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Web-Based Boarding School Monitoring System

Norsuzila Ya'acob[1], Aziean Mohd Azize[2], Azita Laily Yusof[3], Suzi Seroja Sarnin[4], Nani Fadzlina Naim[5], Siti Norbaiyah Rohaizad[6]
[1,2,4,5,6] Faculty of Electrical Engineering, Universiti Teknologi MARA, 404500 Shah Alam Selangor, Malaysia
Wireless Communication Technology (WiCoT), Faculty of Electrical Engineering, Universiti Teknologi MARA, 404500 Shah Alam Selangor, Malaysia
[3]Universiti Teknikal Malaysia Melaka (UTeM), 76100 Durian Tunggal, Melaka

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ABSTRACT

An alibi is a priceless thing that someone can rely on when in needs. A good data management can and will save someone life in respond to any unwanted situation.A simple, accurate and trustworthy data log for students in boarding school can and will help ease parent-teacher monitoring system. However, the conventional system require student to manually inform and record their log to their parents and teachers. The system is lacks of automation where a number of problem may arise. The problem includes the inaccurate logging time, misplace of outing card and an unorganized log record. Web-Based Boarding School Monitoring System (WEBMOS) Using MySQL Database and RFID Technology were invented to solve this problem. This technology offered a system that can record student log data in an accurate manner. The aim is to build a system that can provide the accurate data to parent and teacher via a single click through their personal device. This system uses RFID module technology to monitor the student's logs activity in real time manner. The monitoring system involve the utilization of Arduino Mega, Ethernet Shield, Global System for Mobile communication (GSM) and Radio Frequency Identification (RFID) Module. The system performs an automated data log after the student flashed their card to RFID reader, the data is uploaded to database after the card being flashed and the uploaded information can be view at the webpage at anywhere and anytime. Thus, thesystem is capable of collecting and recording aprecise real time data logging for student's activity.

Corresponding Author:

Norsuzila Ya'acob,
Faculty of Electrical Engineering,
Universiti Teknologi MARA, 404500 Shah Alam Selangor, Malaysia.
Email: norsuzilayaacob@yahoo.com

1. INTRODUCTION

Today conventional boarding school monitoring system in Malaysia offer a system that uses a manual approach in recording their student log (i.e. by using a log book) [1]. Such approach is inefficient due to the fact that it is lack of automation.Teachers or warden of a boarding school holds the same responsibility as the parent of the students while the students are in their custody. However, it is impossible to keep track of each and every student without the help of a futuristic technology. Technology advancement has increased exponentially which enables human to do almost everything virtually as long as they are connected to the internet. Smart phones, tablets, GPSs, cameras, PDAs and laptops are examples of devices owned by the users. Almost all high-tech devices can connect to the Internet either through a wired or wireless network [2]. The people just need to give the commands using android mobiles [3]. It may seem odd, but it is now possible to monitor students logging activity via a personal device at anywhere and anytime. It is well known that today's system operates manually where leads to numbers of problems [4]. For example, the inaccurate

data collection and management, the delayed of data accessibility and untrusted recorded data. Thus, with the invention of Web-Based Boarding School Monitoring System (WEBMOS) Using MySQL Database and RFID Technology, the conventional system can be replaced and the parent-teacher monitoring system can be easily done.

The WEBMOS featuring RFID technology as the medium to collect the student data log. The students are required to flash their card to the RFID reader upon leaving or entering the school. RFID reader is the device capable of reading and retrieving information that are stored inside the RFID card. The RFID card is divided into two types which are passive and active. The different between this two types arethat the passive RFID does not need power supply to operate, whilean active RFID card need a power supply to operate and to produce a signal [5]. The software part of this project uses Adobe Dreamweaver CS6 software to construct the webpage of the system. The webpage will allow user to have access to the information in tabulation form. The table includes the date, time and details of the student log activity. The log activity that has been collected by the RFID reader is uploaded to MySQL database via an internet connection [6, 7]. PHP programming language is compatible with the MySQL database which makes both PHP language and MySQL database is a perfect combination of the system. These software and database system allow the real-time monitoring activity with and without the internet connection. The system also offers a real-time monitoring system via Short Message Service (SMS) [8]. Use of GSM advancement made the structure remote, less confounding [9]. It offers read only features which prevent the collected data to be altered.Thus, the purpose of this system is to monitor student logging activity through MySQL database and to implement a real-time monitoring system using PHP language and RFID technology. This system promising an accurate and trustworthy data collection activity.

