

Development of an Institutional App by adopting Android Play

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ABSTRACT

The whole information of any organization or an institution has to view in a hard file, or in website in the current circumstances. At the same time while searching any information it is very hard to access and takes a lot of time to search the particular website. Because of this, in order to overcome this problem a smart phone based application using Android can be used to make this process easier, secure and less error prone. The Android application is portable and can be easily installed and used on any mobile phones supporting Android OS. It also provides an interface which is easy to understand by the users and greatly helps in adapting to the use of this application.

Android is an open source Linux based system developed by Google, and mostly aimed at mobile handsets and other portable devices. In short, we will be using them to complete our daily job. One computer program that falls into this category is the Android Application for College. This College application provides a wide range of useful information which split into several abilities to do things. These include: academics, news, events, facilities, and all the college details. Users can install this application in their android mobile to view all of these college details and make use of it.

Android application for college provides one attractive environment where you can manipulate information about college easily. Through this the students, Faculty members get all the information in their hand. It is software which is helpful for students as well as the college authorities. The main principle behind the need of Android app for college is easy supervision of the Institute.

This software can help us to explore all the activities happening inside the college. The courses offered in the college, the latest news and updates that will be updated in the college website in timely wise manner, the various events took place in our college along with their details, pictures etc..

Our application also provides details of various NSS activities conducted in our college such as Blood donation, various social awareness camps. One of the most interesting features of our application is "The Digital Attendance Management System". The digital attendance management system provides flexibility to the faculty to take attendance of the students directly in the application.

KEYWORDS: Android Application, College website, Digital Attendance management system

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I. INTRODUCTION

The time in history of mobile technology opens the windows to the android computer program. The websites are disappearing and the mobile phones

are newly appearing. It's the time to change from ordinary websites to apps, which has become the part of our daily commonly done actions. We are introducing the android application software which would be a miniature of our college website

(Brindavan Institute of Technology & Science). It works not only as a website, but also it can work as small college management software. Project gives a total solution to everyone.

The application becomes also a Mobile version of our official website. It gives us more comfort and a better user interface. It acts as an overview about the campus to a guest like

- They can view the about of college.
- Can know details about various departments, workshops, faculties, library etc
- The guests can view major events conducted in the college

Parents can view the monthly attendance of their ward directly in the guest mode without any logging in. It acts as a college assistant for authorized users.

Students can create their individual accounts by providing their personal details in the registration form and get access view the college content and also their respective department details, latest news updates related to work via notifications. The application also provides flexibility to the students to view their monthly attendance directly in the Smart Phone itself. The Faculty members can take hourly attendance of respective branches of Students directly in the Application itself. A report card of attendance is generated and faculty members can view the generated report card of attendance.

II. EXISTING SYSTEM

In the existing system, all the information does have to maintain in a hard file, or in website. While searching any information it is very hard to access and takes lot of time. Viewing the website in the Smartphone some time may be inconvenient to the user (especially the Unresponsive websites). The readability of webpage decreases The user require to zoom over the website to view the specific content. Thus it may consume more time for the user.

The figure below specifies the flow of existing system in which the users request for viewing college website is send as SQL query calls to the college database. The data is present in the form of files. The desired data is send to college website from there it is displayed to user as a form of output.

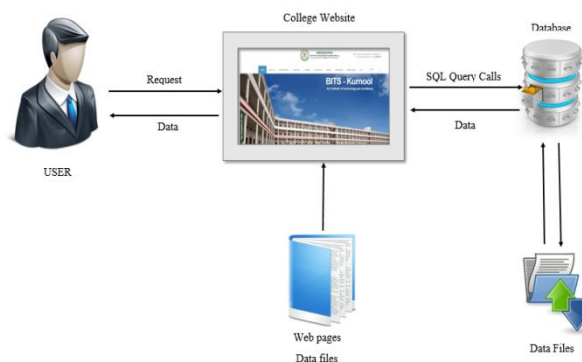


Fig: 2.1 Existing System Flow Diagram

Disadvantages

- It takes a lot of time to the user in order to open the website and view the desired details.
- When the user access website in Smartphone, It is very difficult to search for any particular in the website.

III. PROPOSED SYSTEM

The proposed system software would be a miniature of our college website. The information and notification can be easily accessed by one touch on the android application. The application provides a live notification for the students as well as other people who set the notification ON. The proposed system is an application that is designed to manage and handle the operation of an institution. It is a handy application that can be used by the all users to facilitate communication. The application introduces portability as it is used on a mobile device and can be carried anywhere. Since the application is used on a mobile device with Android OS, it improves connectivity between the all users, thus helping the institution to provide a more transparent system altogether. It is a useful tool that can be used by all the members from anywhere, at anytime on an Android mobile device. In this it has some of the features, followed as below as

- **Notifications:** -
 - Alerts are to be send to all the students in the college.
- **Activities Information:** -
 - Students can view details of schedules for various events. This will help students.
 - keep better track of extracurricular activities and events.

