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Design and Development of an M-Mobile Notice Board System for Institutions.

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ABSTRACT - This work contributes to the trending technology on mobile phones by designing and developing a means of faster and efficient means of information/ notification dissemination system in an institution using Smartphone application. It generally, will eliminate many challenges facing the current system of notification in the university like; paper wastage, slow information circulation, and many others. This system was designed and developed using Android Studio for graphical user interface (GUI) aid and high-level programming language, JAVA. In addition, appropriate security measures are built into the design to ensure that only the targeted audience is addressed.
KEYWORDS- Efficent, Fast, Security, Java and Notification Dissemination.

I.   INTRODUCTION

A notice board is a display where information, notices, and advertisements are displayed for respective audience. It is structured to be in form of a wooden or metal sheet, square or rectangular in shape where different papers that contain information are pegged or pasted on.

Generally, innovation has taken place in the design of a notice board system by making it a digital display. In this digital display, no paper is being pegged or pasted. Every information is sent from any department within the university through wired connected PCs, to a central control server. This was introduced as an advancement of the notice board which is reprogrammed whenever there is new information. This was the approach used in 'Digital Notice Board (DNB)', and 'Electronic Notice Board for Professional College' made their approach wireless. This approach is not efficient for immediate information dissemination outside the school premises.

However, due to the recent development in mobile phone devices, which involves making mobile phones smart for the users, easy installation of user friendly applications, and the ability to access the internet through local network providers. Hence, these features affected the increase in the number of smart phone users in our society as projected by Channelpost in 2014. Adding to this trend of development, the design and development of a user-friendly application for smart phones, will contribute by making users in the school community get the latest information from their institution where ever they are without going to the notice board.

II.   METHODOLOGY

The design and implementation of the system is critically presented and analysed using structural approach. The entire system is designed to ensure systematic dissemination of information to the targeted audience. Appropriate security measures are built into the design to ensure that only the targeted audience is addressed while those not meant for the information are excluded.

The entire system functions are, the display of information to the targeted audience, the security of the disseminated information so that it will not be distorted. It's also designed to operate on real time. The implementation of the system involves both hardware and software design;

A composite block diagram of the system design is shown in figure 1. The hardware is the interface between the user and the notices; the software is the interface between the hardware and the codes (computer language); then the internet is the communication link between the users.
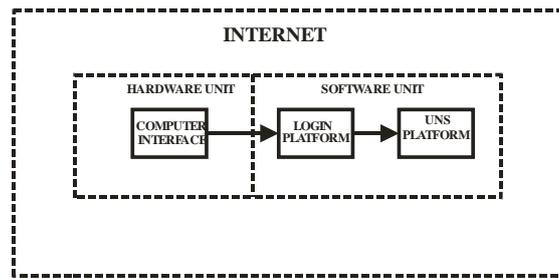
Figure 1; Block diagram of University Notification System

Software Unit

The software unit is the user interface between the hardware and the notices. Different modules of operation are designed and brought together in this unit to perform their specific tasks. Top-down designs of the modules were carried out step by step from their algorithm through the coding of the modules. The software unit has different functions as shown in the block diagram in fig 2. Android studio was used in the design of the software.

Figure 2; Top-Down Block diagram of the Software unit of UNS

Interface

The mobile phone graphical user interface (GUI) accommodates the UNS application launcher icon where the user launches the application to make use of it. It takes the user to the application platform where notifications are viewed or being posted to a selected audience.

The design algorithm of launcher icon is as follows;

Step 1:   *Start*
Step 2:   *design icon launcher image*
Step 3:   *choose image scaling of 7.2pixel*
Step 4:   *save image assets*
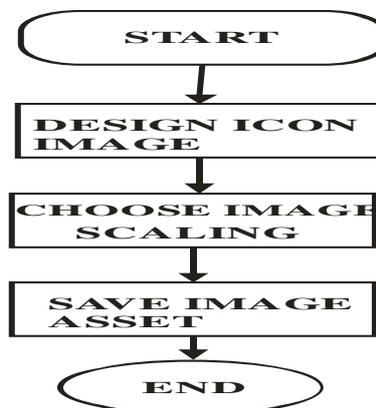*Step 5:*   *end.*

Flow Chart

Figure 3. Launcher Icon Flow Chart

Login Platform

This platform has the major design function of user identification and authentication. It has a data base design which takes care of the entire user's data. The login platform is a process, as shown in figure 4 which is made up by three different modules; sign in page, sign up page and profile page.

