Research Paper

Web Based Teaching Practice Management System (WBTPMS)-A Case Study of Federal University

Dutsin-Ma, Katsina State Nigeria

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ABSTRACT
Teaching Practice (TP) is an integral part of the teacher education program which is geared towards preparing new entrants into the teaching profession. In Nigeria, teacher education program exists in consonance with the various levels of education:Nigeria Certificate in Education (NCE) and Bachelor of Education (B.Ed.) for Colleges of Education and Universities respectively. The current way of assessing student-teachers undertaking teaching practice from Federal University Dutsin-Ma (FUDMA) as the scope of our study is done manually. Thesupervisors have to travel to any cooperating school where student-teachersare in order to monitor activities of student-teachers. This leads to time wastage and also improper record keeping because manual method is used by both the Supervisors and student-teachers to keep TP records.Also in short time, Supervisors assess student-teachers and partly rely on the comments of Internal Supervisors. In order to improve the system, this work is aimed atanalyzing the current manual system, the problems associated with it andaugmenting it into a web based system for managing Teaching Practice in FUDMA. The web based system provides more efficient way for easier management of TP and safe record keeping. Extreme Programming (XP) Process as a software model was used in designing the new system and other tools used are XAMMP server,My Structured Query Language(MySQL) for record keeping, Hypertext Preprocessor (PHP) for linking database to web pages, Hypertext Markup Language (HTML) for designing the web pages, Cascading Style Sheets (CSS) for styling the design of web pages and Microsoft word for Entity-Relationship(E-R) diagrams and documentation.WBTPMScan further be refined to suit the needs of other sister higher institutions of learning for the management of student-teachers assessment.
Keywords: Teaching Practice, Supervisor, student-teacher, Record Keeping,Cooperating School,Manual System, Web-based System, Extreme Programming.

I. INTRODUCTION

1.1 Background to the Study

Teaching practice occupies a key position in the teacher education program. It is an integral part of the teacher education program which is geared towards preparing new entrants into the teaching profession. According to Haastrup, Hezekial, Adenikeand Stella (2014), teaching practice exercise is to acquaint student-teachers with the practical knowledge of teaching and learning process including lesson plan preparation, presentation, class management, communication skills, evaluation and the required personality of professional teachers. Eilu (2009) as well asEdith and Samuel (2009) remarked that teaching practice is the name of the preparation of student-teacher for teaching by practical training. From the foregoing, it can be inferred that teaching practice is a school based internship program with the main aim of introducing prospective student-teachers to teaching and its routine under the guidance of qualified professionals to develop skills, attitudes and competence in the profession.

In Nigeria, teacher education program exists in consonance with the various levels of education i.e. NCE and B.Ed. for Colleges of Education and Universities respectively (Eilu, 2009). All the teacher training institutions are not only imparting theoretical but also practical knowledge and skill inteaching different subject to prospective teachers (Cecelia and Petro, 2015). At some point prior to the end of the program, teaching

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practice is carried out for practical application of theoretical understanding about different teaching methods (Kiggundu, 2007; Maraisand Meier, 2004).

In FUDMA, teaching practice management is absolutely done manually in this age of the 21st century. Due to the movement of many systems online which provides a fast and efficient way to manage them, this work came into being in order to proffer solution towards ensuring that student-teachers are much more routinely monitored now more than ever before through the new platform provided.

1.2 Problem Statements

The manual way of assessing student-teachers in FUDMA is faced with many problems. Some of these drawbacks are identified in FUDMA and most of which have been defined by Menter (1989) as well as Ahmodu, Shuaibu and Musa (2014):

i. Obtained literature reveal that students find their TP period to be boring, most tasking and exploitative especially with regards to their relationship with respective cooperating school supervisors.

ii. Furthermore, given the fact that TP has a weight of 3 credit units in FUDMA, institutionalsupervisors are unable to acquaint themselves thoroughly with all the necessary tasks that theirassigned TP students undertake within the period.

iii. In less than 30 minutes, Supervisors assess students and partly rely on the comments of internalsupervisors.

iv. This limited time frame does not favor most students grade-wise. Ultimately, most studentsGPA and CGPA are found wanting as a result of TP.

v. Expectedly, the TP period is nursed as the practicalization of the theories learnt within the four (4) walls of the classroom. However, student-teachers are overburdened with a whole lot of work in the cooperating schools assuming the status of full time and paid teachers.

