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DEVELOPMENT OF DIGITIZED INFORMATION BOARD WITH SMS-BASED INFORMATION SYSTEM

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ABSTRACT

This study developed a Digitized Information Board with SMS-Based information system. This study was conducted during the 2nd semester AY 2016-2017 to provide a new system in posting and disseminating information announcements and responding inquiries through SMS-Based to solve the encountered problems in the existing system in Southern Leyte State University-Tomas Oppus Campus. Data were collected through descriptive survey method using the adapted questionnaire distributed to the respondents. The developed system was evaluated to determine the effectiveness and efficiency of the development and its contribution to the operations of the development. The Digitized information board with SMS-Based information provided a user-friendly environment. A digital board (Large Monitor Screen) was utilized as a digital information board that serves as the kiosk or portal for the announcements disseminations. It established security in which the staff, faculty and student leaders have user's level control of the system. The system stored encoded announcements via the server computer and could accept information through SMS format. During inquiry process, specific keywords in SMS format were required to retrieve information directly. This study can be used in other offices and departments as well as outside offices of the university.

Keywords: Descriptive survey method, Digitized Information Board, SMS-Base Information System, effectiveness and effiiciency

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

INTRODUCTION

The developed system was employed with latest trend of technology using large monitor embedded with SMS capability to address the different problems being encountered by the users in the department. In view of the fact that the Southern Leyte State University-Tomas Oppus offices and department are already having computers, then a digital information board with SMS-Based Information System will be developed to improve the current or replace the existing manual bulletin board into more technologically advance system to be utilized by the department. The developed system was customized that fits the needs of the users using electronic bulletin boards will allow the users to post and read messages via SMS capability and in large digital monitor that act as media for the information dissemination of the entire people of the department that made it as far advanced and unique to the existing digitized board available. Thus, this proposed system for IT department will be of great help in posting, disseminating announcement and replying different concerns/queries inside the campus specifically in IT department. Electronic board with public message posting, millions with like interests can post, read, and provide immediate feedback as cited by Michael James et. al (2009). This was agreed with the study of Elizabeth F. Churchill et. al (2009) that Electronic community poster boards serve an important community building function. Posted fliers advertise services, events and people's interests, and invite community members to communicate, participate, interact and transact. The electronic bulletin board receives a message, converts it to an icon message, and displays the icon on a display portion Yoichi Miyazawa (2001). Huthaifa Luay (2012) cited that Wireless electronic bulletin board with information needed for users in universities, bureau, businesses, and marketing. The application consists of two parts, a client and a server. The GUI in the client is designed to enable the user to send data easily. The GUI has many options, of the most important choice that the messages that need to be sent frequently saved in the form of a database, as well as these messages can be changed as needed. The presence of the technological advancement is very essential tool in improving the current system in every department, including the Southern Leyte State University-Tomas Oppus IT department. Adapting to this developed system technology it will be more beneficial to the department to have digital way of sending and posting information in a form of electronic or digital information board. With the present innovations of electronic board being developed there are some features which did not include the researcher needs to address in terms of embedded systems is concerned. As observed, the IT department of Southern Leyte State University-Tomas Oppus still relies on manual operation in posting and disseminating information that causes major problems in notifying the students. The department has existing strategy in keeping and posting records, which are the manual instructor's locator and manual answering of different queries. This kind of activity or practice needs to be enhances because nowadays people are already dealing with technologies that had improved their lifestyle. This study developed a Digitized Information Board with SMS-

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Based Information System for SLSU-Tomas Oppus. Specifically, it sought to answer the following questions:

1. What is the level of performance of the developed system in terms of:
    1.1 accuracy;
    1.2 availability;
    1.3 effectiveness; and
    1.4 Efficiency?
2. What are the problems encountered in the developed Digitized Information Board with SMS-Based Information System?
3. How is the developed Information System being implemented?

