



MIGRANT FROM ON WALL NOTICE-BOARD TO AN ONLINE ANNOUNCEMENT DISPLAYING SYSTEM FOR TANZANIAN, COLLEGE'S

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Abstract

In Tanzania a developing country, now days there are many colleges, and usually whenever there is a big gathering of people living together like in a college an information spreading rapidly is very important. Using of wall Notice Board in every place is a tedious work since it needs to be updated vigorously and with correct and right information manually. An Online Announcement Displaying System (OADS) is presented here to reduce the delaying time of the information to spread across the College as well as managing the right information only to being displayed on the notice board. Research instruments such as observation and judgmental techniques were used to come with the definite result that the OADS will help the collegian to get the updates and know what is going on within the environment wherever they are at righty time. This system intends to simplify and improve the college performance in Tanzania since most of its organs use computerized system to perform their daily activities.

Keywords: OADS, delaying time, simplify, notice.

1. Introduction

In any College there is a lot of on wall notice boards placed on different location where by people with their announcements type on a sheet of paper and place it on the notice boards for other people to read when passing through those notice boards. Thus there is a lot of accumulation of papers due to carelessness of people who place them and no one who is responsible for removing it (Adkins & Grant, 2007). Also the announcement may not reach to those who are intended, as others may not having the habit of passing through those notice boards or may be because of the whether condition or sometimes the person is not living within the College compounds so it become difficult for them to see those announcements on time. And hence there is a lot of strain on the people who having announcements in hand by making sure that the announcements are placed everywhere, all these comes because the software is not used in this context.

This paper focuses on reducing the problems on managing the on wall notice boards and avoids the problems which occur when carried manually. Identification of the drawbacks of the existing manual notice board system leads to the designing of the OADS, Figure. 1 that will be compatible to the existing system which is more user friend and more GUI oriented (Zohedi, 2007). Though there is notice boards exists and they have been found to be adequate on delivering the information to the public but the way they operate or functionalities offers to users seems to be inadequate (Carlsbad *et al*,2001). Lack of system development in current environment, knowledge and the skills that were previously applied in the whole process of systems development was limited and not broad enough. Due to those facts we have decided to present this idea of OADS which will overcome the challenges facing the existing systems and operate better than the existing ones. The system shall be able to Register Users i.e. Administrator, Students and Staff members by ID's, First Name, Last Name, and Course for Students and Position for Staffs, User Name and Password. Show the posted notices corresponding to its time when the notice posted. When users want to post the notice then he/she must fill the form with his/her First Name, Last Name, Course for Students and Position for Staff and the Status of the notice i.e. Official Notice, Public Notice or Faculty Notice and submit to the administrator for approval and posting.

The remainder of the paper is arranged as follows: Section 2 describes Literature review. Technical Analysis and Design is dealt in section 3. Section 4 discusses the Implementation and Verification. Section 5 describes Information Security and Confidentiality of the system .Section 6 discusses the Advantages, Limitations and Weakness .Section 7 contains the concluding remarks.

2. Literature Review

This part provides a perspective of literature relevant to OADS in an organization. The Virtual Notice Board which developed using Visual Basic by (Riyad, 2003). This program is based on Computerized Notice System that stores information about the notices of the chief, officials and faculty members of an organization. In order to view and post notices the chief, officials and faculty members each must create a valid account and only then they can generate notice and also they can edit or update notice. After selecting a notice, members can view it through the form with data table and many more.

Also the Notice Board Pro which is an online application written in PHP and MySQL by (Dixon, 2011) was reviewed. The Notice Board Pro is an application that enables users to create and view items that have been created by other users. Users can use the notice board to, for example advertise a car for sale, a room to rent, a fridge to sell, a service and so on. When viewing items you can choose to view all the items on the notice board or, alternatively, only those items that fall within a particular category, say vehicles, household items or accommodation, or perhaps all three. To create an item yourself, you need to be registered and signed in.

(Chang & Sheu, 2002) described the design and implementation of a learning technology project. A wireless platform is developed for teacher and students to establish a classroom dynamically irrespective of location and time bounds. As supported in a traditional classroom, they develop information technology to provide the teacher with teaching aids, such as blackboard, board rubber, coloured chalk, microphone, voice recorder, video recorder, and so on, for course teaching and discussions in an ad hoc classroom. Also they provide students with an electronic schoolbag (or eSchoolbag) which packs electronic book, notebook, parents contact book, pencil case, writing materials, sheets, calculator, address book, and so on. Taking lessons in a lively, vivid, and new learning environment, students are expected to enhance their learning performance without any burden like attending classes physically. Moreover students get more flexible scope of learning at a convenient time.

