

A
PROJECT REPORT
ON
“ Web Development For PTMPL Advertising”

IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF

BACHELOR OF ENGINEERING (Computer Engineering)

SUBMITTED BY

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Under The Supervision of

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
ARVIND GAVALI COLLEGE OF ENGINEERING, SATARA

2020-21

CERTIFICATE

This is to certify that the Project report entitled “Web Development For PTMPL Advertising” is a bonafide work carried out by:

Miss. Sayali Somanath Pawar.

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under our supervision, during the year 2020-21 and submitted to the Faculty of Computer Science Engineering, AGCE, Satara.

In partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science & Engineering.

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Dr. Pharande V. A

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UNDERTAKING

We hereby declare that the details furnished above are true and correct to the best of our knowledge and belief and we undertake to inform authorities about any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, we are aware that we may be held liable for it.

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3	Miss. Harshada Pramod Kshirsagar	4024	
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Date:

Place : Satara

Acknowledgment

It is our privilege to acknowledge my deep sense of gratitude to my guide Prof. Pathak P. A. in Computer Science and Engineering at Arvind Gavali College of Engineering, Satara for his/her valuable suggestions and guidance throughout our degree course and the timely help given to us in completion of our project work.

We are thankful to Dr. V. A. Pharande, Principal, Arvind Gavali College of Engineering, Satara, and Prof. Bhosale V. K., Computer Science and Engineering department for their kind co-operation moral support.

Finally, we wish to express our sincere thanks to all the staff members of Arvind Gavali College of Engineering, Satara for their direct and indirect help during the course of our project.

Date:

Place : Satara

Sponsorship Letter

RUDRA
architects, interiors, landscape & master planners.
Sai ratna building, near mane hospital, Visawa park, Satara, Maharashtra. 415002
555harshaigurav@gmail.com

Date: 05/07/21

To,
The principal,
Arvind Gavali College of Engg.,
Satara- 415015.


Subject: Sponsorship Confirmation Letter.

Dear Sir/Madam,

This letter verifies that we sponsoring the Customized Web Application for **RUDRA_construction_** company project for AGCE final year Computer Science & Engineering students 2020-2021. It is our pleasure to confirm that the following students are working on our construction company web application project. We will host this web application on our server in next week.

Miss Pawar Sayali Somnath	Roll. No. - 4010
Miss Kirve Ravina Dipak	Roll. No. - 4022
Miss Kshirsagar Harshada Pramod	Roll. No. - 4024
Miss Jagtap Swati Sudhir	Roll. No. - 4057
Miss Dhotre Sonali Pitambar	Roll. No. - 4073

Our company management was reviewed **RUDRA_construction_** project outcome and performance. We hope the same co-operation in future.


For, M/s Harshal Gurav & Associate

REGD.No.CA/2015/73253

MOB.NO. 8888310818

Abstract

The project ‘Web Development For PTMPL Advertising’ is a web- based application. Web Service technologies are being considered for use with distributed databases. It’s a natural application, as Web Service technologies have emerged as the foundation for today’s distributed and decentralized systems. We also talk about how to set up a website, with a focus on the Xampp tool, which is a localhost. We then compare various web application development frameworks. We also go through the web application life cycle model and framework development. Various review papers’ results are also given in this report to help users understand the challenges they may encounter. This discusses the technologies utilized in this development, specifically PHP, and the functionality of Xampp as a result, with screenshots. It is believed that it would serve as a valuable guide for the procedure.

Keyword:-MySQL, PHP7, JavaScript, HTML5, CSS3.

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CHAPTER 1

INTRODUCTION

GENERAL INTRODUCTION

INTRODUCTION

The existing system does not include any web-based tool for advertising the company. The company uses pamphlets or brochures for showcasing information or bringing new clients. But the problem with this is the information does not reach the target person. Due to this, human effort and paper are wasting. But 'Advertising for PTMPL' gives an online interface for the same purpose.