METHODOLOGY

Research Flow

At first, the existing system of the IT Department of Southern Leyte State University-Tomas Oppus was carefully observed and know the different needs of the department in terms of information disseminations were identified. The development of the system took place based from the observations of the users in the department. The development will have focused on the automation of the manual system which the researcher needs to address and embed the needed features to be included in the development of the system and measured its effectiveness. Then, pertinent data were gathered to test the existing system using standardized questionnaire for the systems evaluations and SLDC model to follow the standards in the software development. This study focused on the development and the features of the Digitized Information Board with SMS-Based customized and developed for Information System used in Information Technology Department. This study was limited only in developing a database-driven scheduling and inquiry system. Lastly, the data were gathered to know the effectiveness and efficiency of the development based on the evaluations of the users.

Research Design

This study used the experimental and descriptive utilize research designs wherein some necessary data were gathered through an adapted questionnaire to assess and evaluate the performance of the developed system. It was limited only on the development and customization of the system tested and implemented in Information Technology Department in SLSU-Toms Oppus. An object-oriented program was generated with the use of Visual Basic, PHP and Database Management Software in order to produce a Smart Information Board with SMS-Based Information System of Information Technology Department.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Research Respondents and Sampling Procedure

The research respondents of this study were the faculty, the staff and the students of Southern Leyte State University- Tomas Oppus Information Technology Department. The faculty and staff were included as respondents using complete enumeration method. All IT students were used with one hundred percent (100%) of the population of each course. Table 1 below shows the distribution of respondents of the study.

Table 1: Distribution of Respondents

Respondents	Population Size	Number of Respondents	Percentage (%)
Faculty	4	4	2.94%
Staff	1	1	0.74%
BS Info. Tech. 1st year	32	32	23.53%
BS Info. Tech. 2nd year	53	53	38.97%
BS Info. Tech. 3rd year	24	24	17.65%
BS Info. Tech. 4th year	22	22	16.18%
TOTAL	136	136	100.00

Table 1 above shows the distribution of respondents of the study. As presented in Table 1, there are 4 faculty-respondents, and only one staff and 136 BS Information Technology students.

Research Instruments

This study utilized an adapted questionnaire from Itchel Figura (2015), Efren Balaba (2012), CCSIT IT department Software Evaluation (2016) and Gilbert David (2012) as the main instrument for data collection. Based from the statement of the problems, the questions were based. All items in the questionnaires' items were carefully examined in order to answer the sub-problems.

The questionnaire which was answered by the staff, faculty and students contained 5 parts. Part I questions focused on the Accuracy and Availability of the information's in the developed system. Part II evaluated the Efficiency of the developed system. Part III assessed the

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Effectiveness of the developed system. Part IV questions focused on Problems Encountered in the developed system. Part V focused on the Support of the developed System in the implementation. The scale was utilized to rate the performance of the development system.

Data Gathering Procedure

The researcher secured a written approval for the conduct of the distribution of questionnaire to the respondents. A seminar was conducted to introduce the system features to the users. After the seminar orientation, there was system hands-on and testing of the users. All the 136 respondents were given questionnaire in order to gather the data pertinent to this paper after using the developed system to know the effectiveness of the system. The respondents' answers were collected, tabulated, analysed, and interpreted.

Data Analysis Procedure

Data gathered were analysed using appropriate statistical analysis and were organized and analysed by means of a measure of central tendency specifically the mode. Mode is the appropriate statistical tool used since the type of data is non-numeric in nature (categorical).

RESULTS AND DISCUSSION

The data gathered were the following: 1.) Accuracy and Availability of the information's in the developed system, 2.) Efficiency of the Developed system, 3.) Effectiveness of the Developed system, 4.) Problems Encountered in the develop system, 5.) Support of the Developed System in the implementation.