Figure 4: Login Process Block Diagram

Sign-in Page Platform

        The Sign-in page design platform displays the UNS logo and two text lines; student's matriculation/Staff number and password for proper security and authentication. It accommodates two hypertext options to be clicked on written 'Sign in' and 'Sign up' respectively.

The 'Sign in' hypertext will allow the user to sign-in with the correct combination of student's matriculation number or staff's number and their respective passwords for authentication and identification.

The 'Sign up' hypertext will however allow new users to register into the system by giving their information for further login.

Design Algorithm for the Login and Authentication platform is as follows

Step 1: Start
Step 2: Launch   UNS
Step 3: Request User Authentication with Matric/Staff no. and Password
Step 4: If (User Account is invalid)
          Then Go to Step 5
          Else Go to Step 3
Step 5: Request User to Sign up
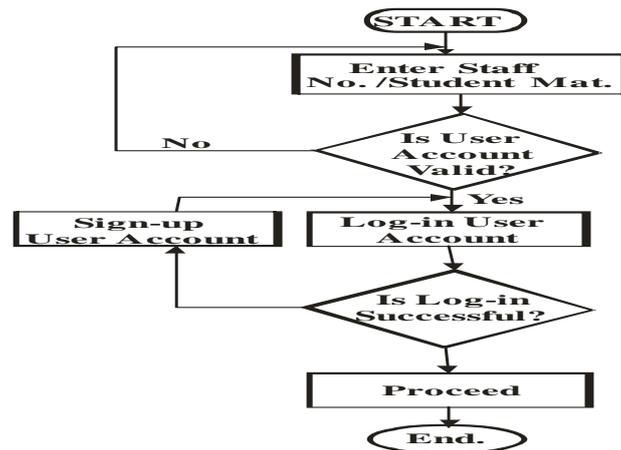*Step 6: Stop.*

Figure 5: Sign-in page platform flow chart

Sign-up Page Platform

        The sign-up platform design has a 'proceed' text box and four text lines for user information, which include;

User's full name
User's matriculation number or staff number.
User's password and
Password confirmation.

Design Algorithm for the Sign up platform first stage is as follows

Step 1: Start
Step 2: Enter User Name
Step 3: Enter Student's Matriculation/Staff number
Step 4: Enter User Password
Step 5: Confirm User Password
Step 6: If (Password matches)
      Then Go to Step 7
      Else Go to Step 5
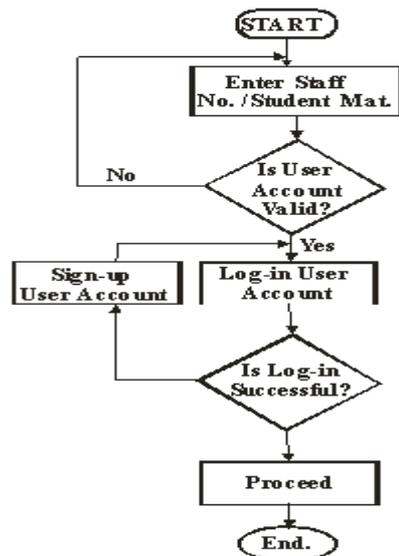*Step 7: Select Proceed*
Step 8: End.

Figure 6: Sign-up Platform Flow Chart

Profile Page Platform

The third platform in the design of Login, is the final stage of signing up which is the Profile platform. It will appear after clicking on the 'proceed' text box in the first stage of the sign up. It displays a platform for user's profile like, the user's institution, faculty, department, user's phone number, email address, role and user's gender. This is where the selection of user's role determines the notices the user will receive or sends.

Hence, the institution, faculty, department and the role has their various options for the user to select the right user profile. The selection of an Institution will filter the different faculties of the school, as well; the selection of a faculty will filter the faculty departments only. Then the role has the option of user's activity in school, from a student to the admin staffs.

