

Cloud based Intra-College Communication Information System using Mobile Clients

Swapnil S. Bangare, Atul S. Mhaske, Sagar A. Sune, Harshal D. Pranjale

Abstract— we have seen over the years that the process of notice boards, important notification about academics has been carried out manually almost across all educational institutions. The process is not only time consuming but also inefficient. This traditional system requires a manual work of writing notifications, taking printouts, displaying it on notice boards and also requires students to watch periodically. It uses a lot of paper work. Today, we need not to maintain paper based Notice boards. Following this thought, we have developed a system based on the concept of web services which is implemented on Android mobile application as well as on PC that communicates with the database residing on a remote server. This paper focuses on how the students are able to get notifications right onto their mobile application. In this paper the author's show that how the concept of web services will be useful for communication between remote server and Android mobile application. This paper discusses the proposed system, overview of the design, and its implementation.

Index Terms—database, mobile application, remote server

I. INTRODUCTION

The concept of Web Services is not new and has been around for many years now. For a person who is unaware, a better way to understand it would be to consider the example of a user who might be interested in locating a public web service that gives the weather forecast in cities. Upon invocation, the web service will respond by giving information about which services are provided by which servers. Hence, now the user knows the location of the web service but doesn't know how to invoke it. For this purpose, the web service needs to describe itself (tell us how the user should invoke it).

The basic idea of a web service invocation involves sending of messages between a client and a server. For example, SOAP (Simple Object Access Protocol) specifies the format in which the requests are sent to the server and how the server should format the responses. One of the most common methods to access remote database is by using the concept of web services. Web Services are platform independent and language independent since they use standard XML languages. Moreover, majority of the web services use Hypertext Transport Protocol (HTTP) for transmitting the messages. One of the most interesting

Features of a web services are that they are self-describing. This means that once a web service is located we can ask it to describe itself and tell what operations it supports and how to invoke it. This is handled by the Web Service Description Language (WSDL) [1].

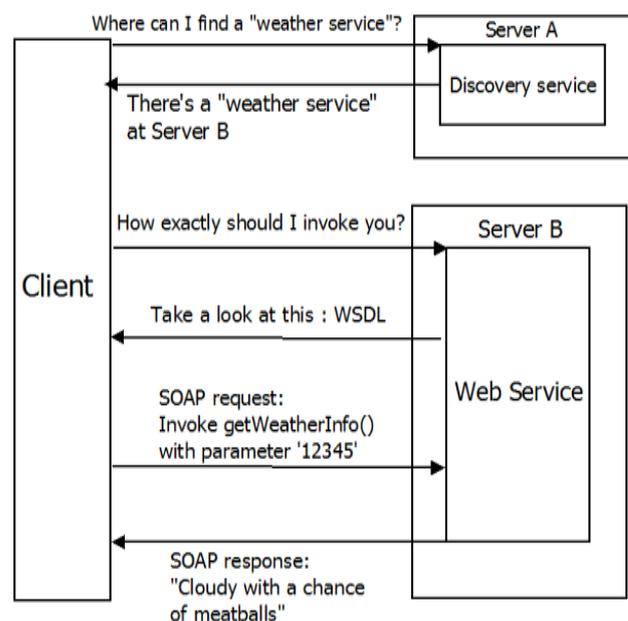


Figure 1: Web Service Discovery and Invocation

This system is intended for communication purpose between users of academic institutions. This system helps the administrator to easy access the information of students. This system is also helpful for the administrator because he/she can easily bring changes to the records of the students.

The mobile application would require connecting to the database on a remote server using Wi-Fi technology. Our system primarily focuses on building an efficient and user friendly Android mobile application for a Cloud based Intra-College Communication Information System using Mobile Clients. The application will be installed on the users (student/teachers) Smartphone. Apart from that, the application supports strong user authentication and quick transmission of data via the web service. Another noticeable feature of the entire application would be that no data would be stored on the user device in any form whatsoever.

A. User Interfaces

Each level of user will have its own interface and privilege to manage information. For e.g. supervisor will be able to

monitor/manage students progress and make comment on it, student can change his detail, view the progress. The System also provides a feedback form for all users to give comments or ask questions. It provides a FAQ to minimize the workload of system administrator.

B. Communications interfaces

The SOAP and XML will be used to facilitate communications between the client and server.

C. Administrator role

Administrator can also individually address each user with task assignments, submissions, etc. This will save a lot of time usually required to meet and address individual students. Administrator must be able to add groups, authorize users, etc.

D. Users and Characteristics

The users of the system are students, teachers and the administrators who maintain the system. The users are assumed to have basic knowledge of the computers and Internet browsing. The administrators of the system to have more knowledge of the internals of the system and is able to rectify the small problems that may arise due to disk crashes, power failures and other catastrophe to maintain the system. The proper user interface, user manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.

II. SYSTEMS IN USE

A. Existing System

In any educational system, notices, important notifications, information about any event etc. are displayed on the notice board. In this manual system student didn't get vital information about their academics or any updates about notifications regarding events on timely manner. The sizes of notice boards are small due to this only important notifications are placed there. The notice boards are distributed among different departments of college therefore it is not possible for student to visit each department for getting updated information about their notifications, events.

B. Proposed System

Our system includes maintaining a *private cloud* in the college premises. This cloud is installed on the local server (may be a computer). The cloud will host web services (such as view notifications, broadcast message etc.). All the data related to students is stored on the MySQL database. The mobile application would require connecting to the remote server using Wi-Fi technology. The users of this system are teachers and students. Teachers act as an administrator who can post important notifications, messages, notes or any other information regarding academics from their PCs or android app. Students can get this information instantly on their android app. So, with the help of this system students can get vital information regarding their academics as well as updates about it on time.

