Automated Class Scheduling System

JERALYN M. GAMALE
EDWARD C. ANUTA
ZINA D. SAYSON
mar_m_a@hotmail.com
Bohol Island State University, Main Campus
C.P.G. Avenue, Tagbilaran City, Bohol, Philippines

Abstract - The study tested the functionality of Automated Class Scheduling System in terms of speed, data handling, accuracy, security, stability and adaptability in making class schedules. This study was conducted in Bohol Island State University Main Campus, Tagbilaran City during the second semester of school year 2010-2011. The respondents of this study were the 6 expert instructors in the field of computer programming. They tested and evaluated the functionality of the program in terms of its design, accuracy, data handling, security, stability and adaptability. Another 8 instructors who are in charge of making class schedules determined the functionality of the system in terms of speed, accuracy, data handling, stability and adaptability of the software. Separate set of questionnaires were given to two groups of respondents. The study concluded that the manual and the automated class scheduling systems are both functional. However, the automated system is more functional because of its extra features which solve the primary problems in creating class schedules.

Keywords - class scheduling system, scheduling software, automated class schedule

INTRODUCTION

One of the remarkable and much known products of technology advancement is the conversion of manually-operated system into automated system. Automation produces a great impact in the lives of man, particularly in the field of industry, business, medicine, and education.

Bohol Island State University Main Campus as an educational institution offers services to the clientele more particularly the students, community and stakeholders. The primary operations of the school are non-stop starting from pre-enrolment up to the post-graduation activities. These activities require money, labor force and time.

It is a fact that arranging class schedules, instructor's load and room utilization for the students and faculty in every department is one of the many activities that each department heads must prepare before classes start. But the school used the manual way of preparing the class schedule. With the manual system, more time and labor force is required to plot, arrange, and revise the class schedules, room utilization and instructors' load provided by the department heads.

With these problems, the researchers had come up an idea of creating an automated class scheduling system using MySQL database and PHP programming language. Through this advancement, errors in operations have been minimized and time and manpower have been conserved.

OBJECTIVES OF THE STUDY

This study aims to design an automated class scheduling system and test its functionality in terms of speed, accuracy, data handling, security, stability and adaptability in making class schedules. This study was conducted in Bohol Island State University Main Campus, Tagbilaran City during the second semester of school year 2010-2011.
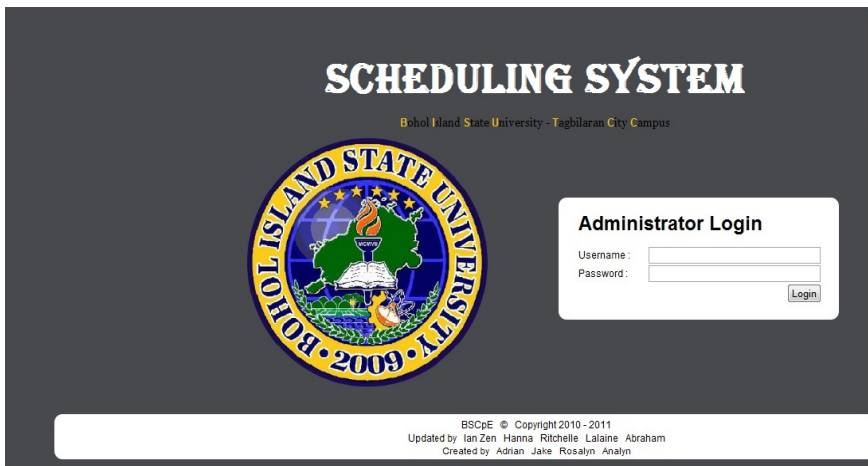
MATERIALS AND METHODS

1. Resources

MySQL Database was used for the database of the program. It was being incorporated with PHP and HTML programming languages for the Graphic User Interface.

2. Hardware and Software Requirements

The program can be installed in a Windows operating system or higher. A physical memory requirement of at least 512 MB memory with at least 20 MB of free disk space is also required.

