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Development of an Online Attendance System for Educational Institution

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ABSTRACT

Student attendance plays an important role in academic institute. Most institutions make use of manual means (paper attendance system) in taking attendance which is ineffective, inefficient and not secure enough. Therefore, Academic institutions need a system which is secure and fully responsive. With the current advances in information technology, there are lots of technologies being used in this 21st century. Different software and hardware have been developed in order to save and retrieve data and information in a computerized system. With this new innovation in technology, we are able to develop online attendance system which is web based. This system helps lecturers take students attendance through the developed attendance website and attendance records which is gathered from the website and is stored automatically into the attendance database. It is a web based system which uses student matric numbers as means of taking attendance. Thus, this paper presents the development of an online attendance system for use in educational institutions in Nigeria.

1. Introduction

In any organization system either an academic or non-academic organization system, attendance marking is very important. In the Nigeria academic system, student's attendance is being graded as part of their continuous assessment and a certain percentage of student attendance is required before a student is qualified to write an exam. [1] established in their research that student attendance during learning and other activities such as labs, seminars and workshops correlate positively to student's performance during their undergraduate studies. Students class attendance and engagement plays an important role in today's educational system. Several previous studies have shown that class attendance is an important predictor of academic outcomes, thus, students who attend more classes earn higher final grades [2, 3, 4, 5, 6]. As students make up the bulk of the institution, it is usually a challenge to manage their activities [7]. [8] investigated the relationship between university students' class attendance and learning performance. In their research, student attendance data was collected and analyzed using cluster and regression analysis. The result gotten from their research work classified students in higher institution into three groups which are:
Group one: those who drop out before the final exam
Group two: those who attend classes as well as the exam
Group three: those who study independently and attend the exam.
Their research work emphasis that students in group two achieve academic excellence than students in other groups. It was later stated that students' attendance is positively and significantly relates to student academic performance.

Most academic institute use manual system to mark students' attendance which may seem to have a challenge involving credibility, time consumption and security. With the aid of computer, an online based system is developed which keeps record of student attendance, have easy access of attendance records and provide accurate records of attendances. This system is achieved by developing an online based system which uses students' matriculation number as means of taking student attendances.

It is often difficult for a Lecturer to keep track of large number of student attendance in an institution where paper signing system is used for taking attendance because in the paper signing system, student attendance record can be misplaced. The attendance also needs to be kept safe since it determines whether or not a student will be permitted to write examinations.

To overcome the problems stated above, a secure attendance system is developed. This paper provides a secure means of taking attendance in educational institution.

2. Methodology

2.1 Design Analysis

The design model used to achieve the objectives of this paper is shown in Figure 1. The attendance website is linked to a server which helps to store and fetch data from the attendance database. The website can be accessed by lecturers, students and admin. An admin can also access the attendance database directly without login in to the website.

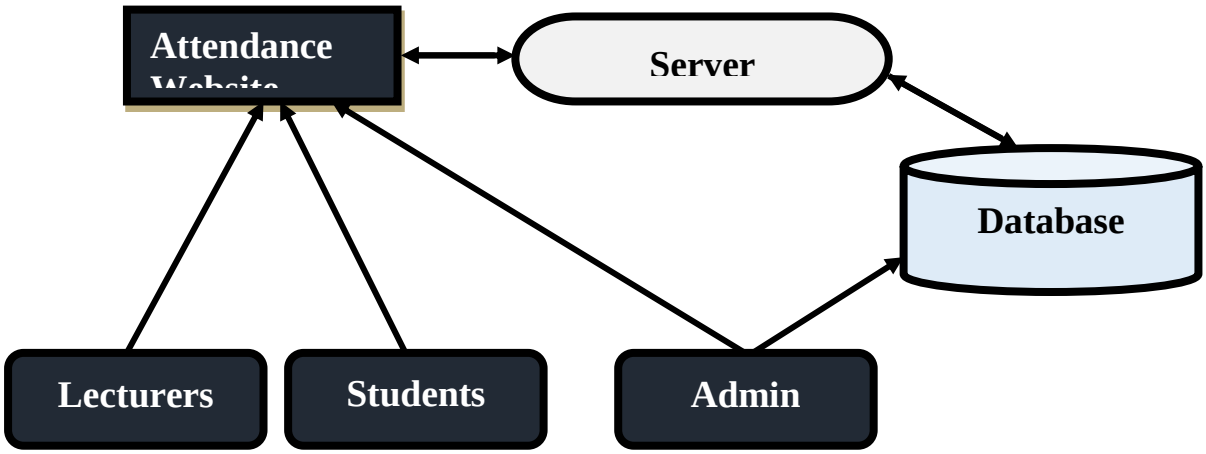

Figure 1: Design Model of the Attendance System

2.2 Selection of Materials

The materials used for the design and implementation of this work are listed as follows;

i. Window 7 operating system
ii. Adobe Dreamweaver 4.0.1
iii. Subline Text
iv. Wamp Server 3.1.3 for x84
v. MySql database
vi. Notepad text editor
vii. FireFox 61.0.2 for x86

2.3 Design Procedure

This system design is basically classified into two. These include: the attendance website design (front end design) and the attendance database design (back end design).

2.3.1 Attendance Website Design

The attendance website is the attendance system interface which can be access by lecturers, students and admin. For the purpose of developing the attendance system website, the following programming language is used: HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), JS (Java script).

