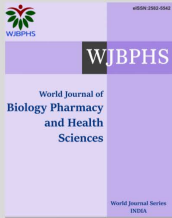




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(RESEARCH ARTICLE)



DESIGN AND IMPLEMENTATION OF AN ONLINE CAMPUS ALERT SYSTEM FOR ENHANCED UNIVERSITY COMMUNICATION

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ABSTRACT

Online Campus Alert System is a web-based emergency notification system that enables college and university administrators to send emergency alerts from one easy-to-use interface. This system enables communication with the entire campus community in minutes via the communication channels most popular with students, specifically SMS text messaging and Email. From any location, administrators can deploy concise, time-sensitive messaging that helps contain rumors, restore and manage campus safety, and keep the community informed with pertinent information. With more than 90% of college students possessing cell phones, this system serves as a quick and reliable emergency notification method that delivers messages whether students are in class, eating in the student union, relaxing in the dorms, or in transit. This research introduces a detailed architectural approach to sharing information between students, lecturers, and the administration to enhance the quality of information in the campus environment. By developing a comprehensive online application supported by a MySQL database and PHP processing, a collaborative communication system is provided within the campus. This creates a ubiquitous environment throughout the campus, making it a highly positive and informative tool. The system promotes the high usage of mobile phones by students, allowing them to learn, solve queries, and receive the latest campus news directly on their mobile devices.

Keywords: Campus Alert System; Emergency Notification; SMS Messaging; Mobile Computing; University Communication; Database Architecture.

1 INTRODUCTION

With the advent of mobile network communication systems, users have been offered multiple services such as the ability to send multimedia messages like SMS, Video, Data files, and Images. This paper describes the comprehensive design and implementation of a Campus Alert System that conveniently provides information to students with the use of Email and SMS technology via their mobile phones and devices. Mobile phones and devices are necessary assets, most especially to students, as they make communication and the spread of information significantly easier. The implemented system allows registered students to access information provided they are available in the system's database.

We are living in the era of the information revolution, with devices such as computers and mobile phones sprouting everywhere, thereby making it easy for information to be communicated. The education sector is not left out in this growing development. The availability of such communication mediums in any institution makes it possible for information to be passed on to students as soon as they are available. The major advantage this system offers is that students can receive valuable information on the fly, easily and conveniently. SMS and email play a major role in the implementation of this system due to their usefulness in conveying information from one place to another in a very fast and easy way.

An alert is defined as a machine-to-person communication that is important or time sensitive. An alert contains user-requested content such as a reminder, a notification, or an urgent warning. Campus-wide alerts, breaking news, and weather information can be passed to users through the university's Campus Alert System, which utilizes text messaging and email capabilities to communicate with computers, tablets, cell phones, wired phones, and social media in the most convenient format for the recipient.

Statement of Problem and Objectives

Up till today, there exists the problem of searching the physical notice or information board for the latest information. Many problems are encountered with this manual method of disseminating information. It is quite unfortunate that institutions like Michael Okpara University of Agriculture Umudike (MOUUAU), in spite of their large education service and recognition, still disseminate information manually. The problems associated with this manual system include severe time consumption, unavailability of emergency notifications, and poor communication outreach. This project is aimed at devising a system that will eradicate these problems.

The primary objectives of this study are to provide a user-friendly website, to implement a system that provides an easy way in which information can be forwarded to GSM phones via SMS and Email, and to facilitate the development of information technology. Ubiquity across an enterprise or campus is a very positive and exciting experience for the students, faculty, staff, and visitors. Having instant access to email, the internet, and other IT services irrespective of location can dramatically change the way constituents live, work, study, learn, and play.

2 MATERIAL AND METHODS

This research centers on the design and implementation of an online campus alert system for the staffs and students of MOUUAU. Usually, every work has some limitations. The two major limitations of this study are the high programming technique requirements in PHP, JQUERY, and MYSQL, as well as financial constraints that limit the frequency of investigation toward gathering necessary information.

The methodology involves the specification of procedures for collecting and analyzing data necessary to solve the problem. Primary data collection involved oral interviews conducted with various staffs and students of MOUUAU, reviewing and sharing their experience about the difficulties they undergo when using the traditional means of providing information. The interview method was utilized because it enables the respondent to understand the questions properly, as the enumerator is present to clear any doubts. It also ensures the collection of reliable data because of the close contact between the enumerator and the informant. An observational method was also applied, involving personal observation and recording of operations, including the examination of documents.

System analysis was meant to reveal the current system of administration and information flow, which relied heavily on physical notice boards and course representatives passing messages orally. The limitations of this existing system were identified as: (a) Time consuming processes for messages to reach receivers; (b) Unavailability of instant emergency notifications for situations like campus riots or natural disasters; and (c) Poor communication outreach where pasted messages hardly reach the minds of the readers.