3. Operating Procedures

Figure 1.Administrator log-in form

This is the administrator login form. Before the administrator can login, he must enter the username and password which are predefined or preset in the system's database. After the administrator has login, he can add another user of the system in the Users tab and have an equal power with him as administrator.
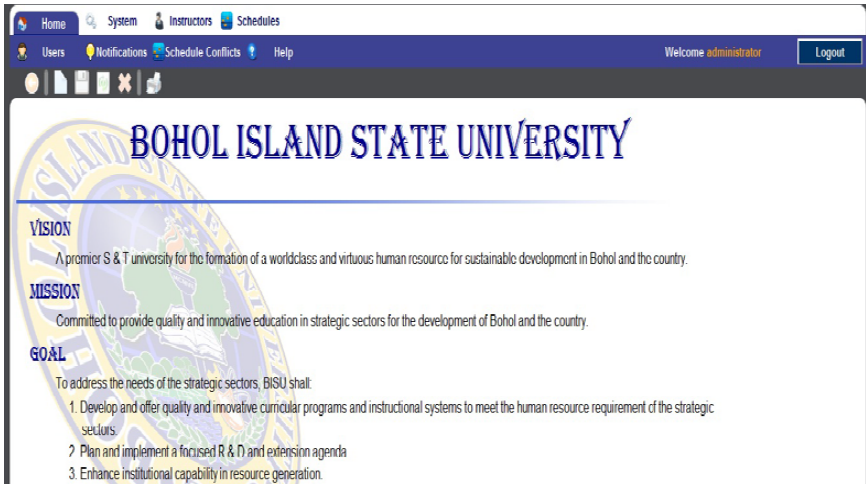
Figure 2. Home page

Figure 2 is the Home page. After the administrator has login, this page appears. Accessibility to all the other tabs which corresponds to the different pages of the system, such as the system tab, instructor tab, students tab, schedules tab, users tab, notifications tab, schedule conflicts, and help tab starts here.

Figure 3. Instructors schedule

Figure 3 shows the schedule of the instructor. This schedule is based on the schedule made in the Section Tab. All the subjects handled by the instructor will be displayed here with their corresponding units. The time and the room that the instructor conduct his class will also be displayed. The schedules displayed in this page is already conflict-free.

Figure 4. Room schedule

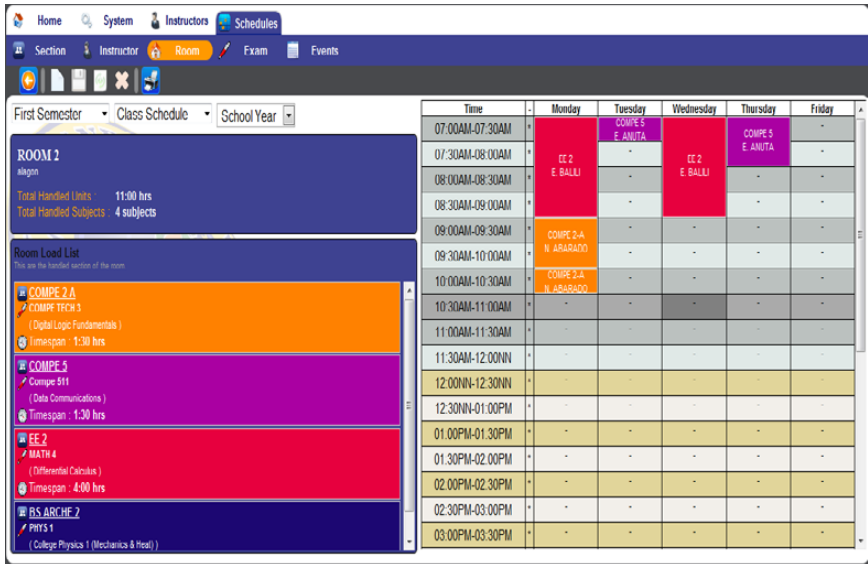This page helps one to view the schedule of different rooms. The instructors who are handling specific subjects on certain rooms are listed. One cannot create, edit or update the schedule except for the one in charge to make the schedule. This schedule is based on the schedules of the instructors and the section. The room schedule is automatically created with the section and instructors' schedule.
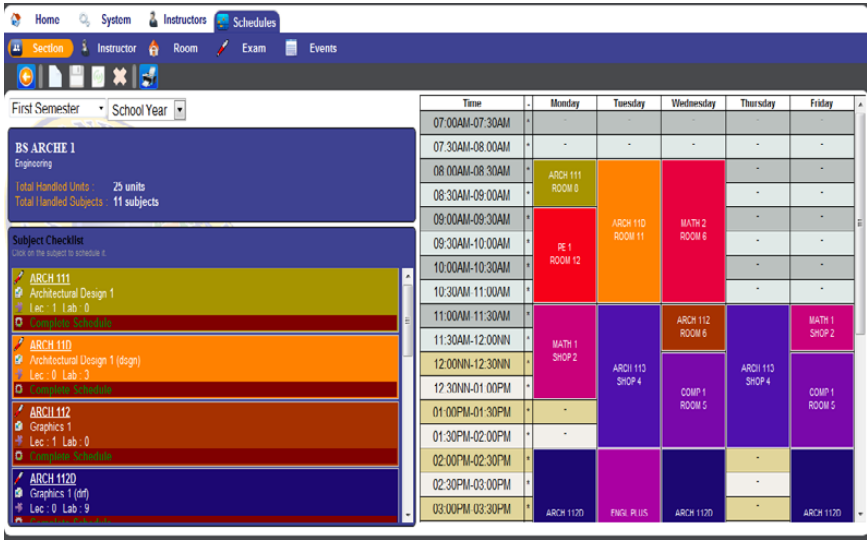
Figure 5. Section schedules