2. RESEARCH METHOD

The boarding school monitoring system is designed to ease both parent and warden to monitor the student's activities. To complete this system, both hardware and software part is needed. The flowchart shown in Figure 1 conclude the whole process of the system.

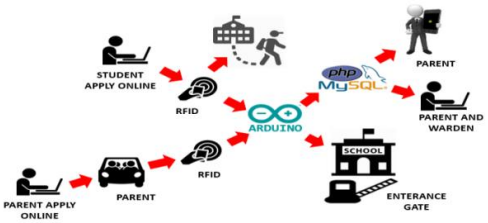

Figure 1. Diagram of the Overall System

The system are designed to serve student, parent and warden accordingly. Firstly, the system needed the student or parent to apply for an application for outing activity or overnight actvity at the website. Next, once the application is successfully submitted, both student and parent will need to wait for a moment befoere receiving a respond from the system wether the application is approvedor rejected. The respond are fully controlled by teacher or warden. If the application is approved, the next phase of the system can be proceed.

For student, the RFID reader will read the student card to collect the data of the logging activities. The data is then transmitted to the databased viaEthernet Shield. After that, the databased that has been created in MySQL manipulator will store the recorded data and the students' parent will get SMS notification alerting the parent about their child log. Then, the recorded data from the database will be fetched by the PHP script that are created using the Adobe Dreamweaver software. The Adobe Dreamweaver will display all thestudent logging activities datain the website on a proper table. Lastly, the web page is displayby using Wamp Server localhost in the on the web browser. Next, if the RFID reader detected the parent card, no data collection will be made, but the enterance gate will be open.

2.1. The Hardware Part of the System

In this section, the hardware part is focusing on the RFID reader with RFID cards and GSM. Figure 2 shows the flowchart for hardware part.

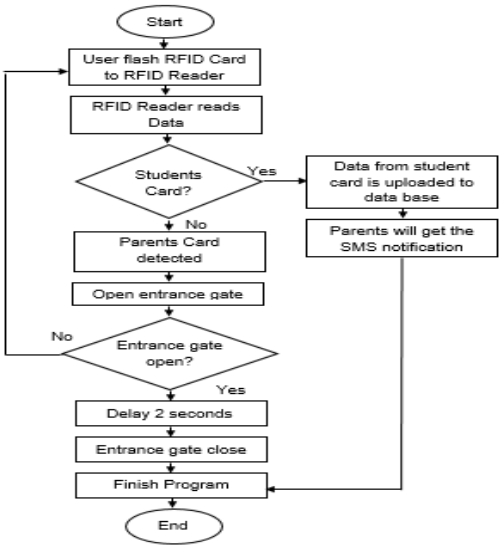

Figure 2. The Flowchart for Hardware Part

Figure 2 describe the flow of the system in hardware part. After the student flashed their card directly towards the RFID reader, real-time data will be uploaded to the database. Their parent will get the SMS notification right after the data is uploaded to the database. However, if the RFID reader read the parent card, only the school entarance gate will be open. If the entarance gate is not open, user need to reflash their card.RFID reader with RFID cards. The RFID reader will read the signal from the cardthat have been interfaced. The parent and student both will have their own card. This system only uses RFID reader and RFID cards. It does not use the RFID tag. Next, the component used is GSM SIM900A. The function of the GSM is to send SMS to the parent once their children card has been flashed.