HTML was used for the development of the attendance website pages; CSC and Java script are used for the website styling. Basically the website contains eight web pages excluding the home page. The entire pages are linked together in order to make the system more flexible. Figure 2 shows the overall structure of the website designed. The eight pages of the attendance website are;

i. Student registration page
ii. Lecture registration page
iii. Take attendance page
iv. Access attendance page
v. Admin login page
vi. School portal (FEDPOLEL portal)
vii. About the system page
viii. Contact us page

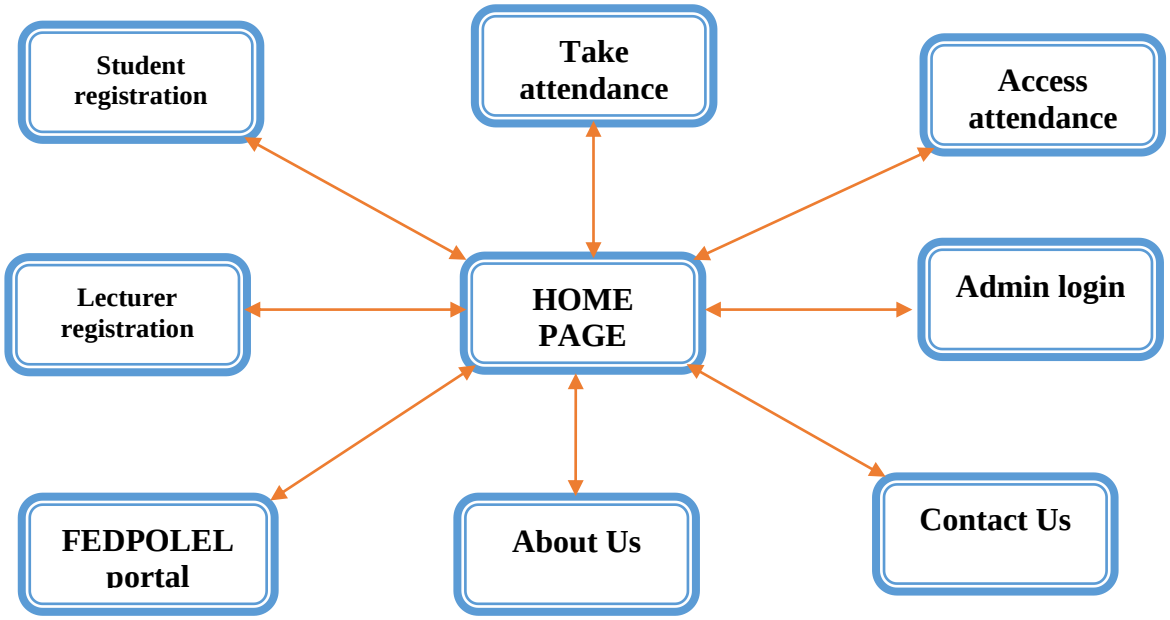

Figure 2: Overall structure of the attendance system website design

2.3.2 Attendance Database Design

The attendance database is where the attendance records generated from the website is stored. The attendance database can only be accessed directly by admin of the system. Attendance database was developed using MySQL (Structured Query Language) codes. WAMP Server is installed to provide a local host server which was used as a server to load the MySQL database. WAMP Server is installed as a software bundle and stands for "Windows, Apache, MySQL, and PHP."WAMP is often used for web development and web internal testing [9]. The created database has six basic tables which stored different records of the attendance system. The six tables created are; admin table, lecturer table, lecturer login table, student table, student login table, and time (records) table.

2.3.3 Flowchart of the Attendance System

Figure 3 shows the flowchart of the attendance system. The flowchart shows how the designed system is being implemented. When a lecturer login to the attendance website for the first time, he would have to register the course in which he/she want to use attendance for, after that he/she can now login in to a page where he can take and accessed attendance.