Figure 5 shows the section schedules wherein can create, edit or update schedule of the selected section of classes. The black-colored boxes that appear in the schedule side represent the conflicting data either a conflict with the room to be used or with the instructor who is handling the subject. If the back tab is clicked, schedule that has no conflicts between the room and the instructors will be displayed. Thus the schedule presented provides final accommodation of room and final assignment of instructor.

Operations Manual

After a correct user name and password has been entered into the system, the user can perform any of the functions that follow:

Adding a New User. Go to the 'Home' then click on the 'User' button and click the 'New User' to add a new user. Fill up the required details for the new user and save.

Edit the User Details. Go to the 'Home' then click on the 'User'

button and click the user you want to update. Fill up the new details for the user and save.

Remove a User. Go to the 'Home' then click on the 'User' button and click the user you want to remove. Click the 'Delete User' button, a confirmation box will pop-up and click 'Proceed' to remove the user.

Adding a New Course. Go to the 'System', viewing the course tab as default and click the 'New Course' to add a new course. Fill up the required details and save.

Update a Course. Go to the 'System', viewing the course tab as default and click the 'Course' you want to update. Fill up the new details for the course and save.

Remove a Course. Go to the 'System', viewing the course tab as default and click the 'Course' you want to remove. Click the 'Delete Course' button, a confirmation box will pop-up and click 'Proceed' to remove the course.

Adding a New Section. Go to the 'System', viewing the course tab as default and click the course where you want to add a new section. Click the 'New Section' button to add a new section under the course selected. Fill up the required details for the new section and save.

Update a Section. Go to the 'System', viewing the course tab as default and click the course where you want to update a section. Click the section that you want to update under the course selected. Fill up the new details for the section and save.

Remove a Section. Go to the 'System', viewing the course tab as default and click the course where you want to remove a section. Click the section that you want to remove under the course selected. Click the 'Delete Section' button, a confirmation box will pop-up and click 'Proceed' to remove the section.

Adding a New Department. Go to the 'System', viewing the course

tab as default and click on any courses displayed. Viewing the course details, click on the word 'Department' to view the department list. Click the 'New Department' button to add a new department. Fill up the required details for the new department and save.

Update a Department. Go to the 'System', viewing the course tab as default and click on any courses displayed. Viewing the course details, click on the word 'Department' to view the department list. Click the department that you want to update. Fill up the new details for the department and save.

Remove a Department. Go to the 'System', viewing the course tab as default and click on any courses displayed. Viewing the course details, click on the word 'Department' to view the department list. Click the department that you want to be removed. Click the 'Delete Department' button, a confirmation box will pop-up and click 'Proceed' to remove the department.

Adding a New Subject. Go to the 'System' and click on the 'Subject' tab to view the subject list. Click the 'New Subject' to add a new subject. Fill up the required details for the new subject and save.

Update a Subject. Go to the 'System' and click on the 'Subject' tab to view the subject list. Click the subject that you want to update. Fill up the new details for the subject and save.

Remove a Subject. Go to the 'System' and click on the 'Subject' tab to view the subject list. Click the subject that you want to be removed. Click the 'Delete Subject' button, a confirmation box will pop-up and click 'Proceed' to remove the subject.

Adding a New Room. Go to the 'System' and click on the 'Room' tab to view the room list. Click the 'New Room' to add a new room. Fill up the required details for the new room and save.

Update a Room. Go to the 'System' and click on the 'Room' tab to view the room list. Click the room that you want to update. Fill up the

new details for the room and save.

Remove a Room. Go to the 'System' and click on the 'Room' tab to view the room list. Click the room that you want to be removed. Click the 'Delete room' button, a confirmation box will pop-up and click 'Proceed' to remove the room.