Design Algorithm for the third platform is as follows,

Step 1: Start
Step 2: Confirm User name and Number
Step 3: Select Institution
Step 4: If (User institution is not shown)
        Then Go to Step 6
        Else Go to Step 5
Step 5: Select User Faculty
Step 6: Select Other
Step 7: Type-in User Institution
Step 8: If (User Faculty not shown)
        Then Go to Step 10
        Else Go to Step 9
Step 9: Select User Department
Step 10: Select Other
Step 11: Type-in User Faculty
Step 12: If (User Department not shown)
        Then Go to Step 14
        Else Go to Step 13
Step 13: Select User Department
Step 14: Select Other
Step 15: Type-in User Department
Step 16: Type-in User Phone Number
Step 17: Type-in User Email Address
Step 18: Select User Role
Step 19: If (User Role not shown)
        Then Go to Step 20
        Else Go to Step 22
Step 20: Select Other

Step 21: Type-in User Role
Step 22: Select Gender
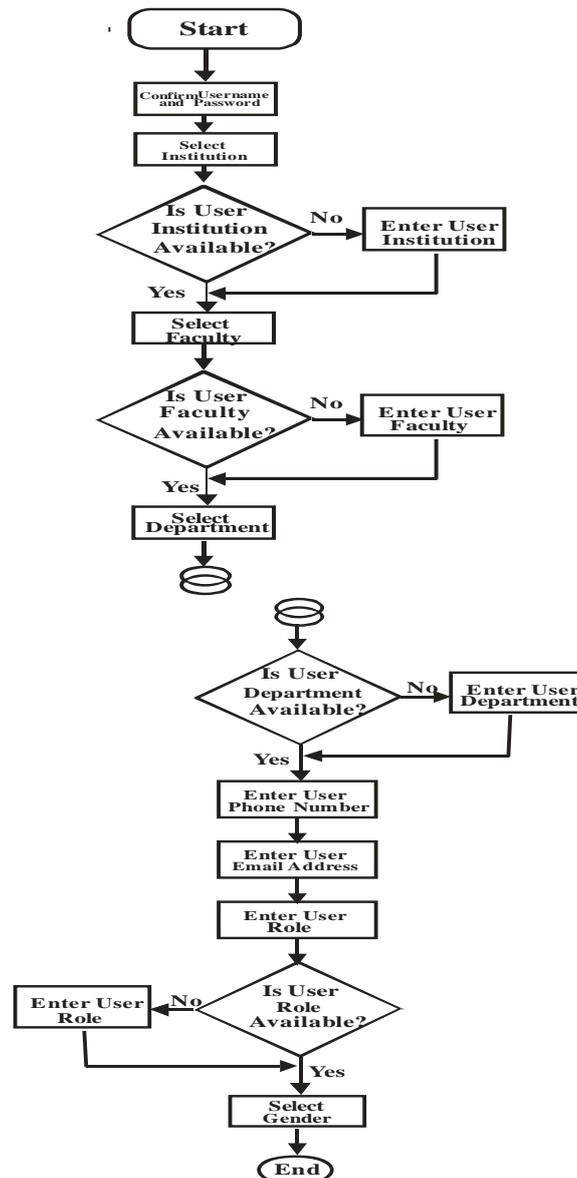*Step 23: End.*

Figure 7: Profile Platform Flow Chart.

Hence, clicking on the Sign up confirmation text box will store the user information in a database before moving to the next platform.

III.　USER'S PLATFORM

This platform is the UNS function display page, which is the active page of the UNS where the user's view and post notices. It displays the different active functions of the UNS as shown in the block diagram in figure 8.
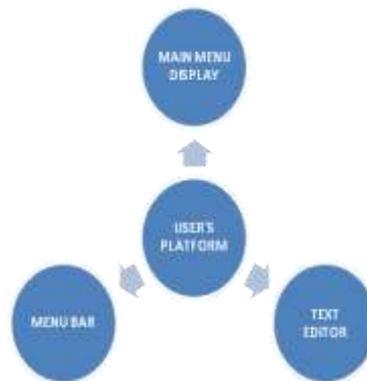
Figure 8: User's Platform Block Diagram

