

# Automatic Wi-Fi based Student Push Notification in College Campus by using Cloud Computing

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**Abstract:** In Today's world, Communication is a very basic and essential need of our life and wire-less communication is the only in demand. In our colleges, university and even in hospitals there is a need of displaying notifications on notice boards regarding information about college events, result declaration, meetings or even some special announcements. But doing it day-to-day sometimes becomes hectic and also requires human presence at the spot for the same. To tackle the limitations of this technique, we have a technology called as push notification. It is actually a cloud based, push-styled, notification for mobiles. It uses push services which is provided by gcm as a medium for sending notifications to the pre-specified users and also displaying notifications on the users android based mobile devices.

**Keywords:** Android operating system, SDK tools, XAMPP, MySQL, PHP, GCM.

## I. INTRODUCTION

Push Notification is a technique of providing information to the user's device or the user's desktop in an efficient way. It is a format used to publish regularly updated notifications such as any events, announcements etc. It is a technology that can be used by student as well as teachers. Students can use this technology to stay updated with faculty announcements, regarding coursework and also other academic activities of the college. The exchange of information through Push Notification can take place from students to teachers, teachers to HOD, or from HOD to principal or also from students of various departments.

Faculty use PUSH NOTIFICATION to make any important or urgent announcements amongst teachers or students of specific department or all the departments. This technology has the capability to become the primary tool through which users interact with the Internet. It requires an Android application which has to be registered through GCM(Google Cloud Messaging)[1] using Google API console[5] which is a platform for PUSH NOTIFICATION [1] in web server which is written in PHP script[4]. In this server there will be a Database(written in MySQL) which stores the registration id and password of registered android users. If the users request for an information transfer, it will be first sent to GCM, and it will verify the registration id and password.

On successful verification, it will que the message and even if the targets mobile device is off, the data will be stored and the user will be later updated when connected to wifi or Internet. The main aim of this project is by organization provided wi-fi to receive notifications from cloud server.

## II. LITERATURE SURVEY

This project is based on the android application and its interface with server written in PHP language. But before

that we need to understand the basic tools required by the project. Such as,

1. Android Application : This is developed using android development studio along with SDK tools.
2. SDK tools : The Android SDK provides the tools and APIs which are necessary to begin developing applications on the Android platform using Java programming language. It compile the code along with any data and resource files.
3. .apk : All codes in a single '.apk' file is considered as one application and it is the file which is used by android devices to install the application.
4. Android OS : is a Linux-based operating system designed for touch screen mobile devices.
5. Android Emulator : It is a debug and test application virtual mobile device that runs on the computer to work in actual android environment. It actually checks how the application will run in actual android environment.
6. PHP: PHP stands for Hypertext Preprocessor. It is an open-source programming language used for developing server-side applications and various web contents.
7. GCM: Google Cloud Messaging is a free service provided by Google. It allows to send data from third party servers to their applications running on android devices. It also handles queuing of messages and delivery to the target application.
8. XAMPP: It is a free open source cross platform web server package consisting of Http server, MySQL database and interpreters for scripts written in PHP language.
9. MySQL: It is used one the server side. MySQL is the database system used along with php. It is an open source RDBMS which manages the data contained within the databases.

### III. NEED AND SCOPE OF THE PROJECT.

#### A. Existing Technique

In the present system there is no portable as well as quick notification system. Even on the notice boards, also in college websites, student sections are not updated regularly. Students have to look after notice board everytime and also there is a possibility of human error which might lead to change in actual data. The use of notice boards in schools or colleges leads to a number of problems such as:

- Missing Notices or important memos created for students.
- Wastage of time and energy to look for the notice boards in the college/university.
- Human Error in noting down any related updates.

All these problems can be solved in this project by PUSH NOTIFICATION. In this project we are providing the users accurate data in less time. As soon as the website will be updated the users should receive the important updates in real time.

#### B. Proposed Technique

In the proposed technique, we need a website which will update all the events, announcements, results, etc. then you just need to install the android app in your mobile. By installing the app in your mobile, the app will generate the PUSH NOTIFICATION in your mobile. All the above problems can be solved by using the PUSH NOTIFICATION. It takes the help of “Google’s Cloud to Device Messaging(C2DM)[8]” and “Google Cloud Messaging (GCM)” architecture.