(Mansikkaniemi *et al* ,2002) developed an electronic bulletin board which can be accessed by members of a family from their wireless devices. The wireless devices for various members of the family can access a common database, which produces an appearance of a bulletin board having notes attached thereto. The notes may be generated manually, may be generated from e.g. a calendar, or may be the result of a short message service contact. The notes may be of various colors to indicate their origin or importance. The notes may be moved around on the board and any member of the family may generate new notes.

3. Technical Analysis and Design

The requirements of the proposed system were derived from the data that contained in the system inputs and outputs which are word documents. The data flow diagrams, context diagrams, and entity relationship diagrams were fully employed. All these models gives the conceptual view and validate analyzed end-user requirements (Wieggers, 2003), (Wennmyr & Ericsson, 1996). As a major modeling tool, entity relationship diagrams helped in organizing the data in the project into entities and also define the relationships between the

entities. This process enabled the analyst to understand database structure so that data can be stored and retrieved in a most efficient manner. DFDs showed the flow of data from external entities into the system. It also showed how data moved from one process to another as well as its logical storage.

3.1 System and User Requirements

The following are the system requirements, functional and non-functional requirements (Scacchi, 2002) of the OADS in order to perform its intended roles.



Figure. 1. Advancement from hardware notice board to OADS

3.1.1 Functional Requirements

The system designed with all the commons online based system have, with the following important functions of it, uploading notice which is in word, pdf, or excel file, record notes uploading time, allow users (administrator, staff, and students) to read the posted notice through downloading them first.

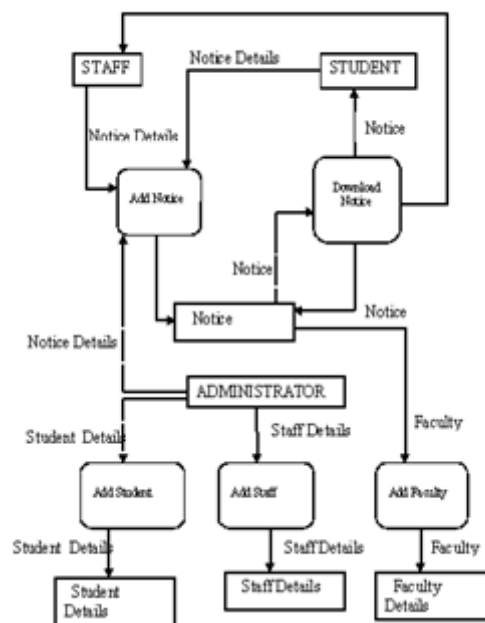


Figure. 2. Data Flow Diagram for the OADS

3.1.2 Non-Functional Requirements

This information system adheres to all crucial non-functions like, accessibility, reliability, portability, interface and security (Mylopoulos, 2009). As it works in Colleges it has been designed to be accessed by large number of people at the same time. It is capable of storing the posted notice and allow free download for users. The application is developed by using PHP. Developed in PHP and MYSQL as is database found in, make it to run on Windows and other operating system provided. Its interface can be easily accessed through internet explorer, Mozilla Firefox and any other windows and Linux browser that is compatible with the scripting language used in developing the system. For security, all registered users will login to the system for the first time using their registration number for students, or staff identification number for staff as the username and, surname as password but they are required to change them after the first login to the system.

3.2 Data Flow and Data Flow Diagrams (DFD's)

Data Flow Diagram is the logical representation of the data flow of the project. (Benedusi *et al*, 1989). Figure 2 shows the DFD's of the proposed system, where by the flow of data from external entities into the system and how data moved from one process to another is well elaborated.

3.3 System Use Case

Through use case diagram we are graphically representing how the user is interacting with the proposed system by model the functionality of a system using actors and use cases (Lee & Xue, 1999), (Ross & Schoman, 1977).