Adding a New Building.. Go to the 'System' and click on the 'Room' tab to view the room list. Click on any room in the room list, click on the word 'Building' to view the building list. Click the 'New Building' button to add a new building. Fill up the required details for the new building and save.

Update a Building. Go to the 'System' and click on the 'Room' tab to view the room list. Click on any room in the room list, click on the word 'Building' to view the building list. Click the building that you want to update. Fill up the new details for the building and save.

Remove a Building. Go to the 'System' and click on the 'Room' tab to view the room list. Click on any room in the room list, click on the word 'Building' to view the building list. Click the department that you want to be removed. Click the 'Delete Department' button, a confirmation box will pop-up and click 'Proceed' to remove the department.

Adding a Subject in each Course Go to the 'System' and click on the 'Checklist' tab to view the course list. Select a course where you want to add a new subject. Select the school year to view the semester list. Viewing the semester list, click the 'New Checklist Subject' button to add a subject under the semester selected. Fill up the required details for the subjects and save.

Update a Subject in each Course Go to the 'System' and click on the 'Checklist' tab to view the course list. Select an course where you want to update a subjects. Select the school year to view the semester list. Viewing the semester list, click the subject that you want to update under the semester selected. Fill up the new details for the subjects and save.

Remove a Subject in each Course. Go to the 'System' and click on the 'Checklist' tab to view the course list. Select an course where you want to remove a subjects. Select the school year to view the semester list. Viewing the semester list, click the subject that you want to remove under the semester selected. Click the 'Delete Checklist Subject' button, a confirmation box will pop-up and click 'Proceed' to remove the subject.

Adding and Information in the Checklist. Go to the 'System' and click on the 'Checklist' tab to view the course list. Click on the 'Information' tab and fill up the required information then save.

Adding a New Instructor. Go to the 'Instructor' to view the instructor list. Click the 'New Instructor' to add a new instructor. Fill up the required details for the new instructor and save.

Update an Instructor. Go to the 'Instructor' to view the instructor list. Click the instructor that you want to update. Fill up the new details for the instructor and save.

Remove an Instructor. Go to the 'Instructor' to view the instructor list. Click the instructor that you want to remove. Click the 'Delete Instructor' button, a confirmation box will pop-up and click 'Proceed' to remove the instructor.

Adding a Class Schedule. Go to the 'Schedule', viewing the section tab as default and click a section that you want to add new class schedule. After selecting a section, now select the semester where you want to add the class schedule. To add a class schedule, click on the subject available below the section detail box. Select an instructor for the subject and a room for the class schedule. Select the time schedule in the time table by highlighting the cell. Click the 'Schedule (Lec)' button for the lecture schedule and 'Schedule (Lab)' for the laboratory schedule. To go back to the subject list click the 'Back' button.

Update a Class Schedule. Go to the 'Schedule', viewing the section tab as default and click a section that you want to update a class

schedule. After selecting a section, now select the semester where you want to update a class schedule. To update a class schedule double-click on the subject in the time table where you want to update. Select a new instructor to change the instructor and a new room for the new schedule. Select a new time schedule in the time table by highlighting a new cell. Click the 'Update (Lec)' to update the lecture schedule and 'Update (Lab)' for the laboratory schedule. To go back to the subject list click the 'Back' button.

Remove a Class Schedule. Go to the 'Schedule', viewing the section tab as default and click a section that you want to remove a class schedule. After selecting a section, now select the semester where you want to remove a class schedule. To remove a class schedule double-click on the subject in the time table where you want to remove. And click the 'Delete' button to remove the schedule. To go back to the subject list click the 'Back' button.

Viewing and Printing an Instructor's Schedule. Go to the 'Schedule' and click the 'Instructor' tab. Showing the instructor list, click on the instructor that you want to view a schedule. Select a semester that you want to view the schedule of the instructor. Select a type of schedule that you want to view. Click the 'Print Schedule' button to have a printout copy of the instructor schedule.

Viewing and Printing a Room Schedule. Go to the 'Schedule' and click the 'Room' tab. Showing the room list, click on the room that you want to view a schedule. Select a semester that you want to view the schedule of the room. Select a type of schedule that you want to view. Click the 'Print Schedule' button to have a printout copy of the room schedule.