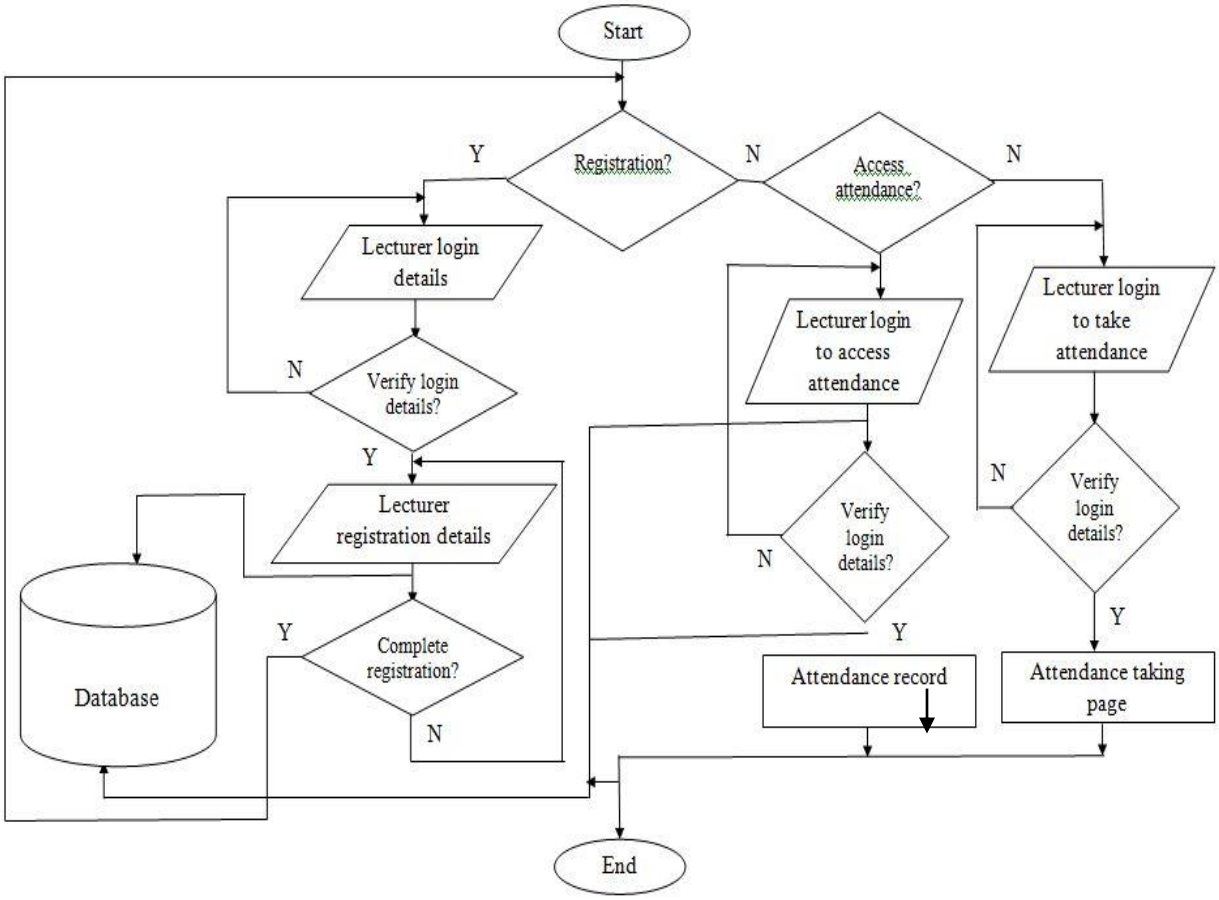

Figure 3: flowchart of the Attendance System

3. Results and Discussion

3.1 Performance Test

This system was tested with attendance records of one hundred and ten students offering several courses at the Department of Computer Engineering, the Federal Polytechnic, Ile-Oluji, Nigeria. The system was run on a computer through a local host server (WAMP Server) for an academic semester of four (4) months. The students' information such as names and matric numbers were saved on the database from the website thus attendance were marked and saved to the database. When the attendance record button from the website is clicked, the list of students' attendance will be displayed.

Questionnaires were served to the students and lecturers of the courses to evaluate the performance of the design. Over eighty percent (80%) of the respondents (lecturers and students) responded that the online attendance system is more effective than the existing manual system of attendance.

The minimum requirements of running this system on a local server are;

i. Windows 7 and above
ii. WAMP Server version 2.2.3 and above
iii. Any Web browser application (l.e chrome, firefox etc.)
iv. MySQL version 4.0 and above.

3.2 Presentation and Discussion of Results

The result of this project is classified into two, which are the front end result and the back end result. The front end result deals with the attendance website which can be accessed by anyone who login to the site while the back end result deal with the database output which can only be accessed by the administrator.

3.2.1 Presentation of Front End Result

The results shown in this section are the results gotten from the attendance website design, which include Figure 4 – Figure 11.