College Details:-

- People can view details of college like infrastructure, facilities, faculty information, gallery, placements, etc...

NSS (National Service Scheme) Related Information:-

People can get blood group details which are available in emergency cases

Digital Attendance Management System:-

The Faculty members can login in the application and do their respective works such as they can take the hourly attendance of students of respective branches directly in the application itself. After taking the attendance they can view report card of marked attendance. The attendance is automatically stored in the server. Thus the digital attendance management system is advancement to the existing attendance system. This eradicates the paper work and eases the work.

Architecture

The architecture represents the overview of our proposed system. The architecture mainly contains 4 phases listed below.

1. Android Application
2. Web services
3. JSON
4. Database

The Android application provides the user friendly interface so that the user interacts with the android application easily. The user interacts with android application and sends his/her desired request

The Android application forwards the request to the web services. The web services are basically software that can be written in any language such as Servlets, JSP, ASP, PHP. Here we are using PHP. They provide the necessary services across all over the network. Then the request is either transferred to JSON or the database.

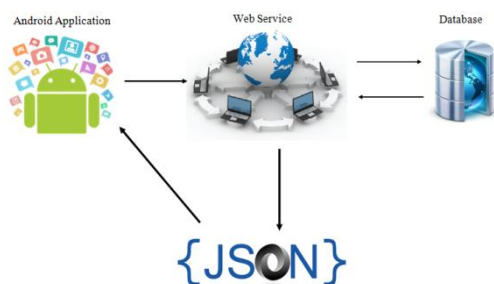


Fig: 3.1 Architecture of our System

The JSON parses the necessary information and sends back response to the application. There may be some requests which do not require the access of database like the retrieval of notification updates such requests are directly forwarded to JSON and finally response is send to application. The requests which need to access the data base are forwarded to database from web services. The information is retrieved from the database and then the request is forwarded to JSON and then the response is send to back to user through application.

IV. REQUIREMENT SPECIFICATIONS

The requirements can be classified mainly into two categories namely

1. Hardware requirements
2. Software requirements

Hardware requirements

The requirements of system configuration in order to develop the android application using Android Studio are specified below

Requirements for version 2X

- **RAM:** 3GB minimum, 8GB recommended
- **Processor:** 64-bit operating system and Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64)
- **Disk Space:** 500MB disk space for Android Studio, at least 1.5 for Android SDK, emulator system images, and caches
- **Screen Resolution:** 1280x800 minimum screen resolution

Software Requirements

- **Android Studio:** It is used to develop Android Applications
- **JSON Format:** It is the most common data format used for asynchronous browser/server communication, largely replacing XML, and is used by AJAX.
- **SQLite Database:** Used as local database.
- **MySQL Database:** Used as server database.
- **Languages Used:** Java, XML, PHP
- **Required OS:** Windows/Mac OS/Linux
- **Required Java Version:** Java Development Kit (JDK) 7 or higher.

V. TECHNOLOGIES USED

5.1 Android Studio

Android Studio is the official integrated development environment (IDE) for the Android

platform. It was announced on May 16, 2013 at the Google I/O conference. Android Studio is freely available under the Apache License 2.0. Android Studio was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0.

Based on JetBrains' IntelliJ IDEA software, Android Studio is designed specifically for Android development. It is available for download on Windows, Mac OS and Linux, and replaced Eclipse Android Development Tools (ADT) as Google's primary IDE for native Android application development.

New features are expected to be rolled out with each release of Android Studio. The following features are provided in the current stable version.

5.2 JSON Format

In computing, **JSON** (canonically pronounced /'dʒeɪsən/ *JAY-sən* sometimes **JavaScript Object Notation**) is an open-standard format that uses human-readable text to transmit data objects consisting of attribute-value pairs. It is the most common data format used for asynchronous browser/server communication, largely replacing XML, and is used by AJAX.

JSON is a language-independent data format. It derives from JavaScript, but as of 2017 many programming languages include code to generate and parse JSON-format data. The official Internet media type for JSON is application/json. JSON filenames use the extension .json.

Douglas Crockford originally specified the JSON format in the early 2000s two competing standards, RFC 7159 and ECMA-404, defined it in 2013. The ECMA standard describes only the allowed syntax, whereas the RFC covers some security and interoperability considerations.