A construction website is a valuable marketing tool. Simply put, it can and will bring more clients. The system puts Rudra's construction business on the map so that any potential client out there can find Rudra Construction company. It will reflect Rudra Construction's professionalism. This construction website not only advertises the Rudra Construction company but also gives power to an admin to add specific construction project details to the website. It provides additional flexibility to showcase project details as per company need. With the help of this website, the admin can add, delete, modify, and view the work details. For that, he needs to log in to the system and then perform an appropriate action. Admin can add or edit the following construction projects details: Type of plot/flat, owner name, land area, location, price, square ft. size, description of property, property images, etc.,.

SOURCE OF INFORMATION

We collect all information from Rudra Construction. They provide us all the necessary and relevant information needed for our project with great pleasure. There are various techniques for gathering information for the project like face-to-face interviews, onsite observation, questionnaire, telephonic interviews. In which we used face to face interviews and onsite observation. The people who helped in giving the information related to our project-

Owner – Mr. Harshal Gurav

PROBLEM STATEMENT

In its most widely used context, construction covers the processes involved in delivering buildings, infrastructure and industrial facilities, and activities through to the end of their life. In the Builders website we can get information related to flats and plots and also other advertisings.

AIMS AND OBJECTIVES OF THE PRESENT WORK

- 1) To provide an easy user interface to input the object image.
- 2) The User should be able to upload the image.
- 3) The System should be able to pre-process the given input to suppress the background.
- 4) The System should detect text regions present in the image.
- 5) The System should retrieve text present in the image and display them to the user.

CHAPTER 2

LITERATURE REVIEW

2.1 LITERATURE REVIEW

1.Paper name: Website Building Systems Design And Implementation based on content management

Author: Bing Liul, Xiaojing Zhoul, Yuanyuan Dangl ,Zhiyu Chen [2010]

Abstract: This paper proposed a Page Rank algorithm based on a column to sort and make the system generated sites more flexible through the content management and website building, system research, Design and implementation.

2.Paper name: A Research Paper On Website Development Optimization Using Xampp/PHP

Author: Punam Kumari and Rainu Nandal[2017]

Abstract: This research paper discussing the various useful tools and techniques that are used in the development of a website. We also discuss the procedure followed in a website, mostly focused on a localhost named Xampp tool. Next, we compare different development frameworks web application. In this report, various review paper result also included for understanding of problems can be faced by the users. This Paper tells about the technologies used in this development, PHP, and explained its functionality with Xampp.

3.Paper name: Analysis and Practical Application of PHP Frameworks in Development of Web Information Systems

Author: Natalya Prokofyeva, Victoria Boltunova[2016]

Abstract: This paper provides various PHP programming framework popularity overviewand comparisons using various criteria. Based on the data obtained during the study two frameworks were selected for deeper analysis - Symfony2 and PhalconPHP. This article offers a description of the architecture and main features of the selected frameworks. During framework comparison, a performance test was developedto determine the performance and effectiveness of frameworks during the same task.

4.Paper name: Application of PHP and MySQL for search and retrieval Web services in Web information systems

Author: Elisaveta Trichkova [2020]

Abstract: Web Service technologies are appeared to be today's base for distributed and decentralized systems. This paper aims to present Web service for searching and retrieval in distributed databases. This Web application is named "Bulgarian technical index for citation". This information is extracted in distributed databases. The paper examines application uses MySQL for storing references and uses PHP for displaying the content in HTML format.

5.Paper name: Web Engineering: A New Discipline for Development of Web-based Systems.