This system is developed in order to enable institutional supervisors acquaint themselves thoroughly with the workings of their student-teachers. Hopefully, this would count when it comes to one-on-one assessment of student-teachers at their respective cooperating schools by institutional supervisors

II. SYSTEM ANALYSIS AND REQUIRED TOOLS

2.1 Teaching Practice Process Review

The details below describe how TP is carried out in FUDMA currently:

i. TP is carried out by 300 level students who are studying Bachelor of Science/Arts in Education courses spanning six months during second semester of every session.

ii. For a student to be eligible for TP, he/she must pass two (2) theoretical teaching practice courses offered at 200 level.

iii. Each of the TP courses in (ii) above is offered in each of the semester at 200 Level.

iv. The students are posted to the schools in the environment where the University is located i.e. Dutsin-Ma town as approved by the Dean.

v. The name given to schools that acceptsTP students are called Cooperating schools.

vi. The arrangement for available lecturers to visit the student-teachers while on the TP exercise is taken by the Faculty TP Coordinator.

vii. Three lecturers are posted to each student for assessment to allow for objectivity.

viii. The assessment sheets are made available to the lecturers by the TP coordinator. There are three assessment sheets in which two are given to the supervisor which are:
   - TP assessment form
   - TP supervisor's summary score sheet

ix. The last assessment sheet which is TP collation form is used by the TP coordinator to calculate the total marks earned and accrued to each student at the end of the exercise.

2.2 Technologies and Softwares

2.2.1 NetBeans

NetBeans is an open-source Integrated Development Environment (IDE) that lets you quickly and easily develop desktop, mobile and web application as well as HTML applications and CSS. The IDE also provides a great set of tools for PHP developers.
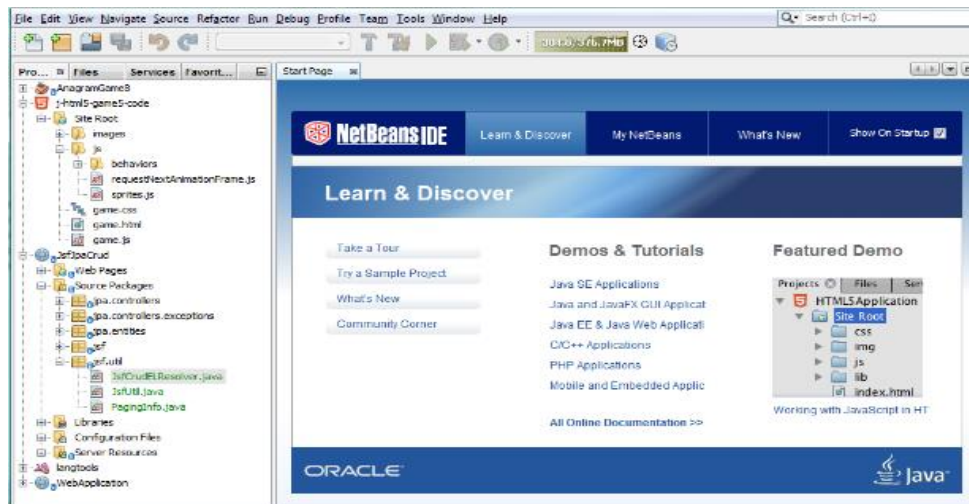
Fig 1: Sample Interface of NetBeans for developing Web-based System

2.2.2XAMPP Server

XAMPP is a free and open source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database and interpreters for scripts written in the PHP and Perl programming languages. XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes.
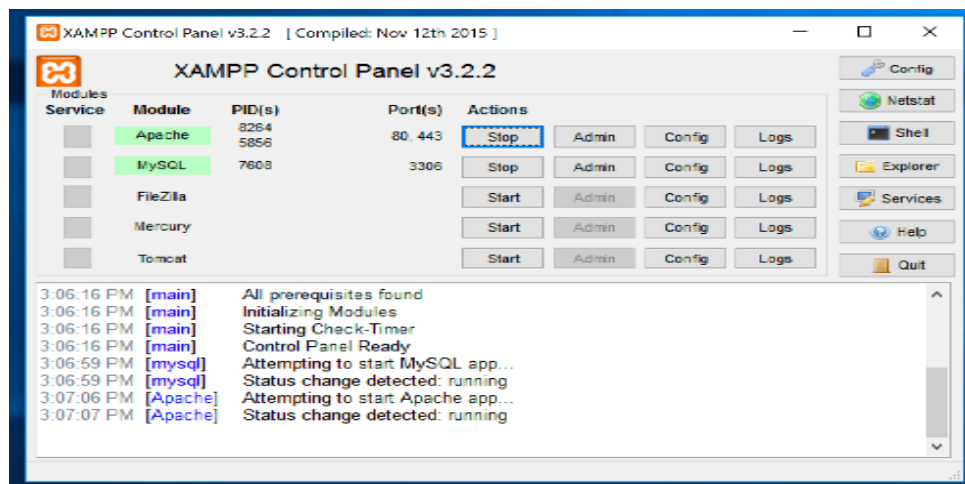