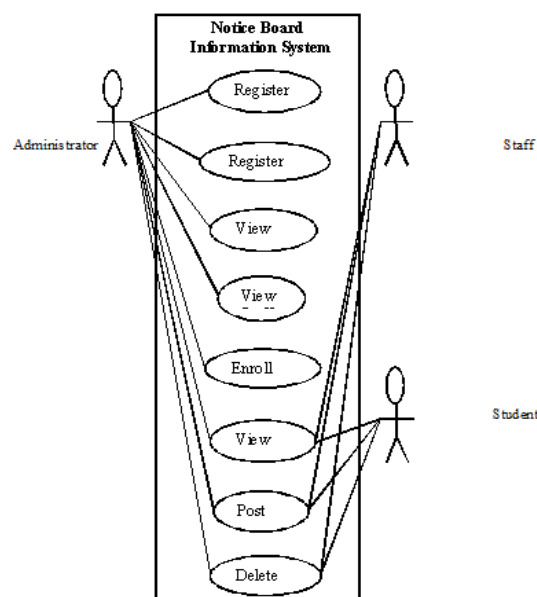


Figure. 3. The OADS use case diagram.

In Figure. 3, Administrator means: the system administrator whose duties is to post the allowed announcements through uploading or typing on the text box provided, read the posted announcements through downloading them first, delete outdated announcements and archive where necessary, register staffs, and students, view staffs and students. Staff means: any employee in the college, s/he is capable of posting announcements to the system through uploading or typing on the text box provided, read announcements posted by others through downloading them first. Student means: any registered student in the college, this will be capable of posting announcements to the system through uploading or typing on the text box provided but after being given the right to do that by administrator, read announcements posted by others through downloading them first.

3.4 Database Design

A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently. The general objective is to make database access easy, quick, inexpensive, and flexible for the user. Relationships are established between the data items and unnecessary data items are removed. Normalization is done to get an internal consistency of data and to have minimum redundancy and maximum stability. This ensures minimizing data storage required, minimizing chances of data inconsistencies and optimizing for updates. The MySQL has been chosen for developing the relevant databases.

3.4.1 Entity Relationship (E-R)

We have used E-R model to represent the conceptual design of the database. It uses diagrams to identify four types of objects which are, an entity which is equivalent to a database table, an attribute which is equivalent to a table column, a key is equivalent to the primary key in the normalization and a relationship which is an association between entities. Figure 4 explores our database using E-R design model whereby we have four entities which are Faculty, Staff, Notice and Student.

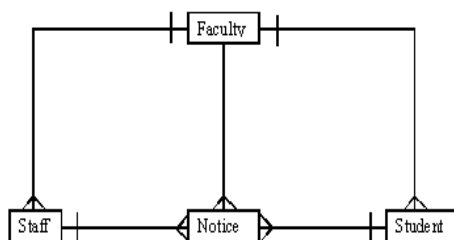


Figure. 4. The E-R diagram of OADS

4. Implementation and Verification

4.1 System Implementation

The database: User details like ID's First Name, Last Name, and Course for student, Position for Staff, Username and Password are stored in a MYSQL database. Also the database store posted and archived notices.

Application programs: There is a middleware program between the browser and the database developed using PHP having the following functions: (1) Provision of access to the database. (2) To register users to the system. (3) Verification of the username and password for the registered users. (4) Enable the registered users to login to the system. (5) Response when database is not found or when either username or password do not match to those stored on the database. (6) Enables notice to be posted to the database. (7) Enable users to read those posted notices. (8) Enable the archiving of the outdated notices. (9) Enable user to logout.

Input/output devices: When user wants to post the notice to the system then s/he can either type it directly on the text box provided by the post menu or s/he can upload it from his/her USB flash, external HDD or directly from s/he PC.

Hardware: For the system to perform well a Networked computers, connected to the well-equipped server is required.

Software: In order for the system to work properly also there are series of software which will be required to support the roles of hardware mentioned above to complete the successfully functioning of the system. This software includes: Windows Operating system which may be Windows 7 or Linux, A Web server, which may be Wampp or Xampp Adobe Dreamweaver 8 Software and later versions.

4.2 System Verification

The OADS has undergone several testing during its development and after completion (Marciniak, 2002). The database system together with the interfaces is running on a window-based operating system. MySQL data manipulating language will be used as the query language. The graphical user interfaces designed using CSS (Cascading Style Sheet). For the system to run therefore must be installed on windows operating system or

Linux operating system, and query language such as Sql. Xampp or Wampp server 1.7.3 and later versions can be used as a web server, and Notepad++ or Active State Komodo Edit 6 used as editors for writing and viewing codes.