Author: San Murugesan, Yogesh Deshpande, Steve Hansen and Athula Ginige

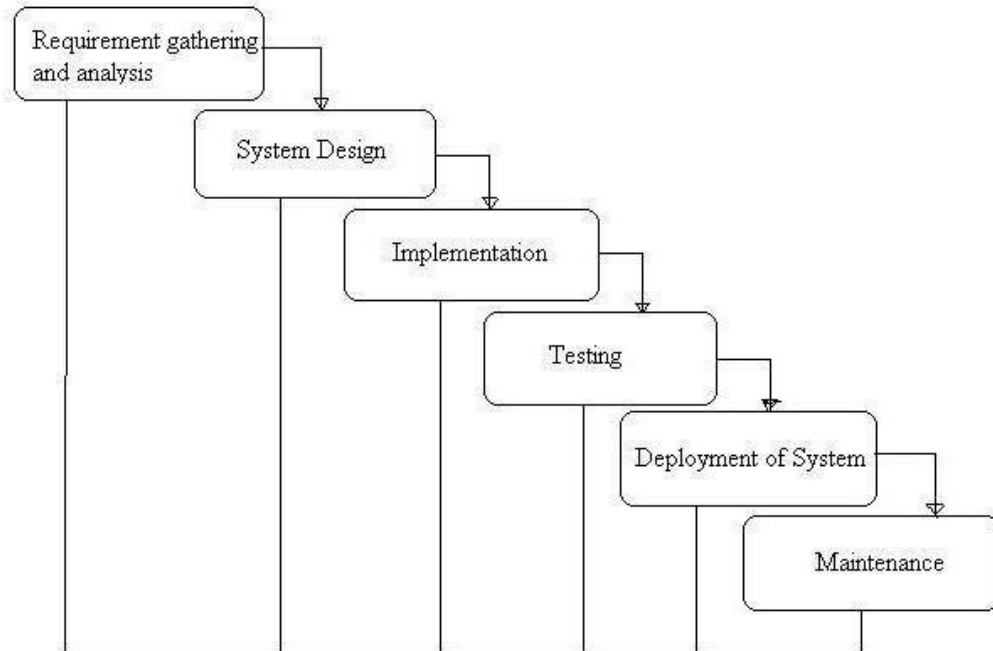
Abstract: This paper gives an introductory overview of Web Engineering. It presents the principles and roles of Web Engineering, assesses the similarities and differences between the development of traditional software and Web-based systems, identifies key Web engineering activities, and reviews some of the ongoing work in this area. It also highlights the prospects of Web engineering and the areas that need further study.

CHAPTER 3

HARDWARE IMPLEMENTATION

METHODOLOGIES

General Overview of "Waterfall Model"



1. Requirement gathering and analysis

In this step of the waterfall, we identify what are various requirements are needed for our project such as software and hardware required, database, and interfaces.

2. System Design:

In this system design phase, we design the system which is easily understood for end-users i.e. user friendly.

We design some UML diagrams and data flow diagrams to understand the system flow and system module and sequence of execution.

3. Implementation:

In the implementation phase of our project, we have implemented various modules required to successfully get expected outcome at the different module levels.

With inputs from system design, the system is first developed in small programs called units, which are integrated with the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.

4. Testing:

The different test cases are performed to test whether the project module is giving the expected outcome in the assumed time. All the units developed in the implementation phase are integrated into a system after testing each unit. Post integration the entire system is tested for any faults and failures.

5. Deployment of System:

Once the functional and nonfunctional testing is done, the product is deployed in the customer environment or released into the market.

6. Maintenance:

There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

HARDWARE RESOURCES REQUIRED

Sr. No.	Parameter	Minimum Requirement	Justification
1	CPU Speed	2 GHz	Remark Required
2	RAM	3 GB	Remark Required
3	Platform	Windows 7 or above/Linux/Mac OS	Remark Required

Table 3.1: Hardware Requirements

CHAPTER 4

SOFTWARE IMPLEMENTATION

PROGRAMMING LANGUAGE:

- HTML5
- CSS3
- Javascript

SERVER :

XAMPP

DATABASE :

MySql

TECHNOLOGY :