2.2. The Software Part of the System

This section will describe more about the software part. Figure 3 shows the flowchart of the software part.

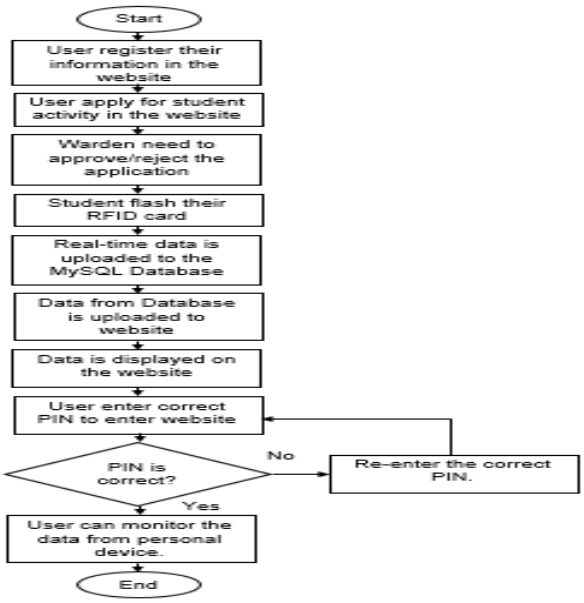

Figure 3. Flowchart for Software Part

Firstly, for a new student, they are needed to register their details in the website. After filling all the information needed and successfully creating an account, they need to enter their registeredemail address and password to enter the webpage. The website is divided into two part which are student page and parent page.Student can only apply online for their outing application while parent can only apply online for their children overnight application. After that, both student and parent need to wait for the approval from the warden. This approval can be check right after the warden approve the application in the website. The software development that has been used in this system is in the process of designing the webpage by using Adobe Dreamweaver software. The databased is required to store the data when the RFID reader read the signal. The MySQL database which is an open database is used for the system. Before the data is uploaded to the webpage, The MySQL database is created using phpMyAdmin open software. After that, there are seven tables were created to keep the different data for overall system such as register form for both parent and student, the application for overnight and outing and the result for the application. The webpage will display the wanted data that has been fetched from the database. This process is done using PHP language.

Next, Adobe Dreamweaver software is used to design the website for overall system. This software is the simplest software compared to others because it can use both visual design and source code [10,11]. The main languange to design the webpage is Hypertex Markup Language (HTML). To design the website in this system, the HTML are neededto combine with the PHP language. After that, the code is save in .php format.This will give the result of the functioning and the complete webpage for the system.The testing server is needed to diplay the webpage in the localhost. In this project, Wamp Server is used as a platfrom to display the webpage. The server is an open source and free cross-platform web server.

The Wamp Server must always put as online status to allow the localhost displays the webpage. The localhost will call the specific file needed for display the webpage in the folder under Wamp Server.

3. RESULTS AND ANALYSIS

In this result and discussion section, in the implementation of WEBMOS at the boarding school, both hardware and software are involved. The system is designed to serve 3 users, which are parents, student and warden. Student and parent will be provided with 2 different cards, where each card have its own unique IDnumber [12, 13]. It begins by the system asking user to choose user interface according to their status. User can choose to enter the system as parents, warden or student by clicking the provided link as shown in Figure 4. However, a valid email address and password are required to be entered before user can have access to each user interface. User will only have a valid email address and password by registering themselves into the system by clicking the register link. The register link is divided into two links which are Parents and Student link as shown in Figure 4 for parents to register, and Warden link as shown in Figure 5 for warden to register. After filling all the required detail in the register form, user must press the submit button to successfully registering into the system. Once user has successfully registered into the system, user may now continue choosing their desired interface link.