3 RESULT AND DISCUSSION

Some factors were considered when designing the new system to achieve a good design standard. These included designing a system that captures data faster than the old system to improve efficiency, minimizing time wastage for quick processing of data collection, and disseminating information instantly to the staffs and students of the university.

3.1 Input and Output Design

The input to the new system requires forms entered through the keyboard. The forms include a Staff/Student Login Form, Message Form, New Admin Operator Form, New Staff Form, and New Student Form. The output form is designed to generate printable reports from the database to Excel format. The outputs generated include the Message Portal, Staff Dashboard, Staff List, Student Dashboard, and Student List. The application enables administrators to communicate via

channels such as SMS, email, and social media from one platform, handling simultaneous incidents in multiple locations on the campus facility.

3.2 Database Design and Architecture

Files used in this project are made up of different data types, securely stored using a MySQL database. All data is stored at one location, ensuring that tables are stored in a single file environment while acting as separate entities. The database structure ensures accuracy of data being stored through field-level validation.

Table 1: System Database Schema and Data Dictionary

Table Name	Field Name	Data Type	Description / Function
casdb_staffs_students	id	int(11)	Primary key for staff/student record
casdb_staffs_students	admin_id	int(11)	Foreign key linking to admin creator
casdb_staffs_students	name	varchar(50)	Full name of staff or student
casdb_staffs_students	email	varchar(50)	Electronic mail address
casdb_staffs_students	tel	varchar(15)	Telephone number for SMS routing
casdb_staffs_students	department	varchar(50)	Academic or administrative department
casdb_messages	id	int(11)	Primary key for message record
casdb_messages	sender_id	int(11)	Foreign key linking to message sender
casdb_messages	receiver	varchar(50)	Target recipient of the alert
casdb_messages	message	text	Content of the emergency or general alert
casdb_admin	id	int(11)	Primary key for administrator record
casdb_admin	username	varchar(50)	Login identification
casdb_admin	password	varchar(255)	Encrypted login credential
casdb_admin	operator_as	varchar(50)	Role assignment (e.g., Student, Staff)
casdb_admin	status	varchar(10)	Active or inactive account status

3.3 System Architecture and Logic Flow

The Top-Down design breaks down the web application structure. Upon entering the site address, the login page appears requiring a username and password. After authentication, the Main Menu leads to the Admin module (New Admin, Login), the Staff/Student module (List, Creation, Send Message), and the Message module (General List, Individual). The program flowchart dictates that new staff/student data is keyed in, validated, and inserted into the database. If validation fails, the user is prompted to re-enter the data. The message sending process involves selecting the target (general or individual), entering text, validating, selecting contacts, sending the SMS via the web server, and logging the transaction into the database upon success.

Table 2: Top-Down Module Architecture Overview

Primary Module	Sub-Modules	Functional Description
Authentication	Login / Logout	Secures access to the system using encrypted credentials.
Admin Management	New Admin Creation	Allows top-level creation of new operators and role assignments.
User Management	Staff List / Student List	Displays interactive tables of all registered campus constituents.
Registration	New Staff / New Student	Data entry forms capturing names, emails, contacts, and departments.
Messaging Engine	General List / Individual	Text area inputs routing data to the SMS/Email gateway for delivery.

3.4 System Requirements

In order to realize this project, specific hardware and software components were required to ensure an effective and efficient operation of the new system.

Table 3: Hardware and Software System Requirements

Category	Requirement Specification	Purpose
Hardware	Intel Computer System	Base processing unit for local server hosting or administration.
Hardware	Minimum 512MB RAM	Ensures adequate memory allocation for database queries.
Hardware	Minimum 40GB Hard Disk	Provides storage capacity for the MySQL database and logs.
Hardware	Uninterruptible Power Supply (UPS)	Prevents data loss during power outages during operation.
Software	Windows 98 or higher	Operating system environment for the local host.
Software	MySQL Database	Relational database management for storing user and message data.
Software	PHP, HTML, CSS, JQUERY	Core programming and scripting languages for the web application.
Software	XAMPP & Apache	Local server environment utilized during the development phase.

4 CONCLUSION AND RECOMMENDATIONS

The Campus Alert System for MOUAU Staffs and Students is an innovative addition to the education sector, as it makes the access and dissemination of information significantly easier and more efficient. It elevates Email and SMS technology to a highly relevant position in the educational sector for both emergency and general notifications. The objective of this project will be fulfilled if proper training is provided. The public relations officers and course representatives selected to use the system should be trained in computer operations, understanding the role computers play in education, and how to effectively utilize the internet and system applications. The campus alert system should be adopted universally by the university, as various departments can utilize the system to eliminate the time spent on the existing manual framework. Ultimately, the project provides an efficient, working program for the effective operation of a computer-based emergency and information system.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The author declares that there is no conflict of interest regarding the publication of this manuscript.

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