Fig 2: XAMPP server control pane

2.2.3 MySQL Database

MySQL is an open source Relational Database Management System (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX and Windows. The database used for this application is phpMyAdmin which is part of the server (XAMPP) used.

2.2.4 Ms Word

Microsoft Word(often called Word) is a graphical word processing program that users can type with. It is managed by Microsoft Incorporated. Its purpose is to allow users to type and save documents. Similar to other word processors, it has helpful tools to make documents. This software was used to draw E-R diagrams and also for documentation.

2.3 Related Work

To the best of our little knowledge, no Nigerian higher institution of learning currently manages TP using an automated Web-based system. As a pioneer software that manages TP online, it will expand the need for research in TP and also makes coordinating TP a simple task for Universities. The knowledge acquired can also be beneficial for future Teaching Practice management and policy making.

III.   METHODOLOGY

3.1   Basic Concept

This section gives an outline of research methods that were followed in order to create the new web based system. The Software Development Life Cycle (SDLC) that was used consists of six phases. SDLC which is also called software development process is a framework defining tasks performed at each step in the software development process. The phases of the SDLC are:

 i.   Requirement analysis: This stage of the SDLC means getting input from all stakeholdersand alsolearning the strengths and weaknesses of the current system with improvement as the goal.

 ii.   Planning: In this stage of the SDLC, the team determines the cost and resources required for implementing the analyzed requirements.

iii.   Software design: This phase of the SDLC starts by turning the software specifications into a design plan called the Design Specification.

iv.   Software development: At this stage, the actual development starts.

 v.   Testing: In this stage, we test for defects and deficiencies. We fix those issues until the product meets the original specifications. In short, we verify that the code meets the defined requirements.

vi.   Deployment: At this stage, the goal is to deploy the software to the production environment so users can start using the product.
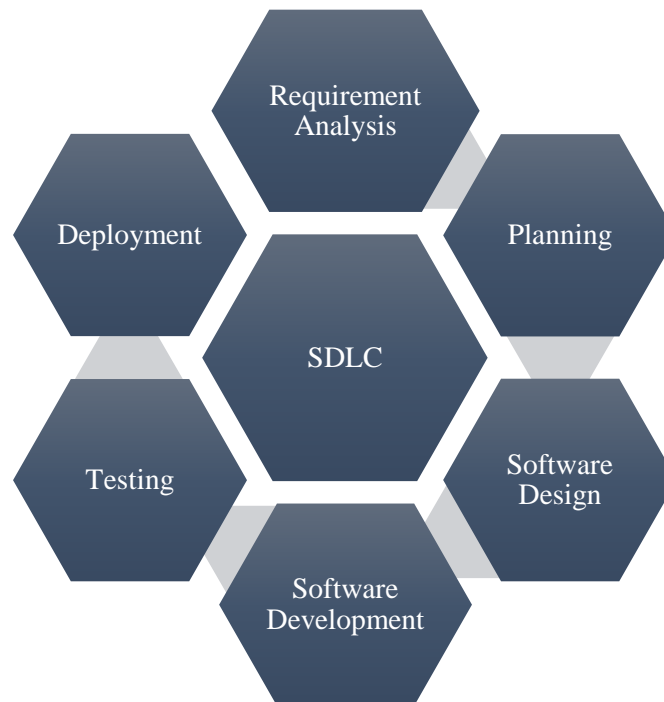

Fig 3: Software Development Life Cycle

The SDLC involves six phases as explained above. Popular SDLC models include the Waterfall Model, Spiral Model and Agile Model.In this work, Extreme Programming (XP) as one of the Agile Software Development Methodologiesis used.

Agile Model

The Agile SDLC model separates the product into cycles and delivers a working product very quickly. This methodology produces a succession of releases. Testing of each release feeds back information that's incorporated into the next version.