Performance of the developed System in terms of Accuracy and Availability

This part presents the Accuracy and Availability of the information's in the developed system. Table 2 summarizes the results of the performance of the developed system in terms of accuracy and availability.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Table 2: Accuracy and Availability of the information's in the developed system

Level of Performance in Accuracy and Availability	Mode	Interpretation
1. Inquiring the availability of announcements and other necessary information's like instructor locator.	4	Very Accurate
2. Interpreting the available information's availability inquiry.	4	Very Accurate
3. Searching the inquire information's.	4	Very Accurate
4. Providing the status of information/announcements being posted.	4	Very Accurate
5. Sending to the students, teachers and staff of the inquiring documents via SMS and in Digitized Board.	4	Very Accurate
6. Searching the available information's.	4	Very Accurate
7. Viewing the contents of the information's being posted.	4	Very Accurate
Overall Results:	**4**	**Very Accurate**

Table 2 shows the performance of the newly developed system as perceived by the respondents of this study. The assessment of the newly developed system in terms of Level of Performance in Accuracy and Availability was interpreted as **Very Accurate** which is mode of 4. It depicts that upon evaluating the results of the respondents it showed that the developed system complied with the needs of the respondents which is to provide accurate and available performance which manual system does not have. The developed system provided accurate information, searching available announcements, provide the status of the announcements and SMS capabilities were executed which majority of the respondents responded with the mode of 4.

Generally the level of performance of the developed system in terms of Accuracy and Availability is evaluated to be **Very Accurate**.

Efficiency of the Developed system

This section summarizes the Efficiency of the developed system. The respondents evaluated as to its performance in terms if efficiency.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Table 3: Efficiency of the Developed system

Information dissemination's via Digitized board and in SMS-Based.	**Mode**	**Interpretation**
1. The new system can show the information's posted of the time of entry.	4	Very Efficient
2. The new system can show the records of the expiration time of information being posted via SMS and administrator.	4	Very Efficient
3. The new system can show the purpose of the data posted.	4	Very Efficient
4. The system can show the name of the persons responsible in posting the information's.	4	Very Efficient
5. Records can now be accessed via SMS any time by the authorized party.	4	Very Efficient
6. The information/details posted in the systems database are complete.	4	Very Efficient
7. Records can be accessed simultaneously via SMS and in Digitized Information Board.	4	Very Efficient
8. Records are all intact.	4	Very Efficient
Overall Results:	**4**	**Very Efficient**

Table 3 shows the efficiency of the newly developed system as perceived by the respondents of this study. The assessment of the newly developed system in terms of efficiency of the developed system was interpreted as **Very Efficient** which is mode of 4. It implies that the system is very efficient to the users as well to the department in showing information details upon posting, synchronization in digitized and SMS, and authorized persons. It showed that records are complete which provide more efficient way in searching and notifying information to the users.

Thus, the level of performance of the developed system in terms of efficiency is evaluated to be **Very Efficient** based on the mode response on the data gathered. It shows that it is preferable to use the developed system as it meet the demands of the users and satisfies the expectation of the users than the current system.

Effectiveness of the Developed system

This part summarizes the Effectiveness of the Developed system. The respondents evaluated the system as to its performance in terms of effectiveness.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Table 4: Effectiveness of the Developed system

Information dissemination's via Digitized board and in SMS-Based.	**Mode**	**Interpretation**
1. The new system can show the information's posted of the time of entry.	4	Very Effective
2. The new system can show the records of the expiration time of information being posted via SMS and administrator.	4	Very Effective
3. The new system can show the purpose of the data posted.	4	Very Effective
4. The system can show the name of the persons responsible in posting the information's.	4	Very Effective
5. Records can now be accessed via SMS any time by the authorized party.	4	Very Effective
6. The information/details posted in the systems database are complete.	4	Very Effective
7. Records can be accessed simultaneously via SMS and in Digitized Information Board.	4	Very Effective
8. Records are all intact.	4	Very Effective
Overall Results:	**4**	**Very Effective**

Table 3 shows the efficiency of the newly developed system as perceived by the respondents of this study. The assessment of the newly developed system in terms of efficiency of the developed system was interpreted as **Very Effective** which is mode of 4. It implies that the system is very efficient to the users as well to the department in showing information details upon posting, synchronization digitized and SMS and authorized persons. It also showed that records are complete which provide more efficient way in searching and notifying information to the users.