RFC 7493 defines a restricted profile of JSON, known as I-JSON (short for "Internet JSON"), which seeks to overcome some of the interoperability problems with JSON. Every I-JSON document is a valid JSON document but not every valid JSON document is a valid I-JSON document.

5.3 SQLite Database

SQLite (/ˌɛskjuːəl'laɪt/ or /'siːkwəl.laɪt/) is a relational database management system contained in a C programming library. In contrast to many other database management systems, SQLite is not a client-server database engine. Rather, it is embedded into the end program.

SQLite is ACID-compliant and implements most of the SQL standard, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity.

SQLite is a popular choice as embedded database software for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems (such as mobile phones), among others. SQLite has bindings to many programming languages.

Android provides several ways to store user and app data. SQLite is one way of storing user data. SQLite is a very light weight database which comes with Android OS.

5.4 MySQL Database

MySQL (officially pronounced as /maɪ ɛskjuːəl/ "My S-Q-L") is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius' daughter, and "SQL", the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

MySQL is a central component of the LAMP open-source web application software stack (and other "AMP" stacks). LAMP is an acronym for "Linux, Apache, MySQL, and Perl/PHP/Python".

Languages Used

- Java
- XML
- PHP

VI. USER INTERFACE DESIGN

The User Interface of our application is consisting of various fragments such as registration of Students, Faculty & various features.

6.1 Registration

Registration gives you a fixed identity. On creating an account, you can pick a user name provided it is available and unique. Edits you make while logged in will be assigned to that name, not to your IP address. You will have your own permanent user page where you can write a bit about yourself. Having an account gives you a fixed identity that other users will recognize. If you choose to give an e-mail address, other users will be able to contact you by e-mail. Sometimes new or unregistered users are prevented from editing pages that are common targets of vandalism.

6.2 Login

In computer security, logging in, (or logging on or signing in or signing on), is the process by which an individual gains access to a computer system by identifying and authenticating themselves. The user credentials are typically some form of "username" and a matching "password", and there credentials themselves are sometimes referred to as a login, (or a login or a sign in or a sign on). In practice, modern secure systems also often require a second factor for extra security. In this App we are providing login facility for Students and Faculty

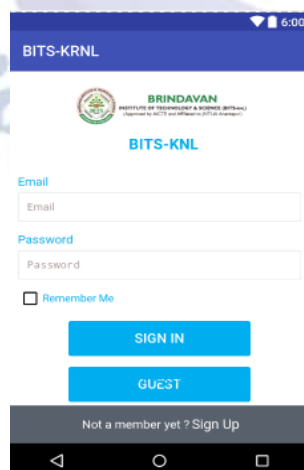


Fig: 6.1 Login Page

Student Login:

- Student will login with his/her particular email id & password

- After logging in, a student can view the detail of college, notifications, gallery, blood groups etc...

Faculty Login

- Faculty will log in with his/her email id & password.
- After logging in, he/she can view the same details as of a student.

Guests

The guest does not need any authentication details. They can directly view the *home page* content in the application as shown in the figure.



Fig: 6.2 Home Page

VII. FEATURE IMPLEMENTATION

In this we are going to explain how the features implemented, which are mentioned. There are some of the features followed as below

- Information Retrieval
- Mobi Bulletin
- Digital Attendance Management System
- Other Features

These features implementation given as below

7.1 Information Retrieval

In our application we are maintaining both static data and dynamic data. The static is about the college details which can not changed such as location, address, etc..

And static data is stored in app itself it doesn't need server. When a person want to know he can just download the app and can view the details.

And in this context there is no any server work to do. This data can retrieve by clicking the options (Buttons) which are available for static information.

Coming to the dynamic data, this data can retrieved with the help of server only. To view this data our phone or app should be connected with internet, otherwise the information cannot be displayed. In this dynamic data we consists information about notifications, blood groups etc...

In this dynamic data retrieval first a person need to register into application and this registration can only available for a people who belongs to college such as students, faculty. In this the options are given according to the role of a person, if a person is a student he can only get the information regarding the college like events, holidays, recruitment drives, etc... , otherwise the person is a faculty then he will get notifications as same as students

Finally a person can retrieve data by sending a request (By clicking buttons which are used for dynamic data retrieval) to the server, and the server responds by collecting required data from the database and it can be transmitted using the JSON which is responsible for parsing data to the application.

7.2 Mobi Bulletin

It is the one of important and interesting feature of our Institutional application. It is useful to get the information about the updates in college. And these notifications can be viewed by the people who are registered with this application who are like students and faculty. And admin is the only person who is responsible for maintaining or updating the notifications regarding the college. And these updates can receive only when our application/phone connected with internet.

When updating the notifications the admin directly put them into server and when a person opens the application with internet automatically he gets the notifications regarding the college or by refreshing the application also he can able to view the updates.