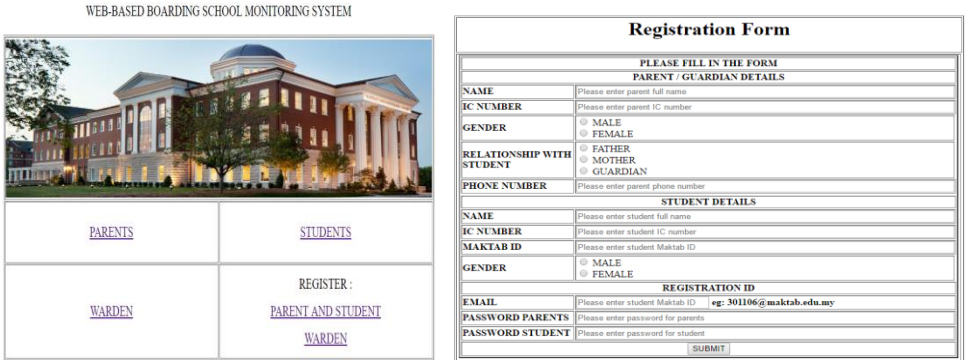

Figure 4. Main Page and Registration Form for Parent and Student

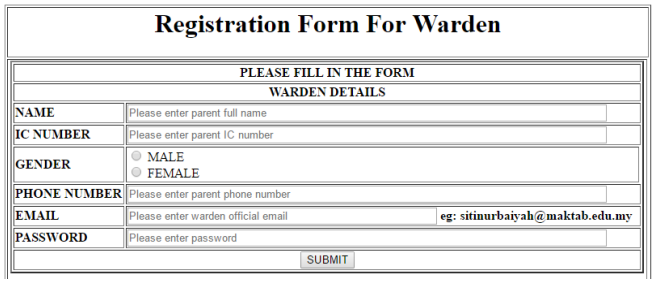

Figure 5. Registration Form for Warden

3.1. Student Interface

By choosing the student link, the system will continue to enter student login page, where user is required to enter the registered email address and password. Once a valid detail is entered, the system will display the student homepage interface as shown in Figure 6. User was given multiple interface links choices where each link will lead to different interface. As acknowledge, the home link will display the homepage of the students' interface.

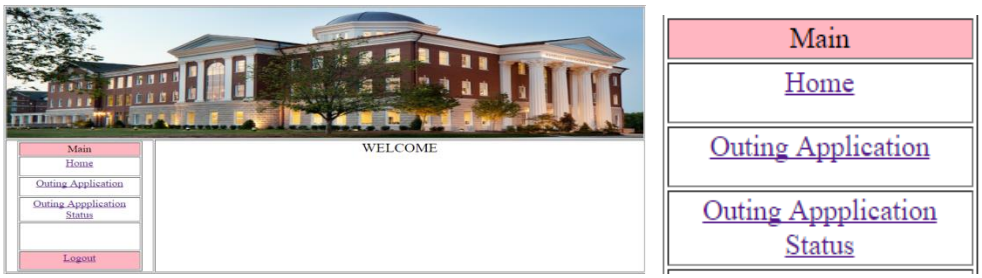

Figure 6. Home Page for Student Interface

Next, the outing application link will display the table form as shown in Figure 7. The form must be filled by student in order to apply for outing activity. This outing activity application is designed to allow student to join school activity that involve outside school area such as sport or school field trip at any necessary time. User must enter the submit button to submit the application. Later, the application status can be view by clicking the outing application status link. The link will display either the status is approved or rejected.