User's platform design algorithm is as follows,

Step 1:   Start
Step 2:   Open User Platform
Step 3:   Do you want to view Broadcast?
          If yes
          Go to Step 4
          Else Go to Step 5
Step 4:   Select broadcast bar
Step 5:   Do you want to view notices?
          If yes
          Go to Step 6
          Else Go to Step 7
Step 6:   select notice board bar
Step 7:   do you want to view members?
          If yes
          Go to Step 8
          Else Go to Step 9
Step 8:   select member bar
Step 9:   Do you want to send notice?
          If yes
          Go to Step 10
          Else Go to Step 11
Step 10: select text editor
Step 11: do want to use menu bar?
          If yes
          Go to Step 12
          Else Go to Step 3
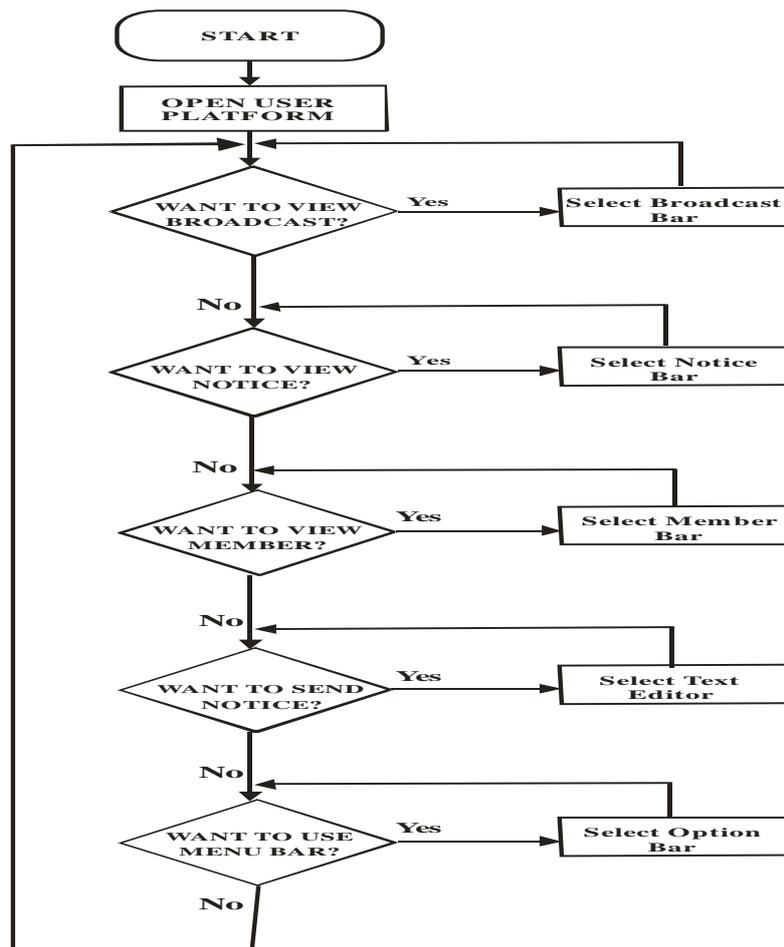*Step 12: Select menu bar*
Step 13: Stop.

The Flow Chart

Figure 9: User's Platform Flow Chart

Main Menu Display

      This is designed to have three information bars where the user can view various information on broadcast, notice and the number of users in the same class or department. The information bars are defined as broadcast notification, notice board and members.

Broadcast Notification Page:

Broadcast page shows the user the list of broadcast received and sent, the date and time with the sender's information.

Notice Board page:

This page shows a specific notice for the user with the date and time of sent. Notices from the user's choice on school, faculty, department and class.

Member Page:

Member page display the names of various users in the same class/department with the user.

Main Display Design Algorithm is as follows

Step 1: Start

Step 2: Any new information?

          If yes

          Go to Step 3

          Else Go to Step 8

Step 3: Select notice board page

Step 4: Any new information in notice board?

          If yes

          Go to Step 5

          Else Go to Step 6

Step 5: View notice

Step 6: Select broadcast page

Step 7: View broadcast notice
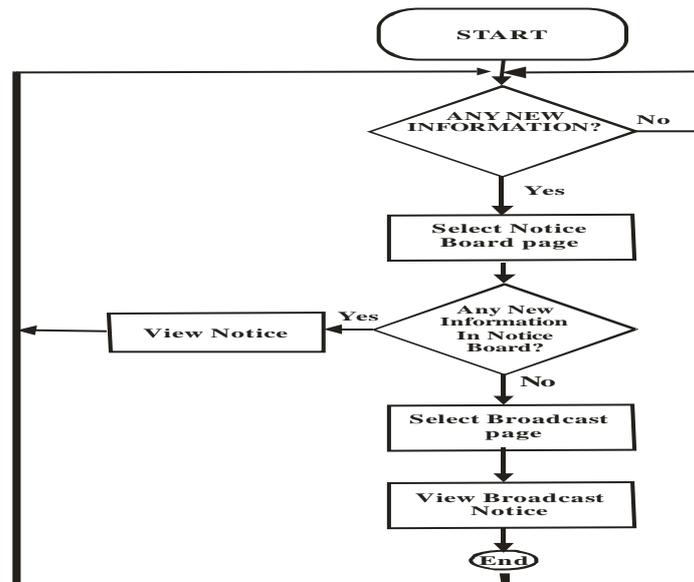
Step 8:   Stop.