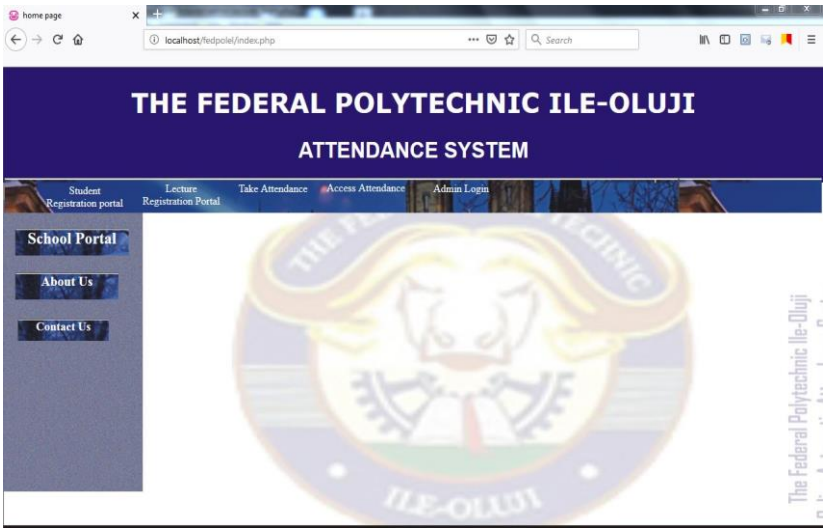

Figure 4: image diagram of attendance site home page

Figure 5: image diagram of student registration portal page

Figure 6: image diagram of the attendance lecturer registration portal page

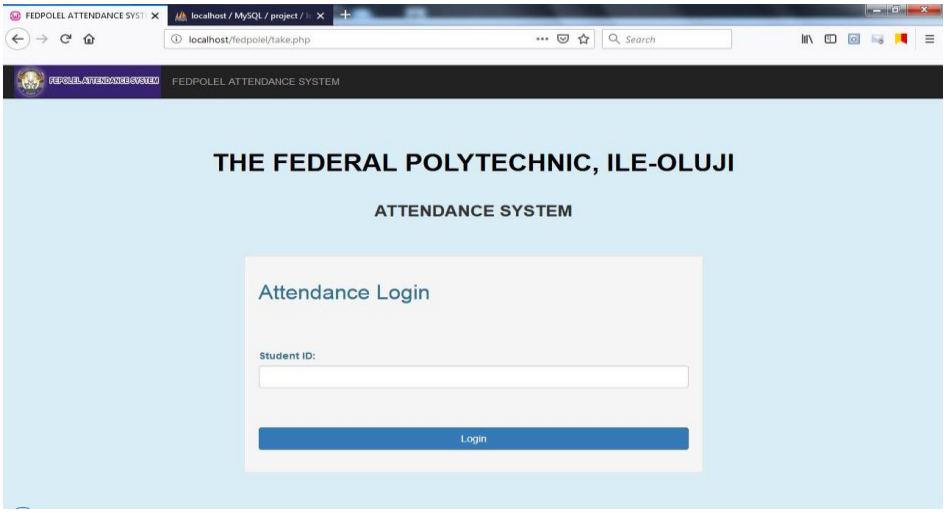

Figure 7: image diagram of attendance marking page

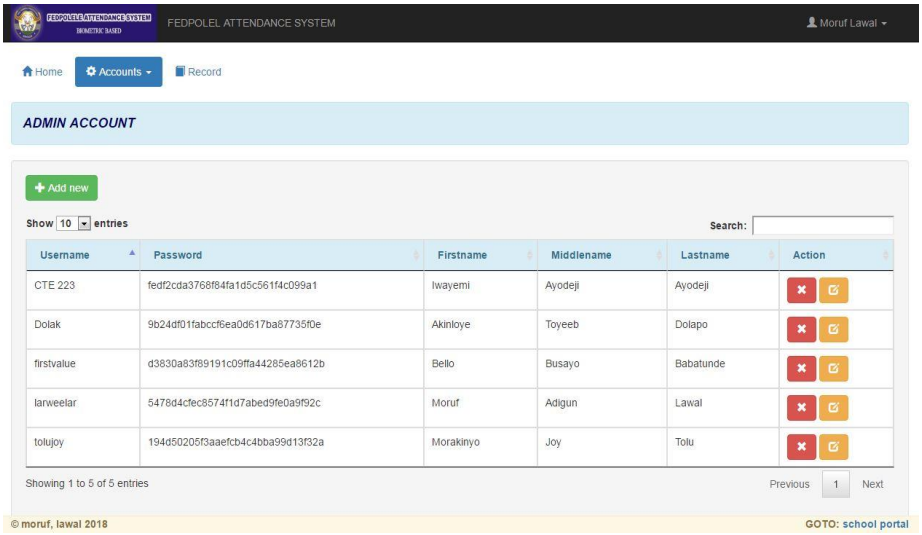

Figure 8: image diagram of access attendance page

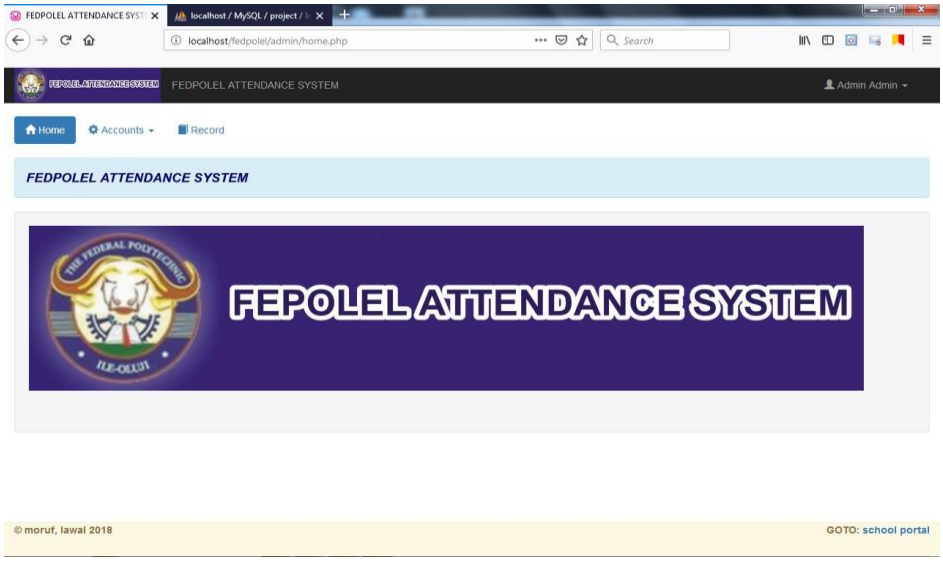

Figure 9: image diagram of the admin login page

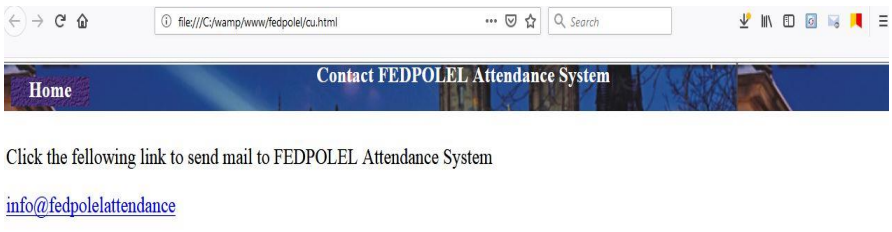

Figure 10: image diagram of the Contact Us page

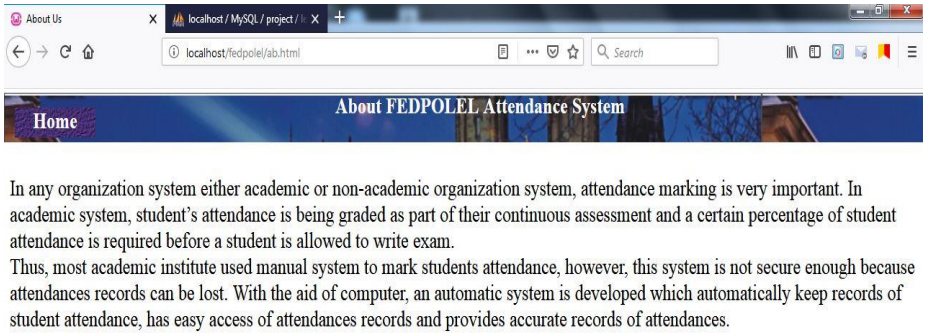

Figure 11: image diagram of the About us page

3.2.2 Presentation of Back End Result

The results shown in this section are the result gotten from the designed database which was used for the attendance system. It includes Figure 12 – Figure 18.