In this we get the notification regarding the things which are followed as below

1. Exam Time Tables
2. Events Organized
3. Holiday Notification

4. Recruitment Drives Info, etc....

There are some of the features are followed as below

- Staff or student can be noticed of new postings via notification alert.
- Notice administrator may push important notices in to selected staff's email.
- Notice administrator may create any notice category.

This feature can able to do some of things which are followed as below as

- **To eliminate wastage of time and energy**

Mobi Bulletin will be able to save lot of paper and time. It directs both teacher and pupil's energy and attention to one thing at a time by placing proper persons at their proper places at the proper time. Everything will be instantaneous.

- **To avoid duplication and overlapping**

This application will help to remove the duplicity of notices. Only one person, who is admin can post the notice. No one else would be able to do so. So student and staff will be given correct information all the time.

- **To ensure due attention of student to each and every notice**

Mobi Bulletin ensures that everyone has kind attention to every notice and updates going on in college. There will be a buzz at each and every notice to drive the attention of student to check it once. In this way, students will be well informed about their college activities.

- **To bring system into college life**

It would be dire need of all colleges as it's easy and shortcut method to inform all the students. The absence of proper notification system will make it difficult to inform students at right time.

- **Free Service**

It gives free service to notify all the students. There will be no cost of sending notification to all. Just have the good system implemented in college and that too free of cost.

- **Prevent Crowd in College**

As you can see, there is always a crowd at notice board. As notice board is one, and people to see notice are more. With this application there will be no more crowds. Everyone will be well informed even at their homes. So they are free to do there other work.

- **Anytime Anywhere Service**

With this application, notices will be delivered anytime and at any place. There is no restriction of time to send a notice.

- **Automatically Updated Notifications**

The notifications automatically updated when a new message arrives. The user can himself refresh the dashboard to see any new notice.

7.3 Digitalized Attendance System

It is the one of important and interesting feature of our Institutional application. It is useful to take attendance using the mobile phone with the help of an application. And this will be under control of faculty. Faculty can take the attendance by logging into his account and by selecting Attendance option.

To take attendance the faculty should have to specify the year, branch, subjects which are taken by him/her at the time of registration only. By selecting the attendance option he can choose the things like branch and batch he get the list of students names and then he/she can take the attendance. The taken attendance will be in the form a report in option called "Attendance Report".

The student can view his attendance. And these taken attendance reports are stored at server. And every faculty will have his attendance report regarding the particular subject which he/she dealing.

For manual attendance system, the most common problem is the faculty need to take student daily attendance and manually filled the record in attendance book for every month. If the attendance book is missing or misplace, it could lead to big problem because the faculty need the attendance record to make analysis and generate an attendance report. Another problem is the faculty will need more time to analyze and generate the attendance report because the faculty needs to search and refer the old attendance record first.

The problems which are facing by manual system are overcome by this feature.

7.4 Other Features

In this there are some other features are followed as below

1. Gallery
2. College Location
3. NSS Activities etc....

7.4.1 Gallery

In this it consists of two types of pictures

1. Event Gallery
2. Media Gallery

In event gallery we will maintain the all the pictures which are taken on any occasion or an event organized in the college.

In Media Gallery we will maintain the all the pictures which are published on the news papers about a particular event.

7.4.2 College Location

In this we will maintain a GPS Location oriented picture of our college. By this the people can easily identify where the college is placed.

7.4.3 NSS Activities

In this we are maintaining the blood groups of students and faculty. These will help in the situations like emergency need of blood. And this is viewed by the outside people who are not belongs to college.

For security reasons or any privacy reasons we are only displaying the blood groups of gents with their phone numbers to the students and as well as users who are not belongs to the college. The both gender blood group is visible to faculty only.

Who wants the blood they can directly contact by phone number which is provided by students at the time registration.

VIII. FUTURE ENHANCEMENT

As a future work various additional features that can be implemented in our application are discussed below.

- To Provide the permissions for Faculty members to update about various activities in the application such as
 - Upload the photos of latest events, activities etc. to the Gallery.
 - Share the attendance of students directly to the HOD.
- The chat option between the faculty and students can make easier to discuss about works.

- The file sharing system between the students and faculty members.

IX. CONCLUSION

Android application for college through mobile devices is a very effective tool which can be used to a great extent. The application is portable and can be easily installed and used on any mobile phones supporting Android OS. The use of this application in a mobile can result in a reduction of number of hours spent than in PC. It also provides an interface which is easy to understand by the users and greatly helps in adapting to the use of this application. An Android based mobile application for college offers reliability, time savings and easy control. Not only the institution members, but also the other users can also view the college details through this application.

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