Flow Chart

Figure 10: Main Menu Display Flow Chart.

Menu Bar

The menu bar is designed to have a four sized parallel line icon on the main display page. It houses the user's Profile editor, About, Home, Admin and displays the user's name and department.

Profile Editor:
The profile editor is an access designed to aid the user in updating his/her profile information and save the new changes.
Home:
The Home, when selected will bring the user back to the main display page.
Admin:
The Admin is an option designed as a feedback message route from the user to the UNS admin through an email message.
About:
This design shows the user a text summary of UNS.
Menu bar Algorithm is as follows,
Step 1:   Start
Step 2:   Select menu bar
Step 3:   Do you want to edit profile?
                If yes
                Go to Step 4

Else Go to Step 7
Step 4:   Select profile
Step 5:   Edit profile
Step 6:   Save profile changes
Step 7:   Do you want to send message to admin?
                If yes
                Go to Step 8
                Else Go to Step 11
Step 8:   Select Admin
Step 9:   Send message to Admin
Step 10: Select Home
Step 11: Do you want to view about UNS?
                If yes
                Go to Step 12
                Else Go to step 10

Step 12: Select About
Step 13: Stop

Text Editor

The text editor is designed for notice and broadcast posting. It has a pencil like icon on the main display page. The design is that, only the eligible users like the class representative and the secretaries can post notices, while every user can post broadcast information.

Notice Posting:

The role of class representative and the secretaries are the only eligible role designed for notice posting. They send notices to their designated classes and departments respectively.

Broadcast Posting:

Broadcast notice was designed to be used by every user for the purpose of possible user's advert posting, ceremonies and event posting.

Text Editor Design Algorithm is as follows,

Step 1: Start
Step 2: Select Text Editor
Step 3: Do you want to send notice?
> *If yes*
> *Go to Step 4*
> *Else Go to Step 11*
Step 4: Select notice
Step 5: Is user role eligible?
> *If yes*
> *Go to Step 7*
> *Else Go to Step 6*
Step 6: Push up not Eligible message.
Step 7: Select user class/Audience
Step 8: Type in message subject
Step 9: Type in message body
Step 10: Post message
Step 11: Do you want to send Broadcast?
> *If yes*
> *Go to Step 12*
> *Else Go to Step 17*
Step 12: Select broadcast
Step 13: Select Audience
Step 14: Type in Subject
Step 15: Type in Message body
Step 16: Post Broadcast
Step 17: Stop

Internet

The internet is the carrier network of the notices from the sender to the receiver. Every user need to subscribe to any network provider within user location for an access point link, to the internet network for updates on any new notice available.

IV. RESULT AND DISCUSSION

This section is about the results obtained from the design of the various modules of UNS application software. The results were obtained from the installation and launching of UNS in a smartphone device, and a screen shot of the different modules were taken.

Interface

The physical display access on the mobile device which shows the UNS icon.

The UNS icon launcher is shown in figure 11 surrounded with other applications locating at the third roll number two.

Figure 11: Screen shut of Mobile device Interface showing UNS Launcher.

Login Platform

The user login is the next module after UNS icon launching. The figure 12 and figure 13 shows Sign-up/Sign-in page and Profile page respectively.
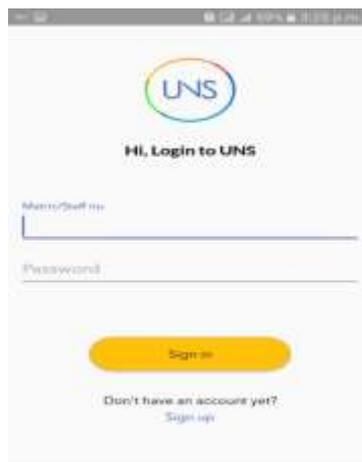

Figure 12: Screen shut of UNS Sign-in Page.