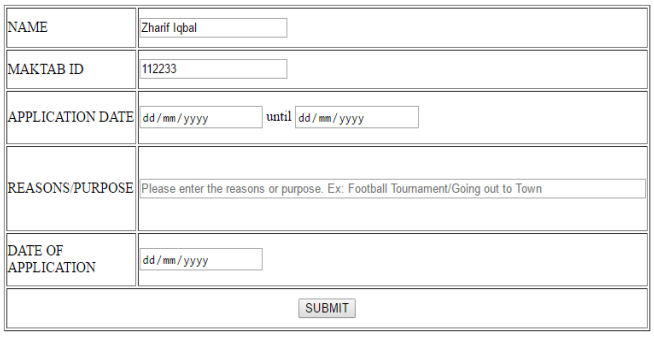

Figure 7. Table Form in Outing Application Link

3.2. Parent Interface

Next, by choosing the parents link, the system will continue to enter parent login page, where user is required to enter the registered email address and password. Once a valid detail is entered, the system will

display the parent homepage interface as shown in Figure 8. User was given multiple interface links, where each link will lead to different interface. As acknowledge, the home link will display the homepage of the parents' interface.

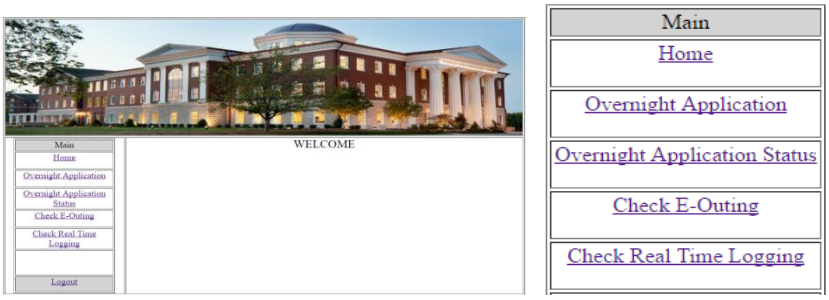

Figure 8. Home Page for Parent Interface and Parent Interface Link Choices

Next, the overnight application link will display the table form as shown in Figure 9. The form must be filled by parent in order to apply for overnight activity for their children. This overnight activity application is designed to allow students' parent to apply for permission for their childto leave school at any needed and necessary time.User must enter the submit button to submit the application.

Figure 9. Table Form in Outing Application Link

After successfully submit an application, user may now click the next link in Figure 10. Which is the overnight application status link. Here, user will be notified regarding the status of the application. The status is either the application is approved or rejected. Next, the Check E-Outing link will display the student outing activity application status as shown in Figure 11. While, the Check Real Time Logging link will display the student's entering and leaving school log in a real time manner as shown in Figure 12. Both links are designed for parents monitoring activity purposes.

No	Application Date	Name	Maktab ID	Reasons	Status
1	2017-05-12 until 2017-05-14	Zharif Iqbal	112233	family matter	Rejected
2	2017-05-26 until 2017-05-27	Zharif Iqbal	112233	wedding cousin	Approved

Figure 10. Application Status in the Overnight Application Status Link

No	Application Date	Name	Maktab ID	Reasons	Status
1	2017-05-12 until 2017-05-12	Zharif Iqbal	112233	going out to town	Approved
2	2017-05-19 until 2017-05-19	Zharif Iqbal	112233	football tournament at Bukit Jalil	Rejected

Figure 11. E-Outing Table

No	Student Name	Maktab ID	Date / Time
1	Zharif Iqbal	112233	14-05-2017 22:19:28
2	Zharif Iqbal	112233	15-05-2017 03:05:03

Figure 12. Real Time Logging Monitoring Activity

Once student flashed their student card to RFID reader, parents will receive SMS notification to notify parents about their child current log activity. Simultaneously, table in Figure 11 will be updated with the current log activity. This table can later be viewed by parents via parents' personal device. Here, the system offers a view only page. No modification of data log is permitted.

Another feature presented by WEBMOS that are specifically designed to ease the process of parents entering the school, which will replace the conventional process are the utilization of parent ID card. Here, parent no longer needed to park their car, register manually at the guardhouse and wait for the guard to open the gate. The parent card will automatically be read by the RFID reader. Once the card has been read, the entrance gate will automatically open for a moment before it is automatically closed again.