Extreme programming (XP)

XP as a type of Agile Software Developmentadvocates frequent releases in short development cycles which is intended to improve productivity and introduce checkpoints at which new customer requirements can be adopted. XP is suitable for the project because of its simplicity and also it focuses on incremental development with frequent testing (Ramya, Phani, Phaniand Vamsi 2011;Takaaki, Kenseiand Tetsuro, 2014).

3.2   XP Phases

3.2.1   Requirement Planning

a.   Research Current Situation

Current way of conducting and assessing TP students in FUDMA was researched using interview and ethnography. The Faculty TP Coordinator, FUDMA was interviewed regarding the processes of conducting TP.Also, all the materials used in TP exercise were obtained from him. Some students that participated in TP were interrogated for further information.

b.   Define Requirement

In this stage, the TP coordinator specify the functionality of the system, the number of users (TP Coordinator, TP Supervisors and Students) and what they do is explained. There are two (2) admins in WBTPMS each having specific privilege: the Central Admin (i.e. Faculty TP Coordinator) and TP Supervisors. The Central Admin manages the works of the TP Supervisors and student-teachers while TP supervisorsmanage the works of the student-teachers only.

c.   Finalize Requirement

After getting the requirements, it's turned into a formal document using MS Word containing the design of the system. The design of the new system is achieved using Data Flow Diagrams (DFD),Gant Chart and the Site Maps as shown below:
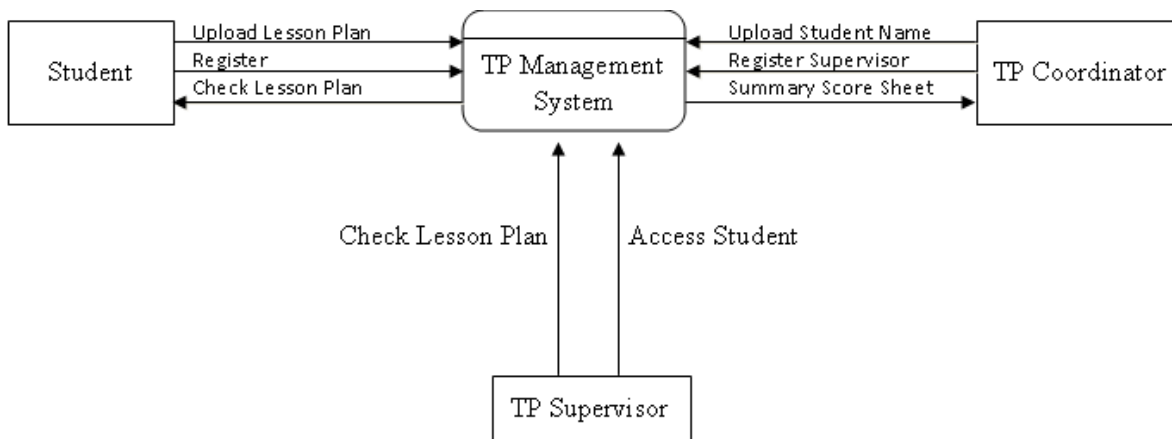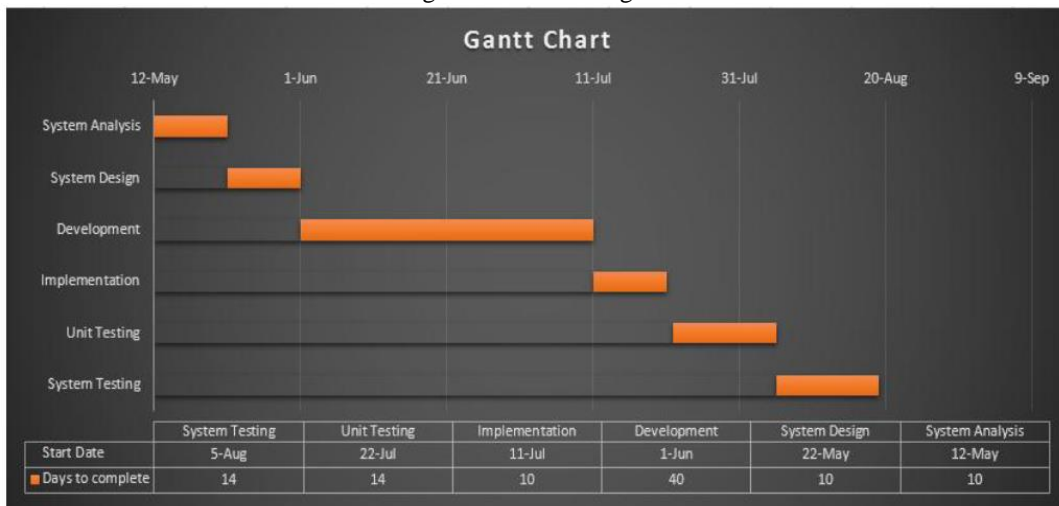
Fig 4:Data Flow Diagram