III. AIMS & OBJECTIVES

- User must be able to maintain his schedule, notes, to do's, reminders, etc. online using the web service.
- User must be able to create and manage personal problems.
- User must be able to send mails using this system.
- User must be able to join a particular group or leave it at will.
- User must be able to send SMS messages to other users.
- Administrator can also individually address each user with task assignments, submissions, etc. This will save a lot of time usually required to meet and address individual students.
- Administrator must be able to add groups, authorize users, etc.

IV. MODULAR APPROACH

Our proposed system is divided into four distinct modules described as follows:

A. Admin

Administrator plays the main role in this system. When admin interacts with the system he/she will be provided with the form which contains option for adding new staff member and updating details of existing staff members.

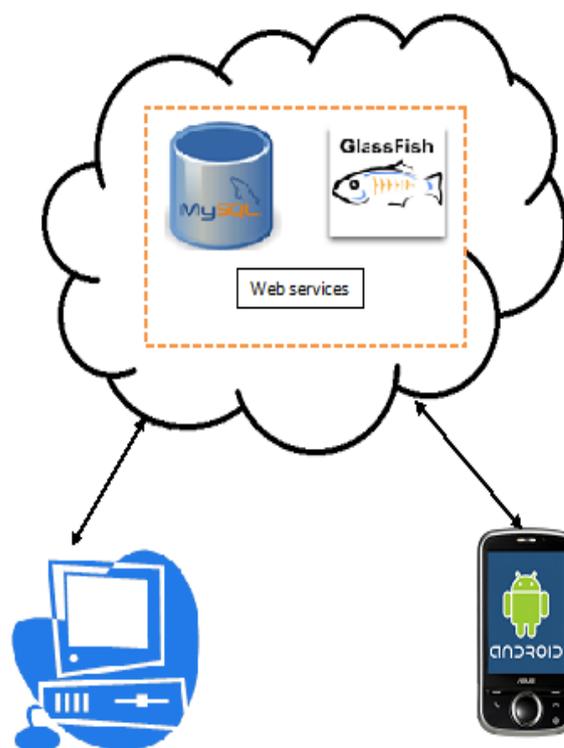


Figure 2 : Architecture

B. Staff

Initially, when the teacher runs the application for the first time, a login screen will be displayed that will prompt the teacher to enter the username and password required for

authentication. The teacher will be provided with a unique username which would be a combination of alphanumeric characters. Only when the teacher enters the correct username and password, a “success” message will be displayed and the teacher will get authenticated and directed to the next screen.

The next screen contains various options such as manage notifications, add notifications, add student, message broadcast, SMS broadcast, email broadcast etc. Teacher will need to select any option such as add notification. After doing so, the teacher needs to call the web service by clicking a button provided on the screen. The web service thus invoked would send the notifications to the student in the group belonging to a particular semester and branch as per the input provided.

C. Intracollege server

All the web services is hosted on this server. Teachers and students will require connecting to this server for further functionality.

D. Android App

Students will have this application installed on their android phone. Each student will have a unique username and password, which will be provided to them by their teachers. Only teachers will be able to add new student or remove existing student, student do not have such privileges They must be able to view notifications, create and manage personal problems, send SMS messages to other users.

V. ALGORITHMS USED

A. Secure Hash Algorithm

SHA-1 is the most widely used of the existing SHA hash functions, and is employed in several widely used applications and protocols. When a message of any length < 264 bits is input, the SHA-1 produces a 160-bit output called a message digest. The message digest can then be input to the Digital Signature Algorithm (DSA) which generates or verifies the signature for the message. Signing the message digest rather than the message often improves the efficiency of the process because the message digest is usually much smaller in size than the message. The same hash algorithm must be used by the verifier of a digital signature as was used by the creator of the digital signature. The SHA-1 is called secure because it is computationally infeasible to find a message which corresponds to a given message digest, or to find two different messages which produce the same message digest. Any change to a message in transit will, with very high probability, result in a different message digest, and the signature will fail to verify.

B. Searching Algorithms:

At the heart of almost every modern system is a string matching algorithm. String matching algorithm is crucial because it allows find the information base on their actions on the content that is actually flowing to a machine.

VI. CONCLUSION

Our system primarily focuses on building an efficient and user friendly communication system for the educational institutions. The application will be installed on the users (in this case teachers) Smartphone. Apart from that, the application would support strong user authentication and quick transmission of data via the web service. Another noticeable feature of the entire application would be that no data would be stored on the user device in any form whatsoever.

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Authors



Swapnil S. Bangare

Pursuing B.E. (Computer Engineering)
University of Pune
Department of Computer Engineering,
Government College of Engineering and Research Avasari
(Khurd), Taluka- Ambegaon, Dist- Pune



Atul S. Mhaske

Pursuing B.E. (Computer Engineering)
University of Pune
Department of Computer Engineering,
Government College of Engineering and Research Avasari
(Khurd), Taluka- Ambegaon, Dist- Pune



Sagar A. Sune

Pursuing B.E. (Computer Engineering)
University of Pune
Department of Computer Engineering,
Government College of Engineering and Research Avasari
(Khurd), Taluka- Ambegaon, Dist- Pune



Harshal D. Pranjale

Pursuing B.E. (Computer Engineering)
University of Pune
Department of Computer Engineering,
Government College of Engineering and Research Avasari
(Khurd), Taluka- Ambegaon, Dist- Pune