The exchange of information which is generated by PUSH NOTIFICATION can also take place from students to faculty or among the students in various courses or from department to principal or also from students of various departments.

All you need to do is install this Android app in your mobile, register yourself and after verification of identity you will be able to receive the notifications if there is any. Only the people specified by the admin can receive the messages. For example there is two divisions of Computer branch namely as A & B. So the faculty can decide whether div A should get that message or div B should get that message or even both.

### IV. OVERVIEW AND ARCHITECTURE

Google Cloud Messaging (GCM) is a service which allows the user to send data from your server to the users' Android device. This can be a lightweight message which tells your app there is new data arrived which is to be fetched from the server.

The GCM service handles all aspects of storing, queuing and delivery of messages to the target Android application running on the target device. GCM is a totally a free service by google.

#### A. GCM Architecture

1. The Android app will send the senders id along with application ID to GCM server for registration.

2. Upon successful registration, the GCM server replies it with a registration ID to the android device.
3. After the device receives its registration ID, it will send it to the local server.
4. The local server will store the registration ID in its database for future use.
  - When a notification is provided by the website, the server sends the message to the GCM server along with the registered ID.
  - GCM server will deliver that message to respective device using that registration ID.

The GCM is the main fundamental of this project. It is a basic platform in data transfer. The user will first be registering on GCM platform[4] and also they will receive a token ID which will be stored on the server which identifies the user’s phone which is based on that ID. The server is the place where colleges will be having a PHP[5] based web client which will send the notifications to individuals with respect to their registration ID or also in bulk.

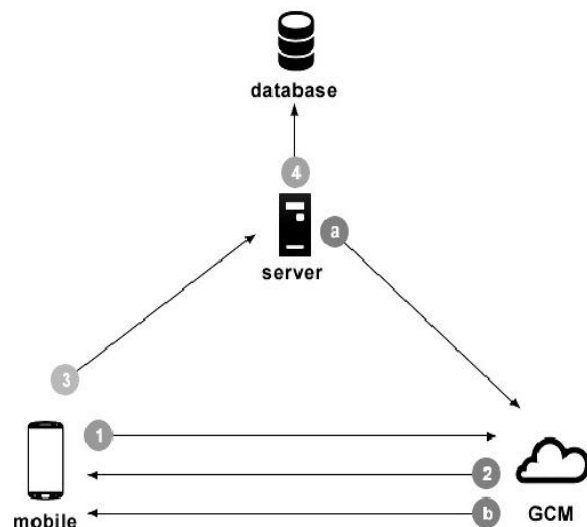


Fig 1. GCM Architecture and Workflow

This figure shows how the process of registration and sending a notification takes place which is as :

1. The GCM provides the registration ID.
- Step 2,3 and 4 : The mobile stores the ID on the server. Steps a and b are the phases where the server is sending the notification to the phone through the GCM architecture.

GCM is used as it is a client server architecture which is easy to implement. Besides this GCM also handles various aspects of messages like queuing, storing and also efficient delivery of messages. Using GCM we can send messages to a single or multiple android devices simultaneously just by a single transmission.

#### B. XAMPP

XAMPP is also a free, open source cross-platform [10] web server solution package, and it consists of apache http server, MySQL database and it interpreters for the scripts which is written in PHP language. It includes modules such as OpenSSL and php.

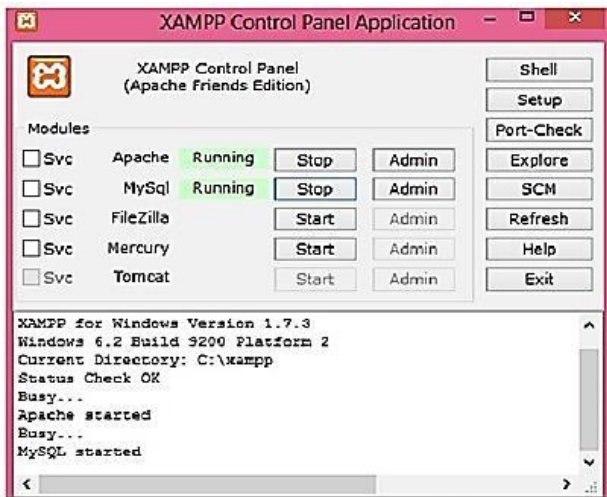


Fig.2 XAMPP Server

C. Google API

In this project, PHP is used as a server side programming language and MySQL is used as a server side database. We have also installed XAMPP server to install php, MySQL and apache. We also need to consider some prerequisites for developing the database and registering through gcm.