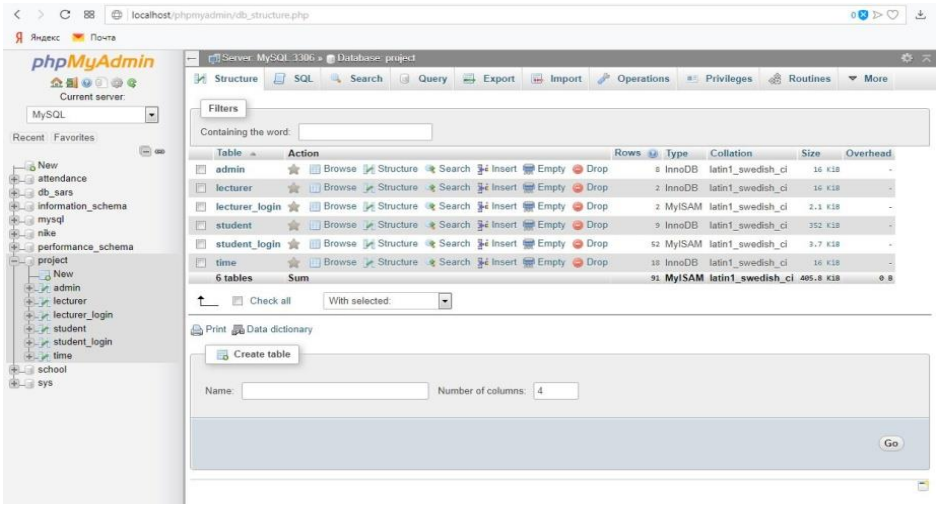

Figure 12: Screenshot of the Attendance database

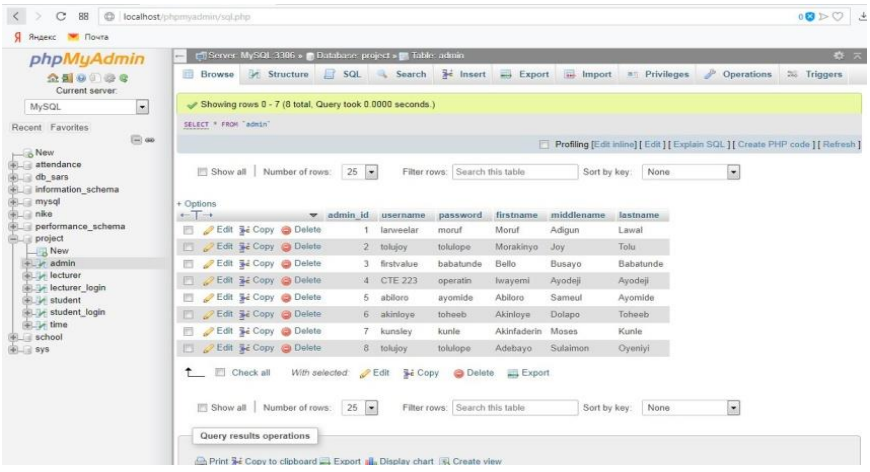

Figure 13: Screenshot of the Admin table

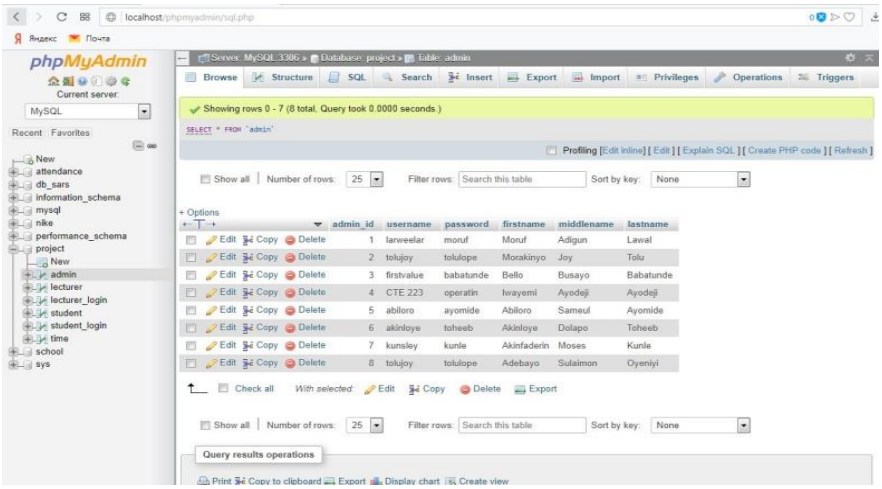

Figure 14: screenshot of the Lecturer table

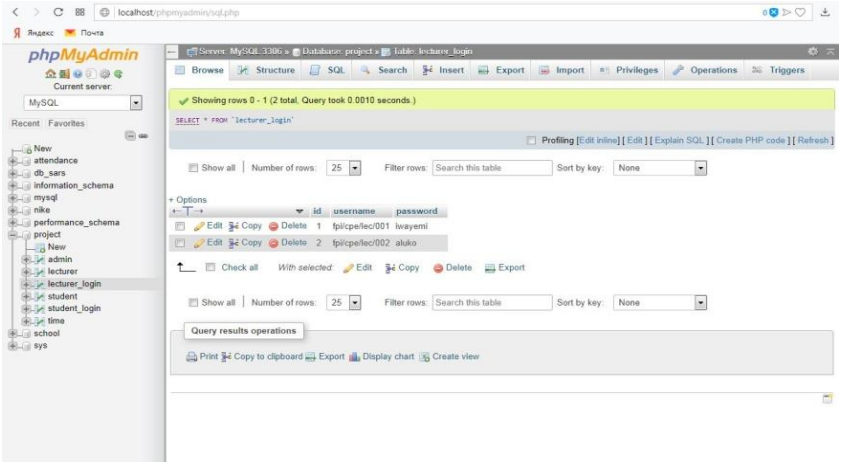

Figure 15: Screenshot of the Lecturer login table

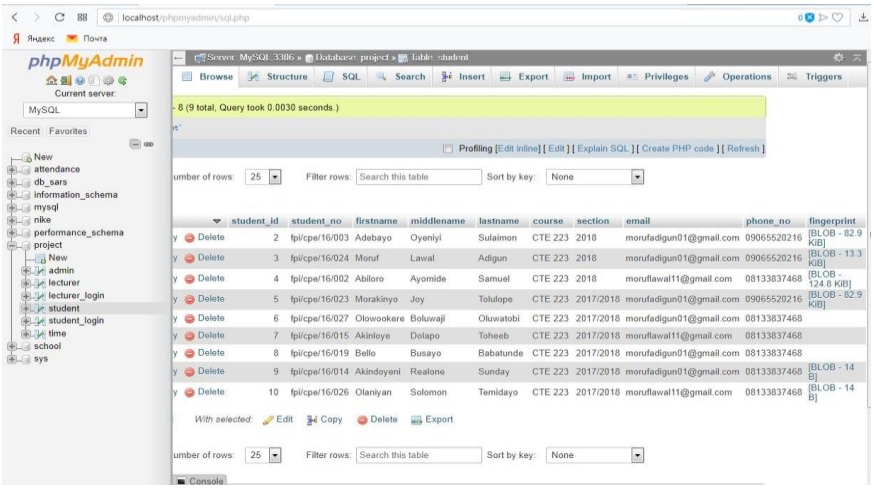

Figure 16: screenshot of the Student table

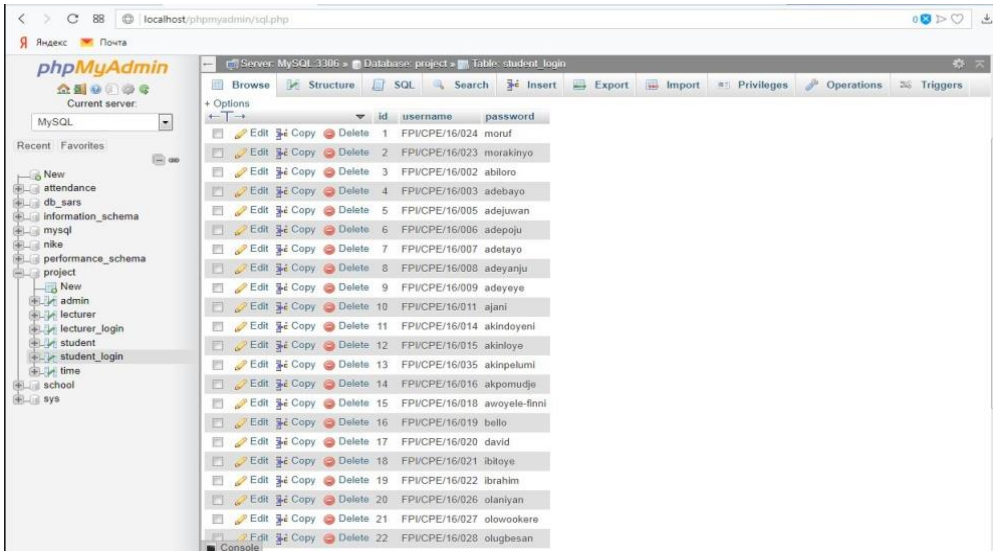

Figure 17: screenshot of the Student login table

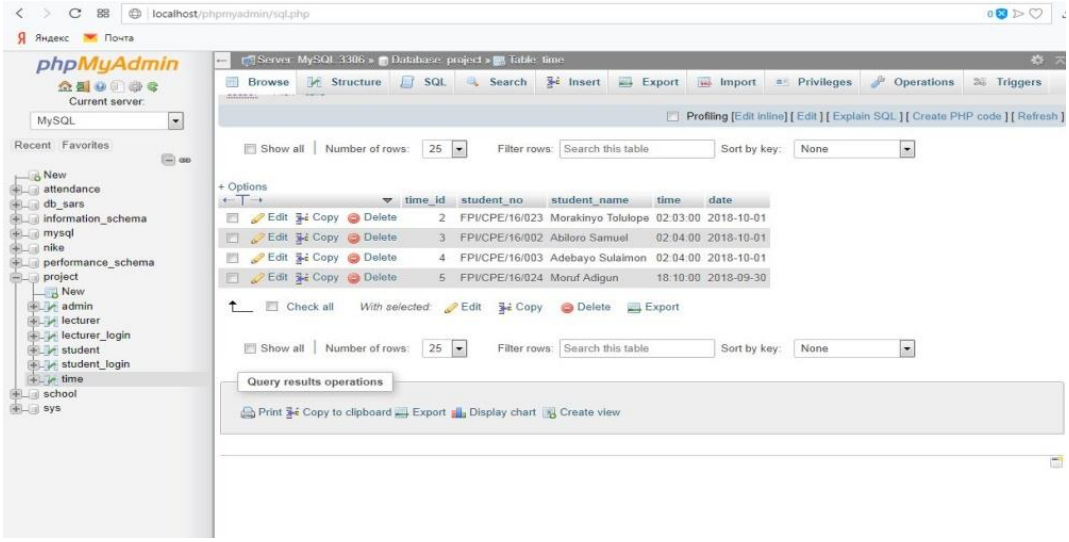

Figure 18: Screenshot of the Time table

3.2.3 Discussion of result

From Figure 4, the home page of the attendance site is the first page loaded when accessing this system and other pages of the website can be accessed directly from this page. When the student registration portal button is clicked on as shown in Figure 4, it opens a page that requires student to input their login details. Every student of the institution has a default login detail which is their matric number as username and surname as password. This student login page prevents anyone who is not a student of the institution to register for the attendance system. All registered student of the institution login details is saved in the student login table of the database shown in Figure 17. If student login details are valid, the student registration portal page is load as shown in Figure 5. The student registration portal is a page where student log in to register for the attendance courses offered and the registration details collected from this page is stored directly into the student table of the database shown in Figure 16.

