Development of Co-curriculum Management System

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Abstract—Co-curriculum management in school covers the aspects such as the information regarding the student’s co-curricular activities, their marks as well as the management of clubs exist in the school. In SMK Bandar Utama, the management of co-curriculum is conducted manually. The school staffs such as teachers and clerks will keep all the information regarding the co-curriculum in excel files. In addition to that, the student’s marks are calculated manually by the club advisor. Through this manual system, there are a lot of problems occur because of the poor management in handling the co-curriculum information. Because of that, a system called Co-curriculum Management System is developed to manage all information regarding the co-curriculum of the school. To develop this system, the methodology used is Rational Unified Process (RUP). Other than that, the language of source code and database are also identified in implementing this project. The language of code used are JSP and Java meanwhile the database used is MySQL. Co-curriculum Management System has been tested by several people including developers and also the real users of this system. It is hope that the developed system can help to less the burden of the school staffs and help them make the works become easier.

Keywords-component; co-curricular; management; teachers; student

I. INTRODUCTION

School is a place where people can gain knowledge. Teachers will teach students to make sure they will become a successful person in the future. As known, the main purpose of school is to educate people in every aspect including study in academic, sport, management of organization and many more. But a lot of student were underestimate the important of sport, or can be called as co-curriculum. Every school required all the students to participate in the co-curriculum activities. Co-curriculum is important as part of the requirement for students and also for them to pursue study in university level. Because school is a big community that consists of teachers and students, it needs a system to manage and organize the large data and information of the students especially in the co-curricular aspects.

SMK Bandar Utama is a school established in 1998 where it is located at Damansara, Selangor. This school is one of the government school which has its own organization just like any other ordinary school. The school is consisting of communities such as teachers, students and staffs. Currently, the number of students in the school is 530 students and the number of teachers is 54 peoples. Year by year, the number of students in the school will increase. As the number increase, the school management will face a hard time to manage the data and keep the information in records properly.
For co-curriculum data, SMK Bandar Utama initiate the system themselves by using a fully manual system and keep the data in excel files. There are three types of clubs exist in the school. The three types of clubs are Society, Sport and Uniform Unit. All students are required to join at least 1 club for each category. All the data and processes of marking are conducted manually. Since the processes are inefficient and consuming time, thus a system entitled Co-curriculum Management System is implemented in order to help managing the data in more efficient way.

In this paper, we will get to know more about the system implemented. The things that will be discussed in this paper are the requirements of the system, the details of the process, the result gained from the system and the comparison of the problems before and after the system has been implemented.

II. METHOD

The details and methods used to implement the Co-curriculum Management System are discussed below.

A. Requirement Analysis

Requirements are needed to build an application. The requirements gathering for this system are required through interviews and surveys conducted with the target users which are the teachers and staffs of SMK Bandar Utama.

From the interviews and surveys, researcher get to know the details of the process on how they manage the co-curricular system in the school as well as the requirements needed to implement the system. The requirements gained are visualize in the use case shows in the Figure 1.

B. Choice of Source Code Language

Based on Figure 1, there are three actors that involved in this Co-curriculum Management System and it has a total of 13 functions. The three actors that involved in this system are Admin, Teacher and Parent/Student. The functions involved are Add Club Member, Add New Student, Add Student by Class, Login, Manage Club, Manage Club Member, Manage Profile, Manage User, Update Student Bonus Marks, Update Student Co-Curricular Activities, View Co-curricular Activity Details, View Marks Statistic and Add Comment.

The languages used to implement the system are JavaServer Page (JSP) as front-end language and Java as back-end language. JSP is a language that can create dynamically generated web pages based on HTML, XML and other document types. The dynamic part of JSP is written in Java, thus it is more powerful and easy to use.

Java is a computer programming language that is concurrent, class-based, object oriented and specifically designed to have as few implementation
dependencies as possible. The reason of choosing Java is because it is suitable for any programming task and easy to use and therefore easy to write and compile debug.

Meanwhile, the database management system chosen for this system is MySQL. MySQL is an open source relational Database Management System. There are a lot of large websites that use this database management system including Google, Facebook, Twitter, Youtube and Flickr. The reasons for choosing MySQL are because it is compatible with Java and Java Server Page (JSP) and it is suitable for this system. Another reason to choose MySQL database is because it allows a large capacities of data management. Since the data that need to be recorded are in big amount such as student data, thus MySQL can be use as the platform for this system’s database.

C. System Architectural Design
   The architectural design used to develop Co-curriculum Management System are Model-View-Controller (MVC). There are three kinds of component which model-view-controller design define the interaction between them. The three components are Model, View and Controller.

1) Model Component
   Model component is the business entity where the application operates. This is where all the data-related of the system are presented.

2) View Component
   View component is the user interface of the system. It acts as the communication medium between the system with the user to interact. The files created for view component are in HTML and JSP file.

3) Controller Component
   Controller component acts as the middle layer between model and view. It handles a request from a view and updates the model based on the user behavior. Controller then will interact with view to generate the output representation to the user.

   The benefit of MVC architecture is that it helps to reduce complexity in writing the code because there are separation of request and pages. It is much easier to implement the coding in the proper way based on specification of each part. Figure 2 shows the MVC Architecture Logical Design of Co-curriculum Management System.

III. RESULT
   These are some of the result gained through the implementation of Co-curriculum Management System

A. User Interface
   User interface is a medium that allow interaction between human, which is the user and computer to communicate. The user interface must user friendly and attractive to the user. The TABLE I shows some of the overview of each user interface while the Figure 3 shows the interface of Update Co-Curricular Activities Page.