Registering with Google Cloud Messaging : Fig 3

1. Go to Google APIs Console page and create a new project. <https://code.google.com/apis/console/>
2. After creating project you can see the project id in the URL. Note down the project id which will be used as SENDER ID in android project

Enabling GCM service : Fig 4.

1. In the main Google APIs Console page, select Services.
2. Turn the Google Cloud Messaging toggle to ON.
3. In terms of service page agree the terms.

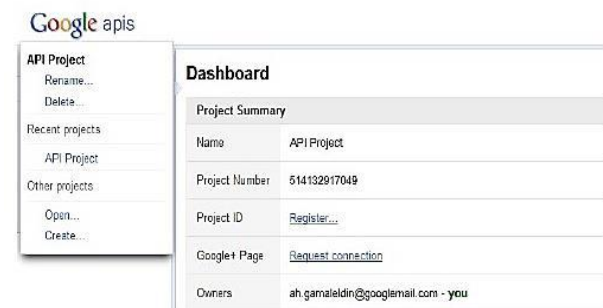


Fig.3 Google API's.

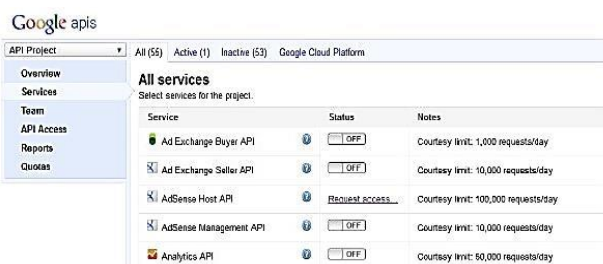


Fig.4 Enabling GCM services.

V. SYSTEM ARCHITECTURE

The system architecture consists of the conceptual design of the proposed system. It consists of the various components to be developed and the interfaces between each component.

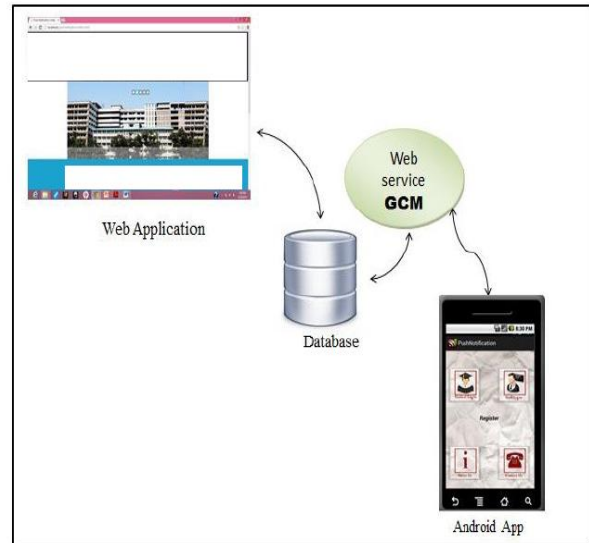


Fig.5 System Architecture

The System model consists of :

1. **Web Application :**  
The web application is created by using ASP.NET. It will be an interface via which the network administrator would be able to enter the information captured from various users. The information would be then stored on the central database.
2. **Database :**  
This component would host the database which would store information that would be captured from the users. The database would be hosted in a Microsoft SQL database and accessed by the android application.
3. **Android Application :**  
This would be an application that would access the database over the local host and retrieve summarized version of data captured on the database.

VI. FUNCTIONAL DESCRIPTION

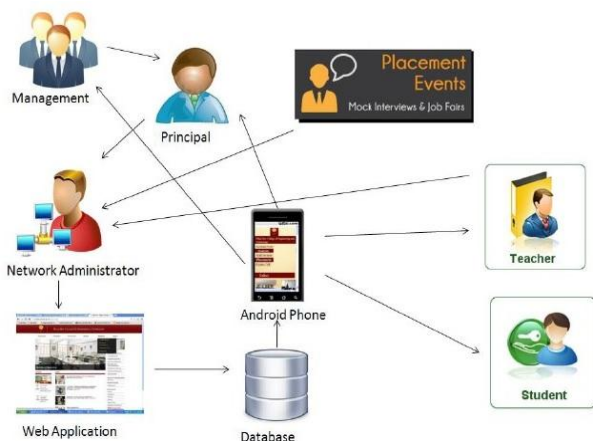


Fig 6. Functional Description

The exchange of information through PUSH NOTIFICATION facilitates from management to principal & from students to faculty in various courses within a department.