PHP 7

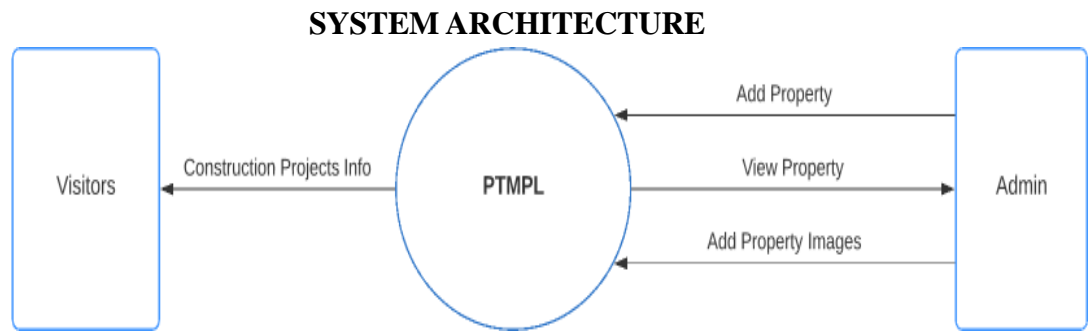


Figure 4.1: Data Flow Diagram

The System has the following input :

- Add Property and Add Property Images are input as the admin add property information and images.

The System has the following output:

- The images and information added by the project can be viewed by visitors and admin.

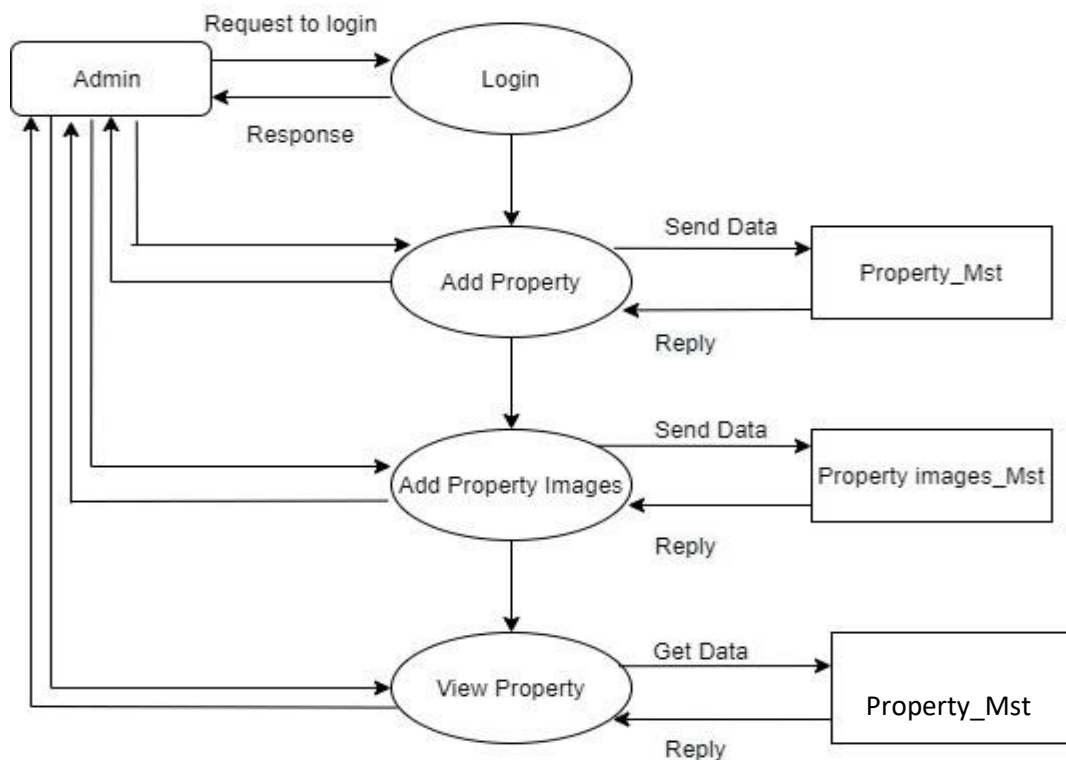


Figure 4.2: Data Flow Diagram

For processing the login request, process login is responsible. For properties, the different activities involved are represented by processes add property, add property images, and view property.