Thus, the level of performance of the developed system in terms of efficiency is evaluated to be **Very Effective** based on the mode response on the data gathered. It shows that it is preferable to use the developed system as it meet the demands of the users and satisfies the expectation of the users than the current system.

Problems Encountered in the develop system

This part contains the problems encountered by the respondents in using and observing the developed system. It shows the mode and interpretation of the respondents' answers of the problem listed.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Table 5: Problems Encountered in the develop system

Problems encountered: Information posting, dissemination and inquiry	Mode	Interpretation
1. Cannot show the information's being posted.	1	Not Serious
2. Cannot show the time and dates of announcements.	1	Not Serious
3. Somebody will operate to view the posted information.	1	Not Serious
4. The system cannot show the authorized person responsible in posting the information's.	1	Not Serious
5. The records cannot be accessed via SMS through inquiry.	1	Not Serious
6. The records cannot be accessed via Digitized Board.	1	Not Serious
7. The Digitized Board cannot show instructors availability and schedules.	1	Not Serious
8. The develop system cannot reply inquiries via SMS.	1	Not Serious
9. Delay of SMS notifications.	1	Not Serious
Overall Results:	**1**	**Not Serious**

Table 5 depicts the problems encountered by the respondents of the newly developed Digitized Information Board with SMS. Respondents agreed that during the testing phase, bugs and errors were comprehensively exposed which made the system a failure – free somehow. The systems implied that it was error free as perceived by the respondents results in terms of showing information, records accessibility in digitized board and in SMS messaging, inquiry and time management. The mode result of 4 which majority of the respondents agreed that the system was evaluated as **Not Serious**. Thus, the overall testing on the problems encountered of the developed system in the testing and detecting of errors is **Not Serious**.

Support of the Developed System in the implementation

This part presents the Support of the Developed System in the implementation. Table 6 summarizes the results based from the responses of the respondents with corresponding interpretation.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Table 6: Support of the Developed System in the implementation

Support Services in the implementation	Mode	Interpretation
1. The system able to print or computer materials explain the content and effective use of the program to local site coordinators and users. (Program's brief description and features.)	5	Outstanding
2. Orientation on the appropriate and effective use of the program is provided.	5	Outstanding
3. On-site technical assistance is available during the deployment period.	5	Outstanding
4. Evaluation of the program's effectiveness and efficiency are available to the site coordinators and users.	5	Outstanding
Overall Results:	**5**	**Outstanding**

Table 6 depicts the overall mode result where majority of the respondents responded that the developed system is **Outstanding** with the mode of 4 in terms of printing reports, on site coordinator, orientation and evaluation. The developed system complied all the necessary requirements of the respondents upon the implementation phase as perceived by the study of Russel Kay (2002), that SDLC last phase is support phase which emphasizes the need to go back and reiterate earlier stages a number of times as the project progresses and deals with huge system. This was essentials for the maintainability purposes which the developed system complied. Thus the overall performance on the Support of the Developed System in the implementation is **Outstanding**.

ARCHITECTURAL LAYOUT

The architectural layout shown in Figure 6 briefly explains how the system works entirely in the department

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Figure 6: Architectural Layout

The system utilized the SMS technology as one of the medium in disseminating announcements to students as well as responding inquiry. The digital board served as the kiosk for everybody were they can the different information's being posted and other necessary information that students and other concern individual needs. All data that are being presented are saved in the database. The developed system guaranteed to make accurate announcements, fast and reliable response of queries.