4.3 System Features

The OADS system consist of different webpages features carrying different functionalities of the system with different interfaces. In this section we are describing a screenshot of some important screen functions of the system as shown in Figure 5 and 6.



Figure 5. A, B, The home page and Administrator page of the proposed OADS system respectively.

Figure 5A, show the welcome page of OADS system whereby on the left hand side there is an instructions for student to do registration in the system for the first time. The staff and system administrator are given instruction to register in the system on the right side. The page for administrator to manage several function of the system is shown in Figure 5B.

The page for a user to post announcement is shown in Figure 6A, where by any registered user can access it and operate on it as per his/her rights permission, where by the poster will be required to enter the notice/announcement title, the notice which will be seen as a preview before other user decides to download the notice. Figure 6B, show the announcement displaying page, where by the poster ended can view and download the announcements.

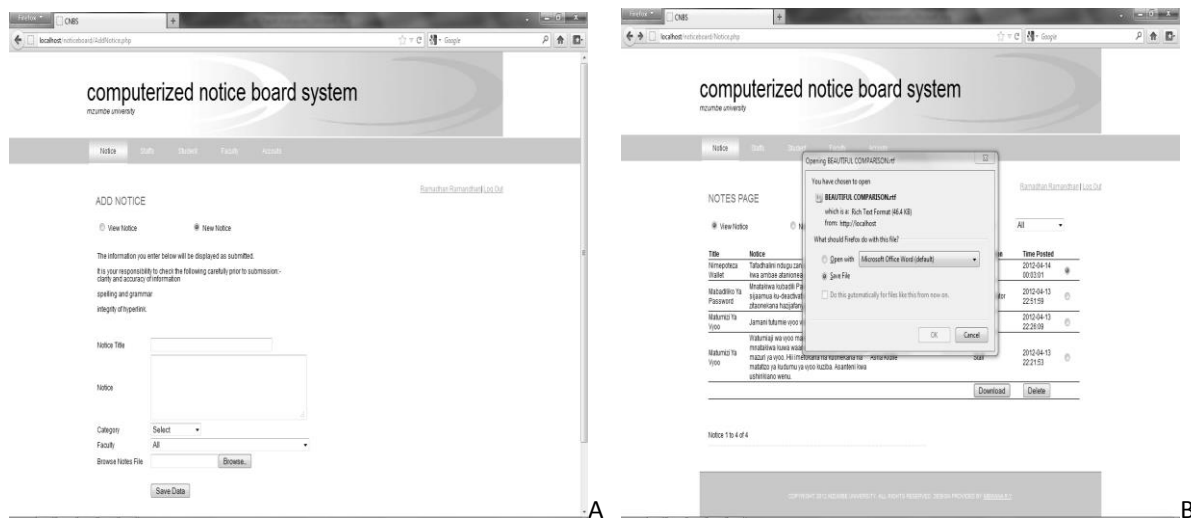


Figure 6. A, B, Post and Announcement displaying pages respectively of the proposed OADS system

5. Information Security and Confidentiality

Data and information within the system must be highly protected so as to maintain the quality of the system. To make this, some measures must be taken into account. Some of these measures are:

5.1 *The use of password*

It is very common means of authentication where in order to protect the system, password is needed to prevent the system from unauthorized users. Every user registered to the system is eventually his/her user account within the system is accessed through username and password.

5.2 *The use of user accounts*

Every user of the system shall have his/her own account in which all operations and services of the system he/she is entitled to will be performed there. Though there is no definite level of clearance among users, but still there is difference between the created accounts for administrators, staffs, and students.

5.3 *The use of firewall and antivirus software*

Firewall within the server and the installed antivirus can be used by database and system server to protect the server from intruders and viruses. Only specific request and specific port can be opened to receive the requests and answer them.

5.4 *The use of Uninterruptible Power Supply (UPS)*

Provided to prevent the computer and network from blackout and electricity problems. Also it can protect data and network equipment from any damage which is caused by frequent electricity cut.

