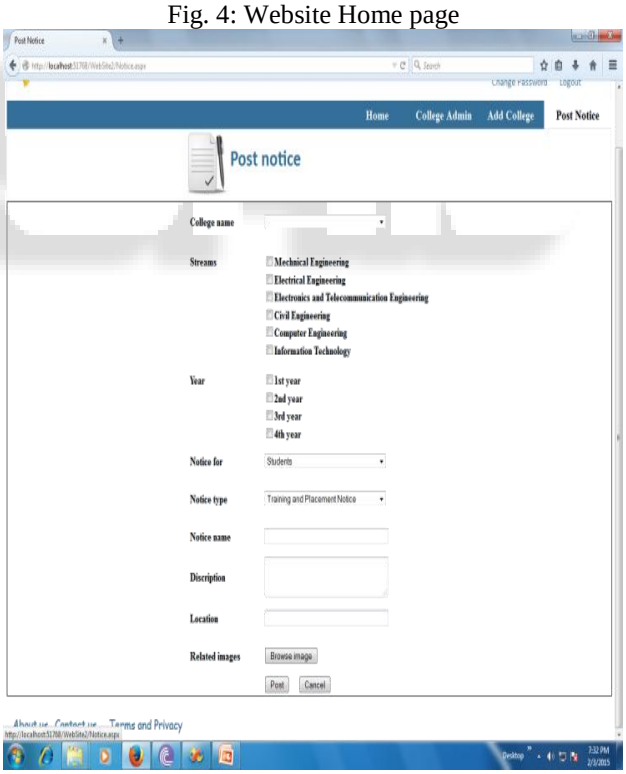

Fig. 5: Website Post notice page

C. *Android Application:*

Front-end of the system is an android application installed on the user android Smartphone. We are going to provide simple an interactive user interface. Figure 6 shows the Registration form whether user has to enter all the details that is username, college name, course name, year, division and contact details. The figure 7 and figure 8 shows the home screen that helps you to select which notices you want to view i.e. academic, Training and placement, Events,

Timetable, attendance. You can even edit your details whenever you want.

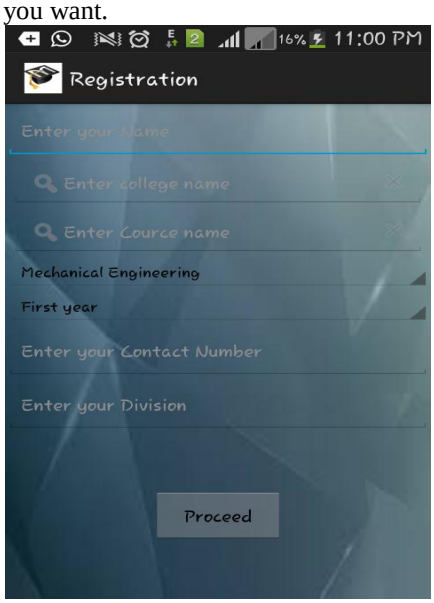

Fig. 6: Application Registration Form

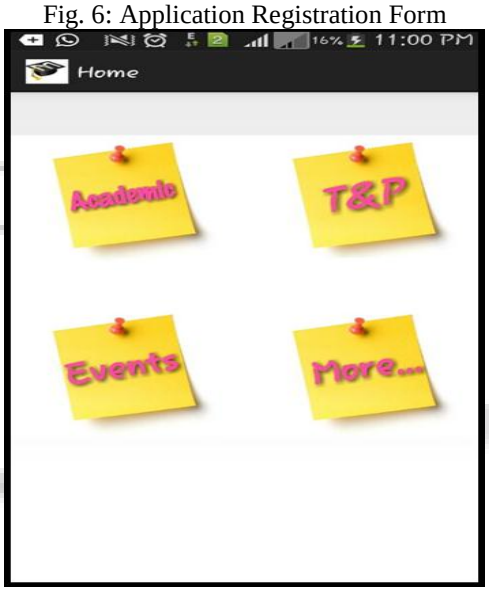

Fig. 7: Application Homepage

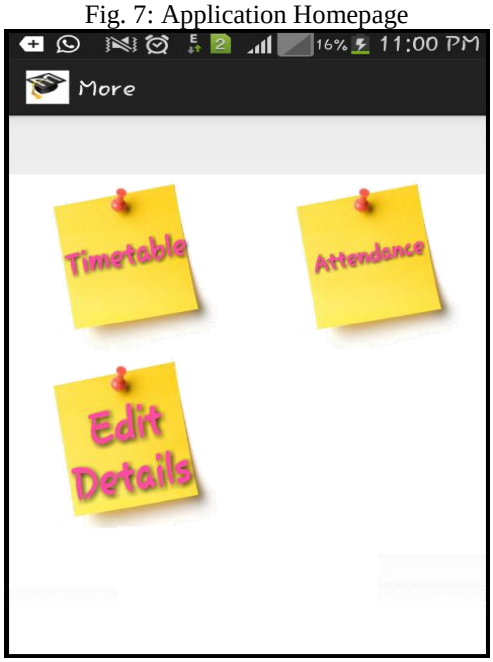

Fig. 8: Application More Tool

V. FUTURE WORK

The attachments can be further including improving PDF files or DOC files. Then there will not be much need to send images with the images with notices. A single file would serve all the purposes. Feedback on the notices can also be taken. It can increase communication among connected members and any issue easily sorted on the spot.

VI. CONCLUSION

In this paper we introduced a new system called student alert notification system which is use send notifications of college events, attendance, college notices etc. to students. We will develop this system by integrating Google cloud Messaging (GCM) and android's Push notifications. Our system will reduce the manual work. It has made notifying easy to everyone and that too with no time and place restrictions.

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