Fig 5:ResearchTimeframe

3.2.2   User Design

i.   Proposed system site map

A sitemap is a road map that is followed during the development of a website. It outlines the goals and purposes of a site, such as attracting new leads or making online sales, to give direction to your project. It also helps you provide your visitors with an enhanced user experience like easy navigation by establishing the hierarchy of your site's pages at an early stage.

A sitemap is a resource that the client and the web design team can refer back to throughout the project. It is a handy tool that displays the relationships between your site's pages and its content elements. Ultimately, building a website without a sitemap is like building a house without a blueprint.
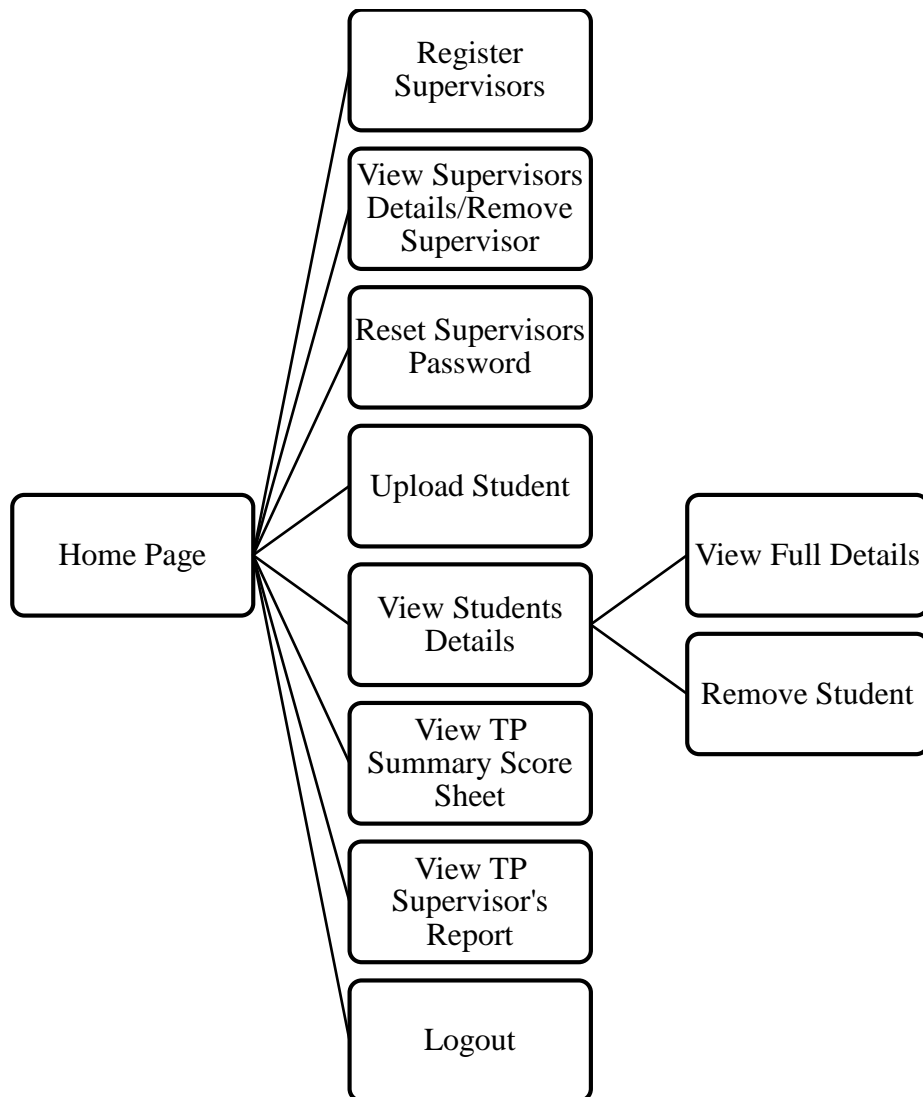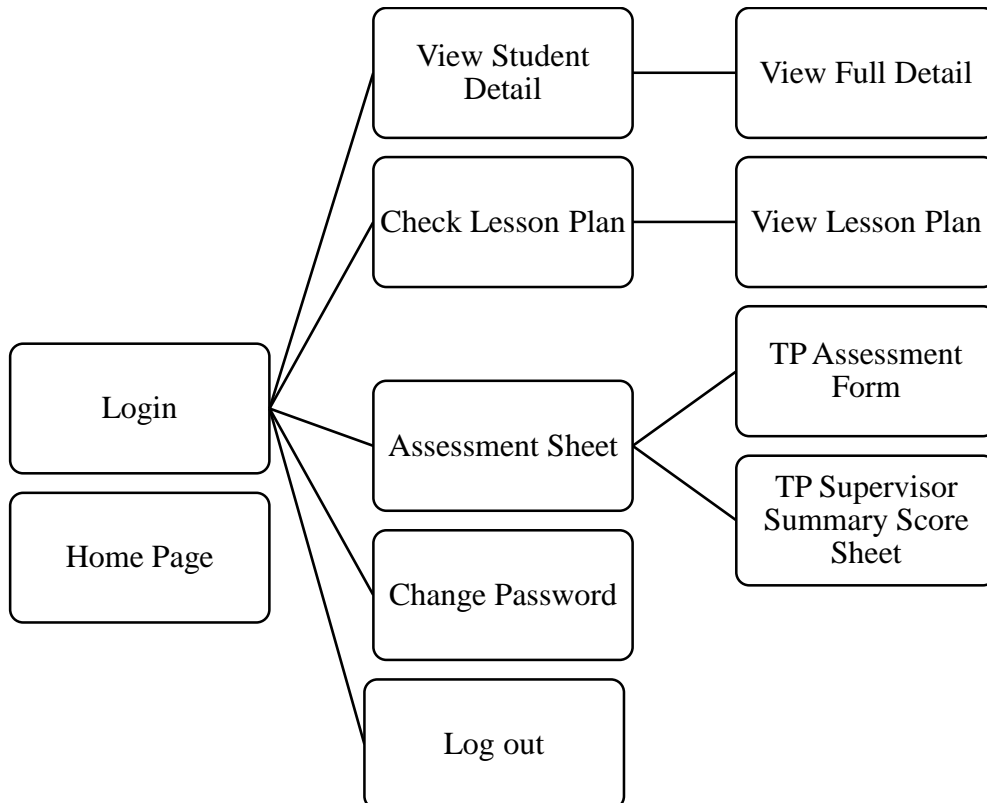