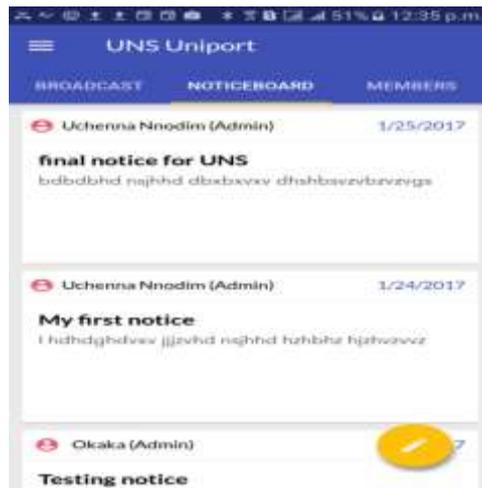**Figure 13: Screen shut of UNS Sign-up Page**

User's Platform

This is the main interaction display for the UNS user. It has three different GUI modules on the;

Main Menu Display

Menu/Option Bar

Text Editor

1. Main Menu Display

Figure 14: Screen shut of UNS Main Menu Display

The main menu module, displays the text editor icon, the menu/option bar icon and three main menus with their pages. The figure 14 above displays notice board page with some notices.

2.   Menu/Option Bar

Option bar Module displays the user profile name with user department with some sub modules with their icons as shown in figure 15.

The sub module like the setting has the profile page, the sub module 'About' displays a text summary of UNS.

3.   Text Editor

The text editor icon on the main menu display, displays two icon module for notice and broadcast message posting respectively as shown in figure 15.
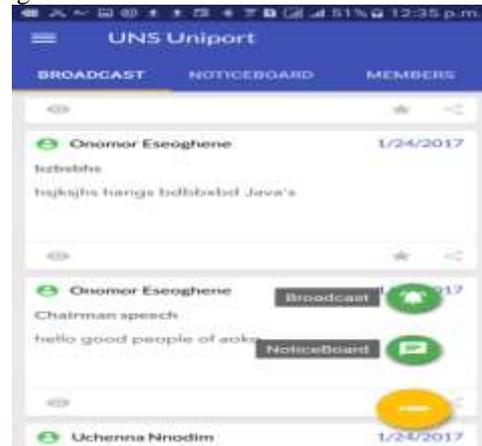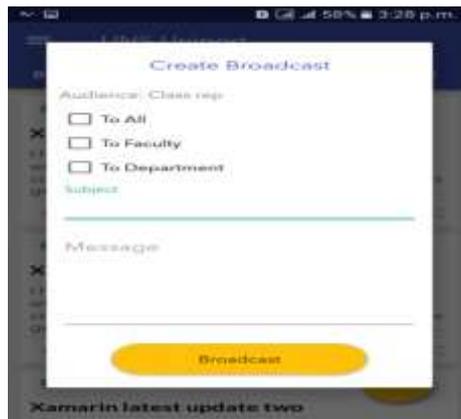

Figure 15: Screen shut of UNS Text Editor Sub Module Display

The notice board posting sub module has its display as shown in figure 16, while figure 17 shows the display of broadcast posting sub module display.
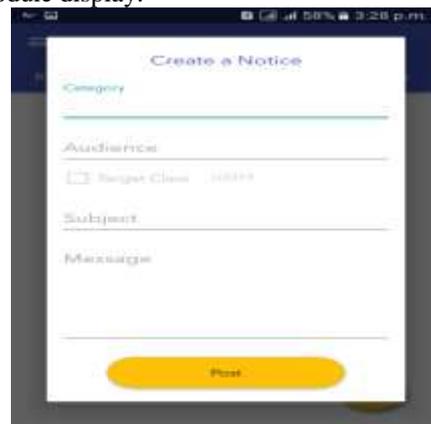
Figure 16: Screen shut of UNS Notice creating Sub Module Display

Figure 17: Screen shut of UNS Broadcast creating Sub Module Display

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V.   CONCLUSION

The design and development of this smart phone notification system for institutions, was very necessary to eliminate the challenges of improper information dissemination, paper littering and lack of notification space for wooden notice boards, with other challenges facing the university existing notification system. However, the design of software based notification system for smart phones makes every user to have access to all notifications at their hand anywhere and anytime a notice is sent.

The University Notification System (UNS) is an idea designed for everyone in the university, staffs and students to adapt to proper information and notice circulation.

ACKNOWLEDGMENT

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