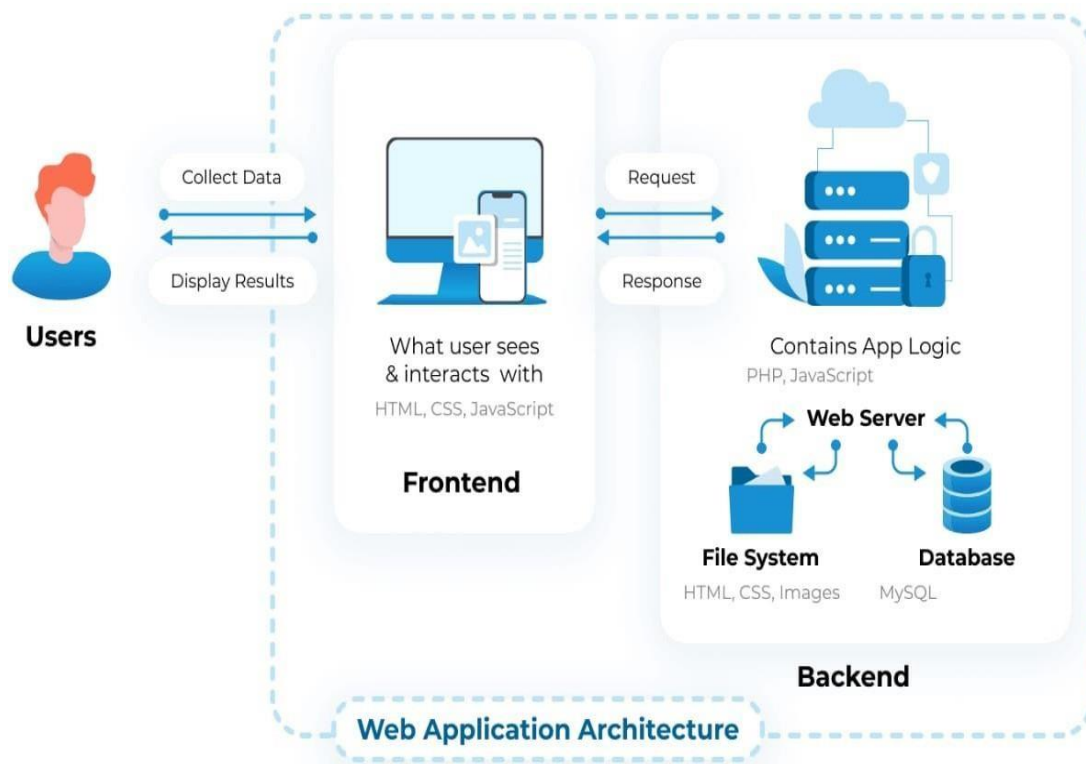


Figure 4.3: Architecture

This PTMPL Website Architecture consists of several parts, including a user interface, an admin panel, a database, and so on. Web application architecture outlines the linkages and manner of interactions between all of these components for a Website.

This System Architecture of PTMPL Advertising consists of two main parts:

1. Users
2. Web Application Architecture

1. Users:

- Users can see the user interface of this construction site. Users can collect the data or information about the flats and plots.