Fig 6:TP Coordinator Site Map
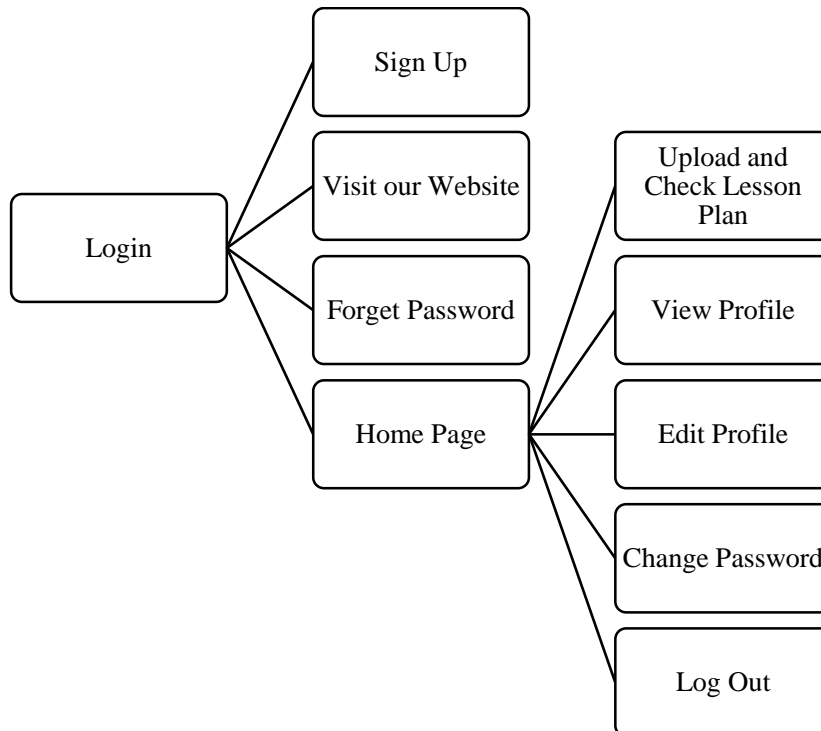
Fig 7:TP Supervisors Site Map