3.3. Warden Interface

Lastly, by choosing the warden link, the system will continue to enter warden login page, where user is required to enter the registered email address and password. Once a valid detail is entered, the system will display the warden homepage interface as shown in Figure 13. User is given multiple interface links choices, where each link will lead to different interface. As acknowledge, the home link will display the homepage of the wardens' interface.

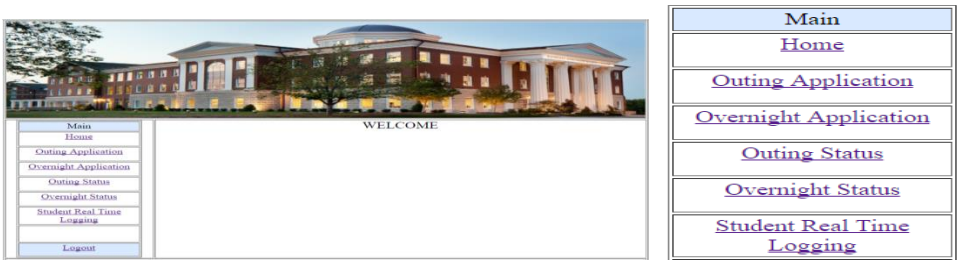

Figure 13. Home Page for Warden Interface and Parent Interface Link Choices

Next, the outing application link will display students' outing application, while the overnight application link will display the parents' overnight application. Here, warden is fully in charged in deciding the applications' status. Warden will consider the application and will respond to the application with "approved" or "rejected" status. The respond for outing activityand overnight activity can be viewed by studentand parent at their interface. Moreover, the outing status, the overnight status link will display the overall application status received as shown in Figure 14 and Figure 15. Lastly, the overall student real time logging data for all student is as recorded in table as shown in Figure 16.

No	Name	Maktab ID	Application Date	Reasons	Status
1	Zharif Iqbal	112233	2017-05-12 until 2017-05-12	going out to town	Approved
2	Zharif Iqbal	112233	2017-05-19 until 2017-05-19	football tournament at Bukit Jalil	Rejected
3	Irdina Safiyya	121212	2017-06-02 until 2017-06-02	going out to town	Approved
4	Irdina Safiyya	121212	2017-06-09 until 2017-06-09	basketball tournament	Rejected

Figure 14. Outing Status Monitoring in Warden Interface

No	Name	Maktab ID	Application Date	Reasons	Status
1	Zharif Iqbal	112233	2017-05-12 until 2017-05-14	family matter	Rejected
2	Zharif Iqbal	112233	2017-05-26 until 2017-05-27	wedding cousin	Approved
3	Irdina Safiyya	121212	2017-05-19 until 2017-05-20	visiting grandparent at hospital	Approved
4	Irdina Safiyya	121212	2017-05-22 until 2017-05-23	emergency family matters	Rejected

Figure 15. Overnight Status Monitoring in Warden Interface

No	Name	Maktab ID	Entering/Leaving Date-Time
1	Zharif Iqbal	112233	14-05-2017 22:19:28
2	Irdina Safiyya	121212	14-05-2017 22:19:43
3	Irdina Safiyya	121212	15-05-2017 03:04:52
4	Zharif Iqbal	112233	15-05-2017 03:05:03

Figure 16. Real Time Logging Monitoring in Warden Interface

4. CONCLUSION

Based on the result of the system, the objectives of the project are successfully achieved. The hardware part gives all the data of the student's logging activities. The SMS is send to the parents of the student right after the student flash his card. After that, the data from the hardware part is transmitted to the database. The entrance gate will automatically open after the parent's card was flashed. For software development, Adobe Dreamweaver and MySQL database is used as the main platform to create the webpage for this project. The monitoring process can be done through the website. This project can ease both parent and warden process to monitor student's logging activities in real time manner. The web-based boarding school monitoring system can replace the conventional system to monitor student's activities which is lack of automation.

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