2. Web Application Architecture:

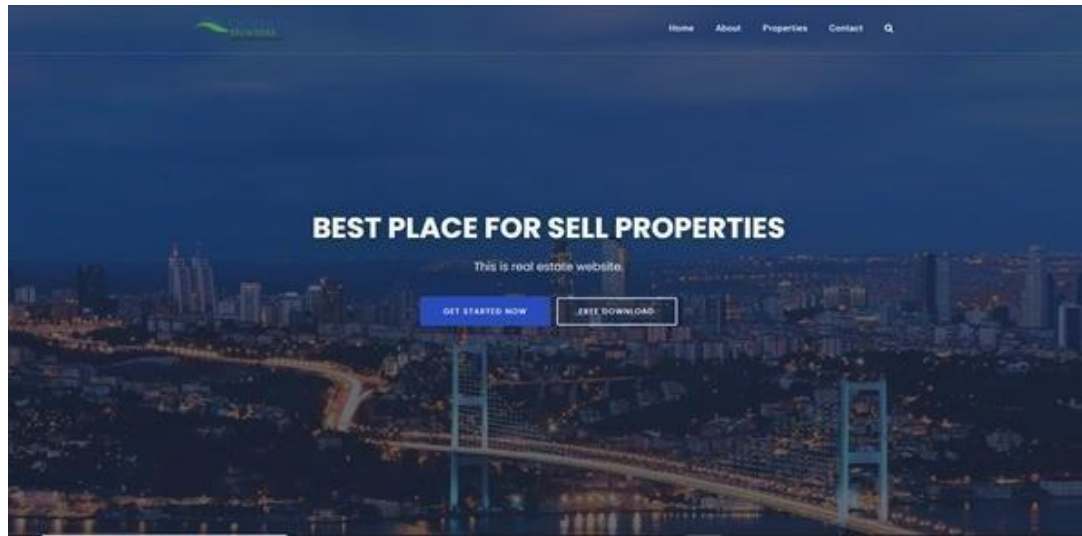
- This component consists of the important parts of this construction website that are: frontend and backend
- Frontend of this system has an interface that can be interacted with by users and also includes an interface for admin that is only accessible for the admin.
- Backend of this system has a phpMyAdmin database. The database is connected to the user interface or frontend of the system. The frontend can send a request to access any part of the user interface and the backend gives that response to the user while accessing the user interface.
- Backend also has a web server and connects application logic written with PHP7.

CHAPTER 5

RESULT AND CONCLUSION

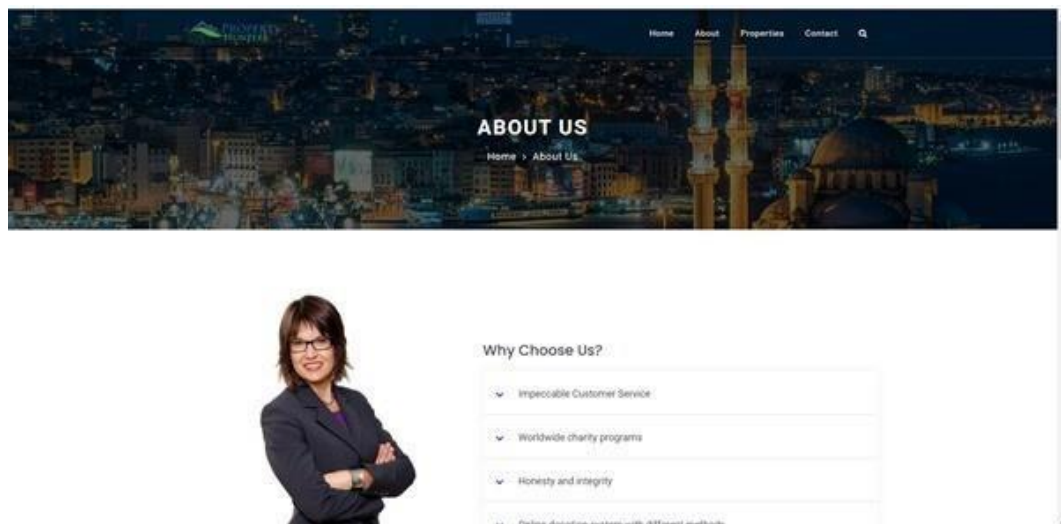
SYSTEM PHOTOGRAPHS

Home Page:



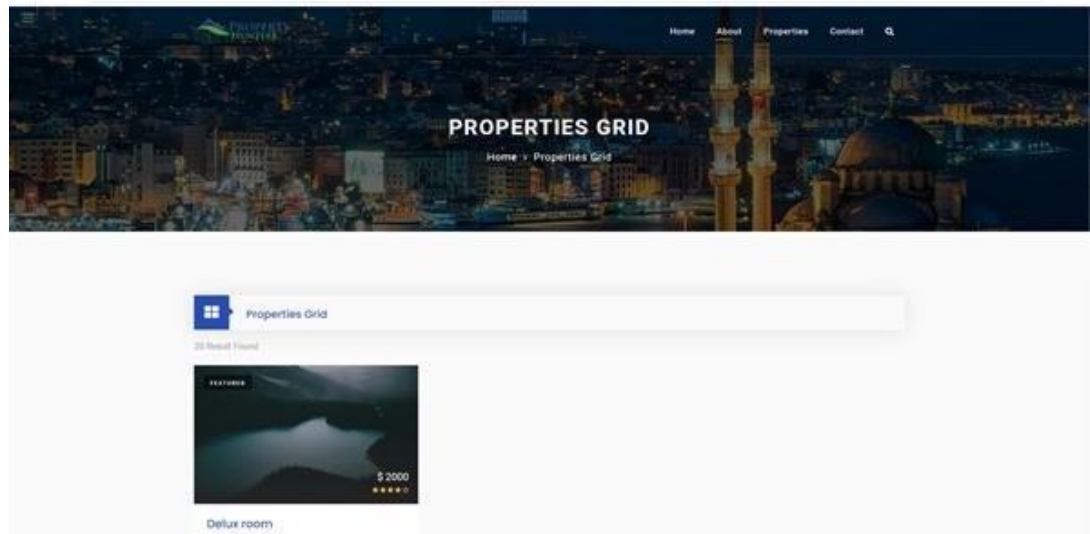
Once user enters the website, the Web browser is scripted by using PHP script will appear as above. The Web browser is a tool where the clients interact with the databases. Referring to above figure, users may view the menu links provided by this system consist of homepage, about, sample of images and ability to add new work details.

About Us:



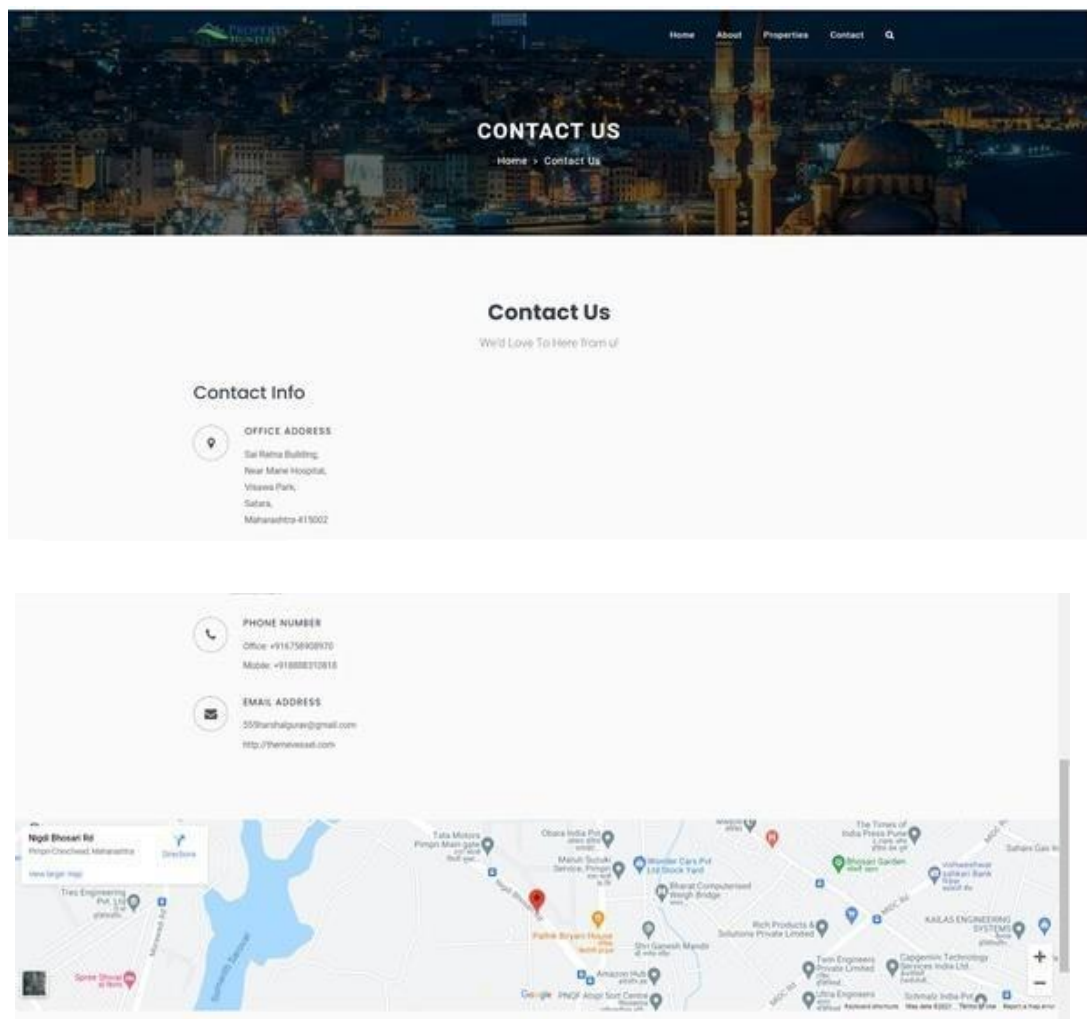
About Us page contains information about the customer services and key factors.