Fig 8:Students Site Map

ii.   ProposedSystem Design and Interfaces

The system is design using MS word. After completing the design, interactions between the functions and data are identified. This task produces required system function, reusable design components, system architecture and layouts of screens to be supported by the system.

iii.   Refine System Design

The outcome from the previous is revised. The system function isanalyzed and verified to make sure it meets client satisfaction. If any necessary function is missing, it is recorded and verified again.

iv.   Implementation Strategies

The approach to implement on web based system is selected after reviewing the system design. All the tasks required to develop the system are decided. The estimated required effort to complete each task is made and summarized into overall estimation project cost.

v.   Obtain Approval

A meeting is held with the System Supervisor. The system design obtained, and implementation strategies are presented so that stakeholders understand how the system is developed. This meeting is also to verify if the system design needs any more changes or not. Then, approval is obtained and ready to proceed to construction phase.

IV.   IMPLEMENTATION

In an Information Technology (IT) context, software or hardware implementation encompasses allthe post-sale processes involved in something operating properly in its environment, including analyzing requirements, installation, configuration, customization, running, testing, systems integrations, user training, delivery and making necessary changes. The word "deployment" is sometimes used to mean the same thing.

4.1 Environment Development

Environment to develop the web based system is set up. XAMPP server is used to host the web site using a computer as the local host.

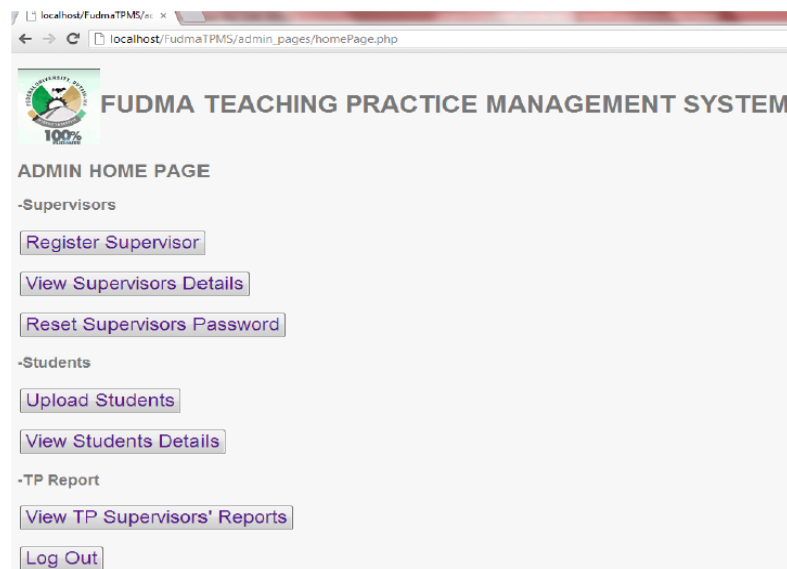4.2   System Functionality

4.2.1   TP Coordinator Section

Fig 9: TP Coordinator Home Page

Fig 9 shows the home page of TP coordinator.When logged in, he/she is directed to the home page which has this link (http://localhost/FudmaTPMS/admin_pages/homePage.php). The home page contains the links to other pages to which the TP Coordinator performs other functions.
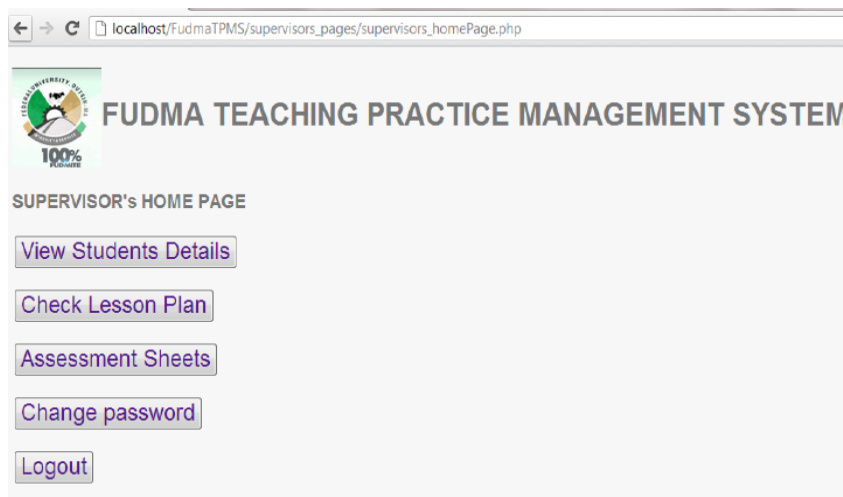
4.2.2   TP Supervisors Section