Interface Design

A user-friendly program was developed to satisfy the user's requirements. With PHP and Visual Basic, the researchers present new mechanism in disseminating information viewed in digital board and responding queries through SMS messaging.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

PHP

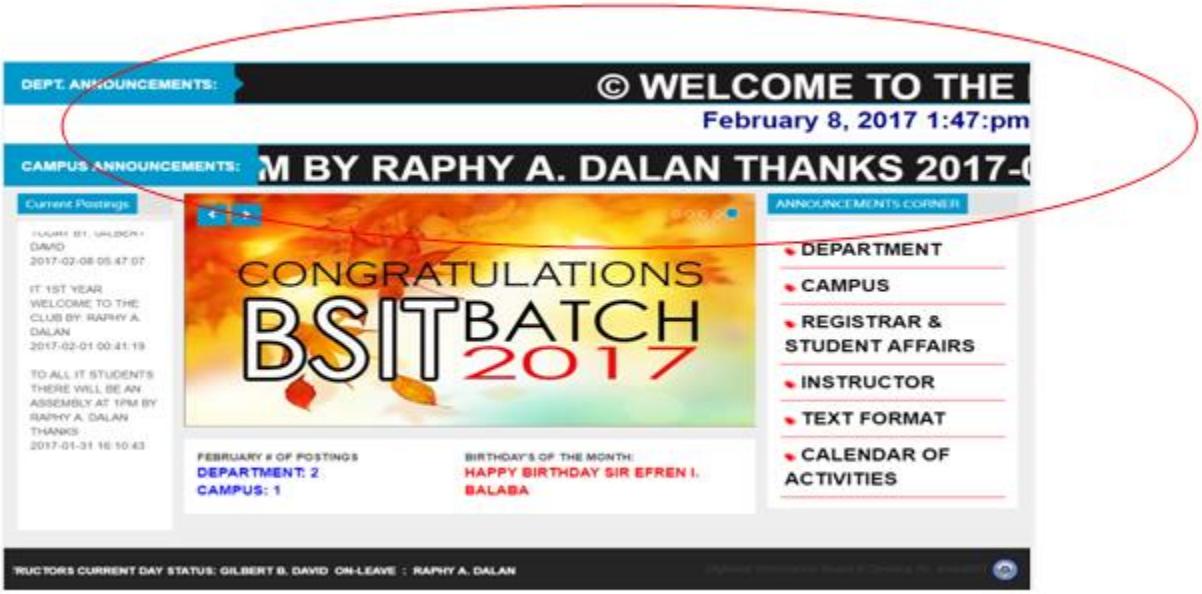

Figure 7: Interface Design for the Digital Board

Digital Board Interface. This displays the different monthly announcements of the department and campus announcements.

Figure 8: Current Department and Campus Postings and Clickable Options

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Current Postings. Figure 8 shows the current department and campus latest postings of announcements. It also offers clickable options for the different announcements as part of its features.

Figure 9: Interface Design for the Instructors page

Instructor's Page. One of the major clickable options of the digital board reflects the instructor's schedules.