The functional description includes :

#### 1. Student Section:

This section of the college notifies the students about the latest updates and upcoming events. We also include Notice boards, Exam Cell Notice, Events and also Yearly Calendars in this section.

#### 2. Exam Cell :

It consists of the important notices for the students and updates for the faculty of Exam Cell. It include sub parts as Exam Announcements, Memos, Database and Notices.

#### 3. Staff Section :

It can be used by teachers to notify about the lectures and to make the staff update the student records. The consists of Time-Table, Lectures attended, assignments and also question banks for students to be uploaded at any time.

#### 4. Training and placement :

It can be used to notify students about the various campus placements, also the information about various eligibility criteria for different industries and also for the registration of students.

Step wise working of the Modules :

*Step 1:* Various users of the system like the faculty, placement cell, principal, exam cell will provide their important information or notices which has to be updated to the network administrator.

*Step 2:* Now the network administrator will capture the information and update that data to the web application.

*Step 3:* Now this updated content will be stored in a database of the system.

*Step 4:* Now the android app will fetch the data from the database and the notifications will be updated on the phone.

*Step 5:* The users will receive the feeds and store or analyze them.

Faculty use College Sync to help them efficiently use the Internet to exchange disciplinary information and increase awareness of important developments. This application contains content that is downloading real-time, based on inputs from the user or developer.

## VII. CONCLUSION

College procedures flips things around a little and it is a technology that provides you with a method of getting relevant and up to date information sent to you for you to read in your own time. It helps to saves you time and also helps you to get the information which you want quickly after it was published. It is just like subscribing to a magazine that is delivered to you periodically but instead of it coming in your physical mail box each month it is delivered to your „College premises in touch ANDROID App every time the college of your website updates. This App has the prospective to create a stronger connection between knowledge creations with individual learning.

## VIII. FUTURE SCOPE

This project can be implemented from intranet to internet environment. To make campus life easy, many useful functionalities can be added in future such as payment option i.e. payment of fees by mobile banking, which is a rapidly emerging technology than any other computing platform. We can also use the College Sync App to share and discuss the student's progress with their parent and can add the functionality of automated attendance system. Thus, this project has a huge scope to develop or add new functionalities as Android are a truly open source, free development platform.

## ACKNOWLEDGEMENT

GCM push notifications helps to save time and also to get the information which you want quickly after it got published. Along with this it provides the users to stay updated with information consistently via cloud by the help of synchronization process. By using the services which are provided by the Cloud, this technology can be applied to solve many obstacles which are faced by the institutions and organizations while giving out any updates by creating an efficient and reliable application on any mobile platform so that the end user remains updated on the latest news regarding their respective organizations.

## REFERENCES

- [1] Seth Y. Fiwoo and Robert Sowah of S.Y. Dept. of Computer. Engineering, University of Ghana "Design and development of an Android application to process and display summarized corporate data" in IEEE 4th international conference of Adaptive Science & Technology. Year:2012
- [2] Online Available: <http://developer.android.com/index.html>
- [3] Online Available: [www.androidhive.info/2012/android-push-notifications-using-cloud-messaging-gcm-php-and-mysql/](http://www.androidhive.info/2012/android-push-notifications-using-cloud-messaging-gcm-php-and-mysql/)
- [4] Online Available at: <http://developer.android.com/google/gcm/>
- [5] Online Available: <http://www.php.net/manual/>
- [7] Online Available: <https://code.google.com/apis/console>
- [8] Online Available: <http://www.mysql.com/>
- [9] Online Available at: [http://tutorialspoint.com/android/android\\_architecture.html](http://tutorialspoint.com/android/android_architecture.html)
- [10] Online Available: <http://en.wikipedia.org/wiki/XAMPP>

## BIOGRAPHIES

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