Fig 10: TP Supervisor home page

Assigned TP Supervisors use the login page to get access to the system via this link (http://localhost/FudmaTPMS/supervisors_pages/Login.php). The TP supervisor uses an ID and password given to him/her to login. The home page contains the links to other pages to which the TP Supervisor performs other functions.
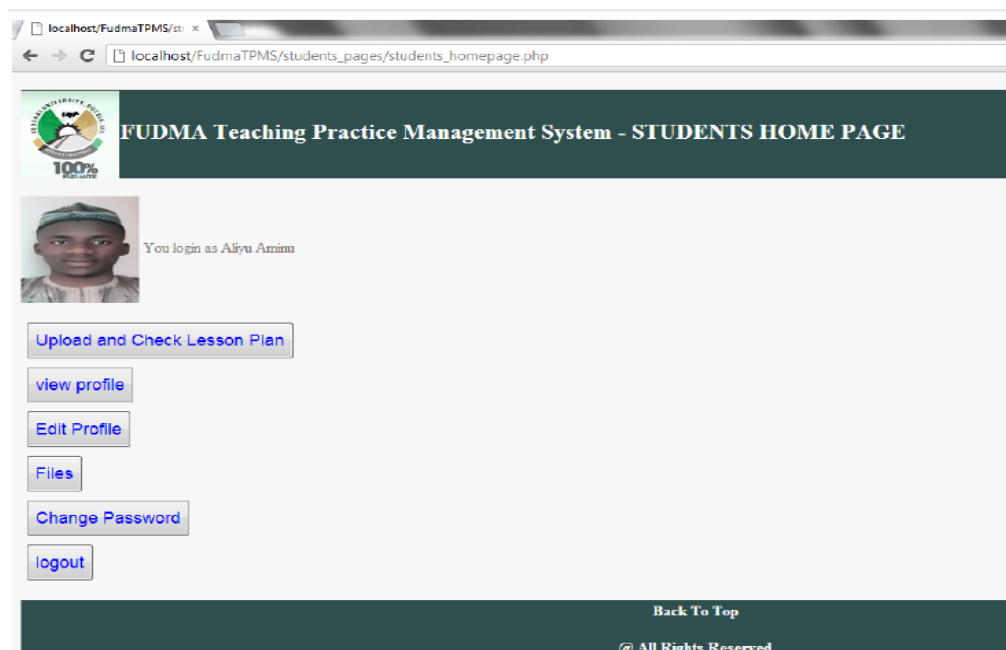
4.2.3   Student-teachers Section

Fig 11: TP Student home page

Student-teachers use the login page to gain access to the system via this link (http://localhost/FudmaTPMS/index.php). After the student logged in, he/she is directed to students' home page which contains the links to other pages to which the studentperforms other functions.

V. CONCLUSION AND FUTURE WORK

5.1 Conclusion

This work set out to address most of the problems that affects teaching practice management in FUDMA by developing an online web based system which helps in managing some activities like regular supervision of students lesson plan, prompt correcting of mistakes students make while filling the e-lesson plan,

keeping students' records, assessing students online, etcetera.The objectives of thework are to analyze the existing manual system, develop the necessary software to manage the TP activities, test and implement the software.

In the process of creating this system named "**Web Based Teaching Practice Management System**", Analysis of the existing manual system was carried out. Interview, ethnography and observation were used to get the data that are required for this work. Using the knowledge gotten from the drawbacks of the existing system, a new web-based system is developed.

The design of the new system was achieved using Extreme Programming Methodology which deals with incremental development to implementing the system. With the support provided by PHP, HTML, CSS and MYSQL, the web based application is coded.

The validation and testing of the system was done component by component because XP Methodology defines component by component release of subsystems. When the design and coding of a single component is done, it is carried to the client for validation and testing.

5.2 Future Work

For the effective use of this site, a lot still needs to be done in order to make it most effective. This involves:

1.   Due to the high proliferation of android phones, an android version of the web based system shouldbe developed.

2.   A Live video section be implemented so that Supervisors can have a view of student-teachers in class from the comfort of their offices.

3.   A Live chat section be augmented to support/enhance Supervisor-Student conversation.

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