When the lecturer login page from the home page is clicked, it opens a page that requires a Lecturer to input his/her login details and verify it from lecturer login table of the database shown in Figure 15. This login page prevents anybody who is not a Lecturer to login as a lecturer. If a Lecturer login is valid, it loads a page where the lecturer will register for the attendance system shown in Figure 6 and the data collected from this page is saved in lecturer table of the database shown in Figure 14.

Students' attendance is marked from the "take attendance" page shown in Figure 7 which can be accessed from the home page "take attendance" button is clicked. It is only a Lecturer that can access this page because it requires his/her authorization. This system makes use of the computer time and date. Students' attendance record is stored and fetched from time table of the attendance database shown in Figure 18. The record of attendance can then be checked by clicking on access attendance from home page. Image diagram of access attendance page is shown in Figure 8. The admin login page is used by the administrator of the system. From this page, both lecturer and student data can be accessed and edited. Figure 9 shows the image diagram of this page. Figure 10 and 11 shows the image diagram of the "About us" and "Contact us" pages respectively and can be accessed from the home page.

4. Conclusion and Recommendations

4.1 Conclusion

This attendance system developed provides a secure means of taking attendance in institution eradicates students cheat and eliminates the use of paper in taking attendance. The findings made in this article shows that the use of paper to take attendance is not secure enough and hence, this system serves as a secure means. This system has also proved to be more secured compared to mobile based student attendance management system developed by [10]. They developed and design an android-based mobile attendance application for the management of attendance records in educational organization and to implement new technology development system to make their work digitalized, secured, and use web server to keep attendance records as long as possible. But in their system individual can open the mobile app on his/her phone and take attendance even if he/she is not present which proves the system not be secure enough.
This system also served as easy medium of taking and accessing attendance in an academic institute. It provides editing and deleting of the accessed attendance records, hence is highly flexible and responsive.

The design and implementation of this system is based on the case study of the Federal Polytechnic Ile-Oluji, Ondo state.

4.2 Recommendations

The following are recommended in regards to this paper:

i. Attendance database data should be backed up frequently on a more secured storage drive (probably an external drive that will be used for records keeping only), since the server that stored the records is an electronic device and things like voltage fluctuations, power outages or lightning may occur in supply voltage which may corrupt data on the server.
ii. The lecturers should ensure that their system date and time are correct whenever they want to take student attendance because this system makes use of the system date and time to store records.

5. Conflict of Interest

There is no conflict of interest associated with this work.