<table>
<thead>
<tr>
<th>User Interface</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Login</td>
<td>This page allows the user to login into the Co-curriculum Management System.</td>
</tr>
<tr>
<td>Manage Club</td>
<td>This page allows user to manage the club that includes add, update, and delete.</td>
</tr>
<tr>
<td>Manage Club Member</td>
<td>This page allows user to manage the club member including view, update and delete.</td>
</tr>
<tr>
<td>Manage Profile</td>
<td>This page allows user to update their own information and setting their account.</td>
</tr>
<tr>
<td>Manage User</td>
<td>This page allows user to manage the user of the system that includes view, add, update and delete.</td>
</tr>
<tr>
<td>Update Co-Curricular Activities</td>
<td>This page allows user to update the student activities in the club.</td>
</tr>
</tbody>
</table>
**B. Database Design**

Database design is one of the important part in developing an application. The data used in the application must be able to be stored and retrieved whenever a request is made by the user. There are seven tables used in the Co-curriculum Management System. The seven tables used are:

- User Table
- Student Table
- Student Class Table
- Club Table
- KoQ Info Table
- KoQ Marks Table
- LOV Table

Figure 4 shows the database design of Co-curriculum Management System which consists of the class table together with its attributes and methods and also the interaction between the tables in the system.

**C. Black Box Testing**

Black box testing is type of testing to test the functions exist in a system to see if it is run as expected. The expected output has been set to determine to accuracy of the function. Each test case is listed and the tester will record the result of the test. The result then will be compared with the expected output. TABLE II shows the test suit for Add Club function.

<table>
<thead>
<tr>
<th>TESTID</th>
<th>AC001</th>
<th>AC002</th>
<th>AC003</th>
<th>AC004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Club Name</td>
<td>Bahasa</td>
<td>-</td>
<td>Bahasa</td>
<td>Bahasa</td>
</tr>
<tr>
<td>Club Advisor</td>
<td>6209110 12345</td>
<td>6209110 12345</td>
<td>-</td>
<td>6209110 12345</td>
</tr>
<tr>
<td>Click ‘Add’ button</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**D. User Acceptance Testing**

For the User Acceptance Testing (UAT) of Co-curriculum Management System, there are eight participants that were involved. Each two participants will represent as one actor. All participants are required to use the system and perform all the function related. After the participants have finished testing the system, they are required to complete the questionnaire prepared beforehand. Participants are required to rate the usability of the system and also give feedback or suggestion.

After the testing has been conducted, all the answers and feedback were collected. From the result, there are some participants that suggest the improvement of the system to always ask for
confirmation before doing any actions. There is also a participant who ask for the system to display the name of the student when adding he/she to any clubs. Since the function only required user to enter the IC number of the student, the participant suggests that the system display the student details after they entering the student’s IC number before confirming to add the student to the club. Other than that, there is a suggestion to add statistics of student who registered into the system. By adding the features, the system will be more helpful to the end user. Overall, majority of the participants are liking the system and agree that the system is user-friendly. All the feedback and information from the participants were recorded and added into the recommendation for future development.

IV. DISCUSSION

Based on the results produced from the Co-curriculum Management System, there are many aspects to be studied on in order to build a good application. The most important part is the requirements gathering from the target user. A system that is not follow the needs of the user is not considered a success system. Therefore, it is very important gather the requirements at the early stage.

Other than that, comparisons also need to be conducted with other similar existing systems to ensure that the system produced are better and more functional than the others. As mention before, a good system is a system that fulfill the user requirements.

V. CONCLUSION

The objectives of Co-curriculum Management System is to help the organization of school to manage their co-curricular data in more systematic way. It helps the staffs of the school to keep track all the student’s activities and automatically calculate their GPA and CGPA of their co-curricular activities. The analysis and requirements done during the early stage of this project is gained from the public users of this system and it is documented in the Software Requirement Specification (SRS) document. The database entities model of the system is also successfully produced as in the Software Design Document (SDD). After the system has been completely produced, the testing is done to ensure the quality result of the system. The testing consists of two type, the black box testing and the user acceptance testing.

Suggestions and improvements must be made to make the system implemented even better than before. There are several suggestions that can be done to enhance the system in the future. Following are the list of suggestions and recommendation for this system.

- Make a new feature that acts as an inbox for the user so that they can interact with each other easily
- Create a separate account for parents and student so that each user can access the system as it is their own.
- Make a dashboard that can display notices and any latest activities available with its information such as time and venue.
- In the Add Club Member function, after the user has enter the IC number, the system should display the student’s details before adding he/she as the club member.

ACKNOWLEDGMENT

“In the Name of Allah, the Most Beneficent, the Most Merciful”

Alhamdulillah hirobbil ‘alamin, all praises to Allah SWT for giving me a strength and blessing in order to complete my project entitled Co-curriculum Management System.

I would like to express my sincere gratitude to my supervisor, Dr. Zalmiyah Binti Zakaria for her guidance, advice and support throughout the process of completing this project. Without her, I might not be able to finish this project.

I would also like to express my very great appreciation to the SMK Bandar Utama staffs who were very cooperative throughout the development system phases.

Not to forget, I would like to show my appreciation to the most important person in my life, my parents, Mustafa Bin Senin and Mastura Binti Adon, and my family for always support me and keep the positive vibes in my life.

I would also like to extend a huge thanks to my fellow friends who are always there for me and willing to teach and help me whenever I need them. The knowledges that I gained from them are so valuable to me. Thank you.
REFERENCES