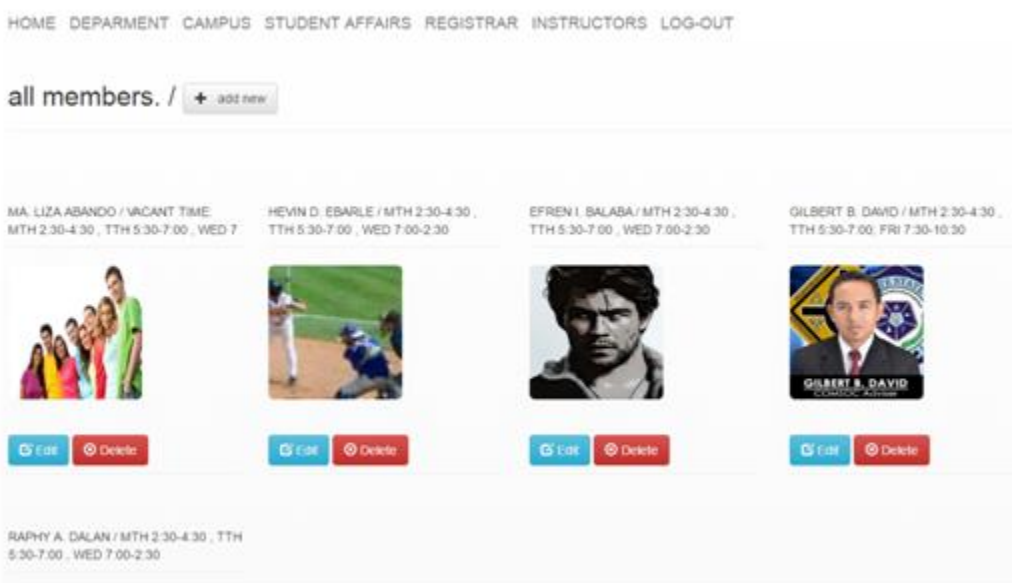

Figure 10: Administrator Page

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Administrator Page. This displays the full control of digital board where saving, searching, deleting and updating of information are done. It requires security to login the administrator page.

Visual Basic

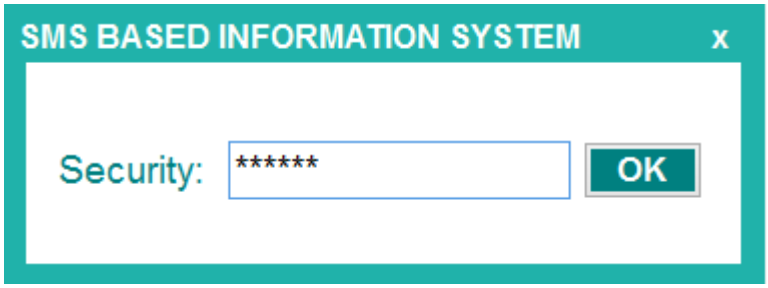

Figure 11: Security form

Security form. The system requires code of the administrator for security purposes. Only the administrator can access the system.

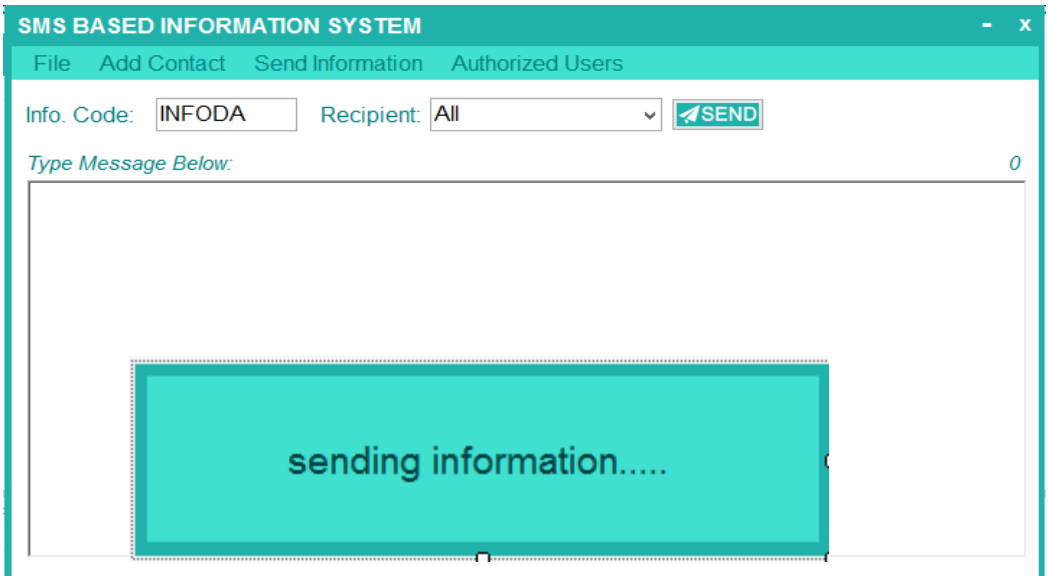

Figure 12: Administrator page

Administrator Page. This displays the full control of SMS Information System were saving, searching, deleting and updating of information's done using SMS. It requires security to login the administrator page. The posted information will automatically sent to the registered student and other concerns.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