6. Advantages, Limitations and Weakness

It provides "better and efficient" service to user, where user have no reason to waste a lot of time on typing, printing and travel along those places where notice-board placed for them to place their notice in order to deliver the information to the public (Skanor *et al*,2003). All information within organization will be available on a click, where people with computers and internet access will be able to read/post notice and other announcements from/to the system. Any education institute or organization can make use of it for providing information to its public. It can be used in offices and modifications can be easily done according to requirements and users.

On contrary for the developing country not all students can have computers and reliable internet connection so the system cannot be utilized effectly. Also since it is a web based system, there can be some delay of information when a server hosting the system is down.

7. Conclusions

In the college, upon successfully utilizing this system there will be no need for students and staff members to walk around to read or post announcements on the notice boards located on different places. On monitoring the posted notices, the administrator can either delete or archive the outdated notices in order to control the accumulation of notices in the database. The system has reached the steady state where all bugs have been eliminated. The system operates at a high level of efficiency, all the students and staff members associated with the system understands its advantages, also the system solves the problem it was intended to solve as requirements specification. Finally the uses of papers and energy have been reduced by 90% through using the OADS

8. Recommendations

Our system can be developed further to include, Short Messaging Service (SMS) where by members cell-phone numbers has to be stored into the system database. Through small developed stub the system can send notice to students and staff members directly to their phone number. GSM based Digital Notice Board, the system can be advanced to a system with digital notice board where the notice can be typed or edited on the PC and then sent to every display connected to the system.

REFERENCES

- [1] B.Adkins, E.Grant "Backpackers as a community of strangers: the interaction order of an online backpacker notice board". *Qualitative Sociology Review*, 3 (2), 2007.
- [2] F.N. Zohedi, "Wireless Electronic Notice Board System" University Malaysia Pahang, Malaysia, 2007.
- [3] B.D.Carlsbad, A.N.Palo Alto, W.S.Carlsbad, G.C. LaJolla, J.S. MenloPark "On-line Menu Updating for an Electronic Book" Patent Application Publication, United States, Feb 27, 2001.
- [4] T.H.Riyad,"Virtual Notice Board" www.bissoft.tk, 2003.
- [5] J.P.Dixon,"NoticeBoardPro"http://www.noticeboardpro.com/index.html, 2011.
- [6] C.YungChang, J.PingSheu "Design and implementation of ad hoc classroom and eSchoolbag systems for ubiquitous learning" IEEE International Workshop on Wireless and Mobile Technologies in Education, Pg. 8 – 14, 2002.
- [7] T.Mansikkaniemi, T.Keinonen,H.Wikberg,K. Tampere, V.Helsinki "Wireless family bulletin board" Patent Application Publication, United States, May 30, 2002.
- [8] K.E.Wiegers "Software Requirements" Microsoft Press Redmond, WA, USA, 2003.
- [9] E.Wennmyr,T.L.M Ericsson "System and Method of Interactively developing desired computer programs by using plurality of tools within a process describes in Graphical language" Patent Application Publication, United States, Jan 16,1996.
- [10] W.Scacchi "Understanding the requirements for developing open source software systems" *Software, IEE Proceedings - (Volume: 149, Issue: 1)*, Pg. 24 – 39, Feb 2002.
- [11] J.Mylopoulos "On Non-Functional Requirements in Software Engineering" *Conceptual Modeling: Foundations and Applications*, Springer Berlin Heidelberg, pp 363-379, 2009.
- [12] P.Benedusi, C.P. Italy, A.U.Cimitile. U. De Carlini, "A reverse engineering methodology to reconstruct hierarchical data flow diagrams for software maintenance. ", *Proceedings Conference on Software Maintenance*, pg. 180 - 189, 1989.
- [13] J.Lee, N.L Xue, "Analyzing User Requirements by Use Cases: A Goal-Driven Approach," *IEEE Software*, vol. 16, no. 4, pp. 92-101, doi:10.1109/52.776956, July-Aug. 1999.
- [14] D.T Ross, K.E. Jr. Schoman, "Structured Analysis for Requirements Definition" *IEEE Transactions on Software Engineering*, (Volume: SE-3, Issue: 1) Jan. 1977.
- [15] J.J. Marciniak "Acceptance Testing" *Wiley Online Library*, DOI: 10.1002/0471028959.sof003, 15 January, 2002.
- [16] A.B Skanor, M.H Lund, T.G Malmo "Method and System for Using an Electronic reading device on non-paper devices" Patent Application Publication, United States, Jul 15,2003

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