Adding an Exam Schedule. Go to the 'Schedule' and click the 'Exam' tab. Click a section that you want to add an exam schedule. After selecting a section, now select the semester where you want to add the exam schedule. To add a exam schedule click on the subject available below the section detail box. Select an instructor for the subject and a room for the class schedule. Select the time schedule

in the time table by highlighting the cell. Click the 'Schedule (Exam)' button for the exam schedule. To go back to the subject list click the 'Back' button.

Update an Exam Schedule. Go to the 'Schedule' and click the 'Exam' tab. Click a section that you want to update an exam schedule. After selecting a section, now select the semester where you want to update a exam schedule. To update a exam schedule double-click on the subject in the time table where you want to update. Select a new instructor to change the instructor and a new room for the new schedule. Select a new time schedule in the time table by highlighting a new cell. Click the 'Update (Exam)' to update the exam schedule. To go back to the subject list click the 'Back' button.

Remove an Exam Schedule. Go to the 'Schedule' and click the 'Exam' tab. Click a section that you want to remove an exam schedule. After selecting a section, now select the semester where you want to remove a exam schedule. To remove a exam schedule double-click on the subject in the time table where you want to remove. And click the 'Delete' button to remove the schedule. To go back to the subject list click the 'Back' button.

RESULTS AND DISCUSSION

The respondents who are in charge of making the class schedules are serving as instructors in the institution for about 5 years and below. The range of the number of years they experienced in making schedules is from 1 to 6 years. From the respondents' data, it was found out that 100% of them experienced conflicting schedules that are hard to check and consumes more materials such as papers, pencils, and others as the topmost problem being encountered during the preparation of their respective class schedules using the manual system.

The expert respondents rated the functionality of the automated class scheduling systems in terms of speed, accuracy, data handling, stability and adaptability as "Very Good". Based on the data gathered from the 8 respondents, the average weighted mean for the functionality of the two systems in terms of speed, accuracy, data handling, stability

and adaptability are shown below:

    a. Automated. The average weighted mean is 3.779 which is described as **"Very Good".**

    b. Manual. The average weighted mean is 2.602 which is described as "**Good**".

The study found out that there is a significant difference between the automated class scheduling system and the manual class scheduling system in terms of their functionality and acceptability level. This is attested with the average weighted mean of 3.19 or Good (based on the experts' perception) and 3.779 or Very Good (based on the respondents' perception) for the automated system and 2.602 or Good (based on the respondents' perception) for the manual system. It was found out there was no single item for the manual class scheduling system that was being rated higher than the automated class scheduling system.

CONCLUSIONS

The manual system is adaptable and useful in the making of class schedules. However, the automated class scheduling system is more functional because of the distinctive performance in the aspect of speed, project design, accuracy and stability of the system in the preparation of class schedules, room schedules and instructors' load. With these features, the automated system can really solve the primary problems being encountered during the class schedule preparation.

RECOMMENDATIONS

1. Add 'School Year' and 'Term' in the database for easy retrieval of data on the specific school year and term being entered by the user.
2. Enhance the code of the program that will improve its aesthetics.
3. It must be used in other campuses of Bohol Island

State University provided that there is an orientation conducted to the end-users on how to operate the system.

LITERATURE CITED

Anderson, D.
2006   Management information systems: Solving business problems
        with information technology. (4th ed.). New York: McGraw-
        Hill Irwin.(http://www.articlecube.com)

ONLINE DATABASES

Scheduling for Group Classes.

http:/www.appointmentquest.com/scheduling/education/group_
        classes Class Scheduling.

http:/www.redicker.com/class_scheduling_software.html Online
        Schedule of Classes.(n.d.).

http:/www.schedule.berkeley.edu/about.html
Employee Scheduling – Online.(n.d.).

http:/whentowork.com
Software.

http://www.plantautomation.com/article.mvc/An-Overview-of-
        Production-Scheduling-Software-0001

http://www.its.qmul.ac.uk/mail/thunderbird/identities.html

http://altmedworld.net/holistic-medicine-course-hmd-program.htm

http://altmedworld.net/membership.htm

http://www.amccindia.com/modeofpayment.aspx

http://www.stepbystep-nursery.net/rooms.htm

http://bearcatbaseball.com/

http://www.hempfieldsoccerclub.org/rptscores.html

http://www.hometeamsonline.com/teams/?u=GRWILSON5&s=lacros
    se&t=c

http://www.finduniversity.ph/universities/bohol-island-state-
    universi...
http://www.htc.com/us/mobile/sprint/hero/02e_Tools.09.4.html

http://www.plantautomation.com/article.mvc/An-Overview-of-
    Production-Scheduling-

http://www.articlecube.com