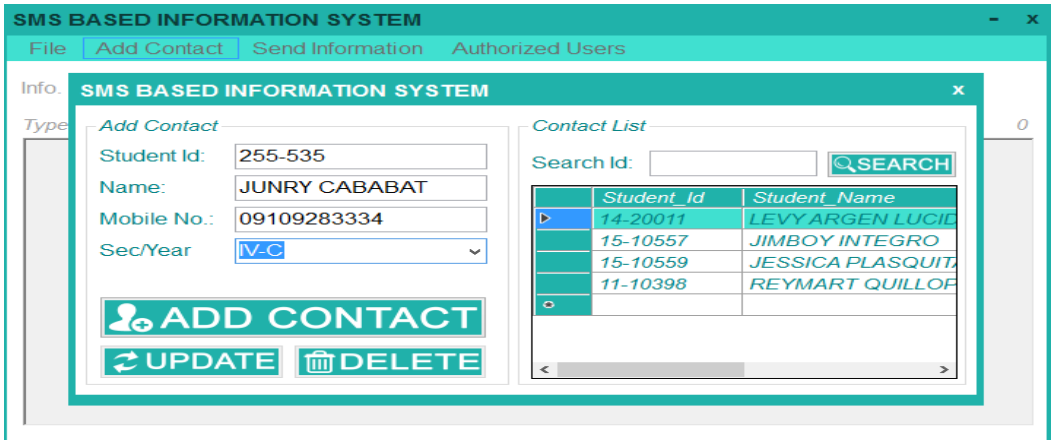

Figure 13: Students Information Form

Student Information Form. The system requires the information of the students as well as the cell phone number for notification purposes. It offers adding, update and deleting information's.

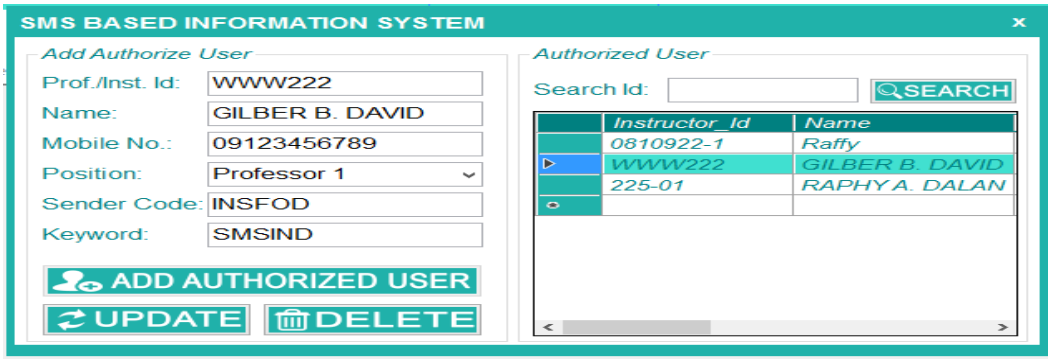

Figure 14: Instructors Information Form

Instructors Information Form. The system requires the information of the Instructors and other concern individuals in the department as well as the cell phone number for posting information purposes. It offers adding, update and deleting information's.

CONCLUSION

Based on the summary and findings of the study, the researchers concluded that the developed system is very useful to the department with very effective and efficient features. The researcher and the respondents believed that having a Digitized Information Board with SMS-Based Information System with the incorporation of the desired features of a good system will resolve the problems of the users in the department. The developed system is capable of posting different

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

information in the campus with SMS notification, instructor's availability, schedules and other concerned offices announcements. The researchers further concluded that implementing this developed system will be beneficial to the department, to the concerned individuals, to the university and to the offices outside the campus in which the system was tested.

RECOMMENDATIONS

Based on the abovementioned findings and conclusions, the following recommendations are offered:

1. With the good features of the developed system, the different departments and offices of the campus should utilize it to replace the manual bulletin board.
2. The developed system may use Touch Screen Board for the convenient of the users.
3. An amount of load per month for SMS purposed should be consider in the department.
4. The other departments inside and outside of the university may adopt this develop system.