References

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Appendix

HTML codes for the attendance home page

```
/**
*HTML header and title declaration section
*/
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>home page</title>
/**
*CSS styling codes section
*/
<style type="text/css">
<body {
        background-image: url(BB.jpg);
        background-color: #FFFFFF;
}
.style1 {
        font-family: Verdana, Arial, Helvetica, sans-serif;
        font-size: xx-large;
}
.style2 {
        font-size: 40px;
        color: #FFFFFF;
}
.style3 {
        color: #FFFFFF;
        font-family: Geneva, Arial, Helvetica, sans-serif;
}
.style5 {color: #FFFFFF}
#Layer1 {
        position:absolute;
        width:309px;
        height:506px;
        z-index:1;
        left: -63px;
        top: 191px;
}
#Layer2 {
        position:absolute;
        width:170px;
```

```
		height:40px;
		z-index:1;
		left: 295px;
		top: 106px;
		background-color: #996600;
}
#Layer3 {
		position:absolute;
		width:151px;
		height:38px;
		z-index:2;
		left: 299px;
		top: 182px;
		background-color: #660066;
}
#Layer4 {
		position:absolute;
		width:1275px;
		height:51px;
		z-index:2;
		left: 2px;
		background-color: #F0F0F0;
}
#form3 #Layer1 #Layer2 {
		background-image: url(pics/b10053.gif);
}
.style8 {color: #FFFFFF; font-size: 16px; }
#form3 #Layer1 #Layer3 {
		background-image: url(pics/b10030.gif);
}
#Layer12 {
		position:absolute;
		width:144px;
		height:42px;
		z-index:3;
		left: 68px;
		top: 115px;
}
#Layer4 #Layer10 {
		background-image: url(pics/b10031.gif);
}
#Layer13 {
		position:absolute;
		width:275px;
		height:424px;
		z-index:3;
		top: 2px;
		left: 6px;
}
#form3 #Layer1 #Layer13 {
		background-image: url(pics/b10053.gif);
}
body {
}
#Layer14 {
		position:absolute;
		width:143px;
		height:30px;
		z-index:8;
		left: 27px;
		top: 104px;
}
#Layer4 #Layer14 {
		border-top-color: #FF0000;
		border-right-color: #FF0000;
		border-bottom-color: #FF0000;
		border-left-color: #FF0000;
}
#Layer15 {
		position:absolute;
		width:177px;
		height:39px;
		z-index:1;
		left: 76px;
		top: 42px;
}
```

```
.style11 {
	color: #FFFFFF;
	font-size: 24px;
	font-weight: bold;
}
#form3 #Layer1 #Layer13 #Layer15 {
	border-top-color: #000066;
	border-right-color: #000066;
	border-bottom-color: #000066;
	border-left-color: #000066;
}
#form3 #Layer1 #Layer13 #Layer15 {
	background-image: url(pics/2.jpg);
}
#form3 #Layer1 #Layer13 #Layer15 {
	background-image: url(pics/2.jpg);
}
#form3 #Layer1 #Layer13 {
	background-image: url(pics/b10053.gif);
}
#Layer16 {
	position:absolute;
	width:161px;
	height:39px;
	z-index:2;
	left: 76px;
	top: 106px;
}
#Layer17 {
	position:absolute;
	width:142px;
	height:32px;
	z-index:3;
	left: 80px;
	top: 173px;
}
#form3 #Layer1 #Layer13 #Layer17 {
	background-image: url(pics/2.jpg);
}
#form3 #Layer1 #Layer13 #Layer16 {
	background-image: url(pics/2.jpg);
}
.style12 {
	color: #FFFFFF;
	font-size: 20px;
	font-weight: bold;
}
.style13 {color: #FFFFFF; font-size: 18px; font-weight: bold; }
#form3 #Layer1 #Layer13 #Layer15 .style11 a {
	text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer16 .style12 .style5 {
	text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer17 .style13 .style5 {
	text-decoration: none;
}
#Layer4 #Layer5 .style8 {
	text-decoration: none;
}
#Layer4 #Layer11 .style6 style5 {
	text-decoration: none;
}
#Layer4 #Layer11 .style6 style5 {
	text-decoration: none;
}
#Layer4 #Layer7 .style5 .style5 {
	text-decoration: none;
}
#Layer4 #Layer11 .style6 style5 {
	text-decoration: none;
}
#Layer4 #Layer8 .style5 .style5 {
	text-decoration: none;
}
#Layer4 #Layer11 .style6 style5 {
```

```
		text-decoration: none;
}
#Layer4 #Layer11 .style6 style5 {
		text-decoration: none;
}
#Layer4 #Layer11 a {
		text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer15 .style11 a {
		text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer15 .style11 a {
		text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer15 div {
		text-decoration: none;
}
#form3 #Layer1 #Layer13 #Layer15 a {
		text-decoration: none;
}
#Layer18 {
		position:absolute;
		width:125px;
		height:38px;
		z-index:8;
		left: 786px;
		top: 7px;
}
#Layer4 #Layer18 .style5 a {
		text-decoration: underline;
}
#Layer4 #Layer18 .style5 a {
		text-decoration: none;
}
-->
</style>
</head>
/**
*HTML body section
*this section contains the mail code of the web page
*/
<body>
<form action="" method="post" name="form1" class="style1" id="form1">
  <h1 align="center" class="style2">THE FEDERAL POLYTECHNIC ILE-OLUJI  </h1>
</form>
<form id="form2" name="form2" method="post" action="">
  <h1 align="center" class="style3">BIOMETRIC BASED  AUTOMATIC ATTENDANCE SYSTEM </h1>
</form>
<div id="Layer4">
  <div id="Layer5">
    <div align="center"><a href="SLI.php"><span class="style8">Student Registration portal</span></a></div>
  </div>
  <div id="Layer11">
    <div align="center"><a href="LLI.php" class="style5">Lecture Registration Portal </a></div>
  </div>
  <div id="Layer7">
    <div align="center" class="style5"><a href="index.php" class="style5">Take Attendance </a></div>
  </div>
  <div id="Layer8">
    <div align="center" class="style5"><a href="admin/lecturer_login.php" class="style5">Access Attendance </a></div>
  </div>
  <div id="Layer9">
    <div align="center" class="style5">Feedback </div>
  </div>
  <div id="Layer18">
    <div align="center" class="style5"><a href="admin/admin_login.php" class="style5">Admin Login</a> </div>
  </div>
</div>
<form id="form3" name="form3" method="post" action="">
  <div id="Layer1">
    <div id="Layer13">
      <div id="Layer15">
        <div align="center"><a href="http://www.fedpolel.edu.ng" class="style11">School Portal </a></div>
      </div>
      <div id="Layer16">
        <div align="center" class="style12"><a href="ab.html" class="style5">About Us </a></div>
```

```
    </div>
    <div id="Layer17">
      <div align="center" class="style13"><a href="cu.html" class="style5">Contact Us </a></div>
    </div>
   </div>
  </div>
</form>
</body>
</html>
```