REFERENCES

Ahmed, E. et. Al (2014) Information Dissemination through SMS among IT Students, Masjid Tanah Community College. India

Anthony P. van den et.al (1994) Bulletin board resource for communication system access, USA

Bos R. ,et. Al (2009) "SMS and Interactivity - Some Results from the Field, and its Implications on Effective Uses of Mobile Technologies in Education, Vaxjo, Sweden

Brown, D. (2012) An SMS-Based Student Response System. Rhodes University, Grahamstown, South Africa

Butad, Ivy T. et.al. (2010) Development of Computerized File Management System for Loyola Plans Consolidated, Inc.-Maasin City. Southern Leyte State University, Sogod, Southern Leyte.

Certo, Samuel C. (2008) Supervision Concepts and Skill-Building 6e. New York: The McGraw-Hill Companies Inc. \

Elizabeth F. Churchill et.al (2003) Multimedia Fliers: Information Sharing with Digital Community Bulletin Boards, CA, USA

Gore, Marvin et. Al. (1998) Contemporary Systems Analysis. New York: The McGraw-Hill Companies Inc.

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

Gove, Philip B. (2015) Webster's Third New International Dictionary. U. Merriam-Webster Incorporated.

Jaiswal, P. (2011) SMS Based Information System. University of Eastern Finland

James, M. et.al.(2009) A survey of SMS based Information Systems. North Maharashtra University, Jalgaon, MS, India

O'Brien, James A. (2006) Management Information Systems. New York: The McGraw-Hill Companies Inc.

Stevenson, William J. Production (1990)/ Operations Management. Japan: Richard D. Irwin, Inc.

Lee M, J. et.al (2014) Technology acceptance model for wireless Internet. Japan

Lu, J. et.al (2005) Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. Japan,

Michael L. James, et.al (2009) An exploratory study of the perceived benefits of electronic bulletin board use and their impact on other communication activities , Pages 30-50 | Published online: 18 May 2009

Roger W. Morrell et.al (2010) Effects of Age and Instructions on Teaching Older

Adults To Use Eldercomm, An Electronic Bulletin Board System Pages 221-235 | Published online: 11 Nov 2010

Robert A. Koch (2005) Systems and methods for remote access to a display-based bulletin board in a shared user environment, USA

Robert S. Weisskirch et.al (2003) Virtual discussion: Understanding college students' electronic bulletin board use , The Internet and Higher Education , Volume 6, Issue 3, 3rd Quarter 2003, Pages 215–225

Satoru Kikugawa (2002) Electronic bulletin board system, USA

Sheizaf Rafaeli (2015). The Electronic Bulletin Board: A Computer-Driven Mass Medium , Social Sciences, Interdisciplinary 15 out of 93 | Information Science & Library Science 24 out of 86

Yoichi Miyazawa (2002), Electronic bulletin board and bulletin board system, USA

https://www.cise.ufl.edu/~prabhat/Teaching/IISc-systems.html

ISSN: 2455-8834

Volume:03, Issue:02 "February 2018"

http://cs.joensuu.fi/sipu/2011_MSc_Jaiswal_Pankaj.pdf

http://digitalsignage.ph/

https://www.researchgate.net/publication/269308706_Embedded_system_for_home_automation_using_SMS

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC226034/

http://www.themarlincompany.com/products/electronic-display-boards

http://www.scitechnol.com/computer-engineering/articles-on-embedded-systems.php

http://www.scitechnol.com/information-technology/current-research-in-database-management-systems.php

https://www.techopedia.com/definition/22193/software-development-life-cycle-sdlc

https://www.techopmessage-service edia.com/definition/24275/short---sms

http://www.gsma.com/aboutus/gsm-technology/gsm

http://searchsqlserver.techtarget.com/definition/database

http://encyclopedia2.thefreedictionary.com/integrated+system

https://www.britannica.com/technology/database

https://www.britannica.com/topic/information-system