Properties :



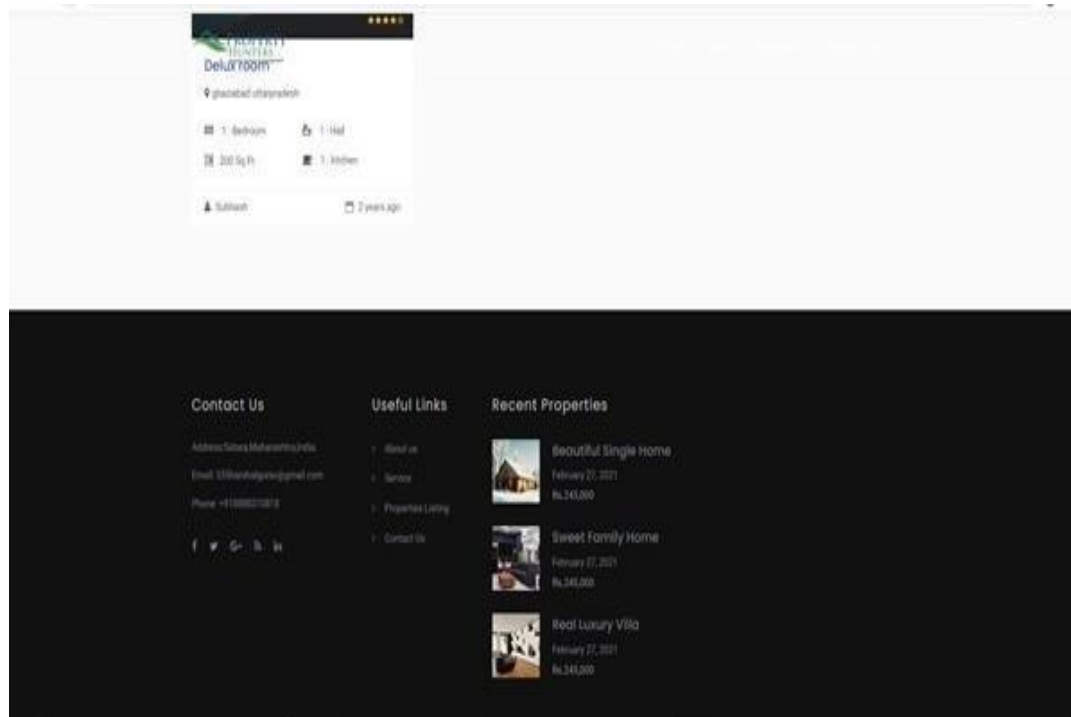
This page contains information of various construction properties that are added by the admin.

Contact Us:

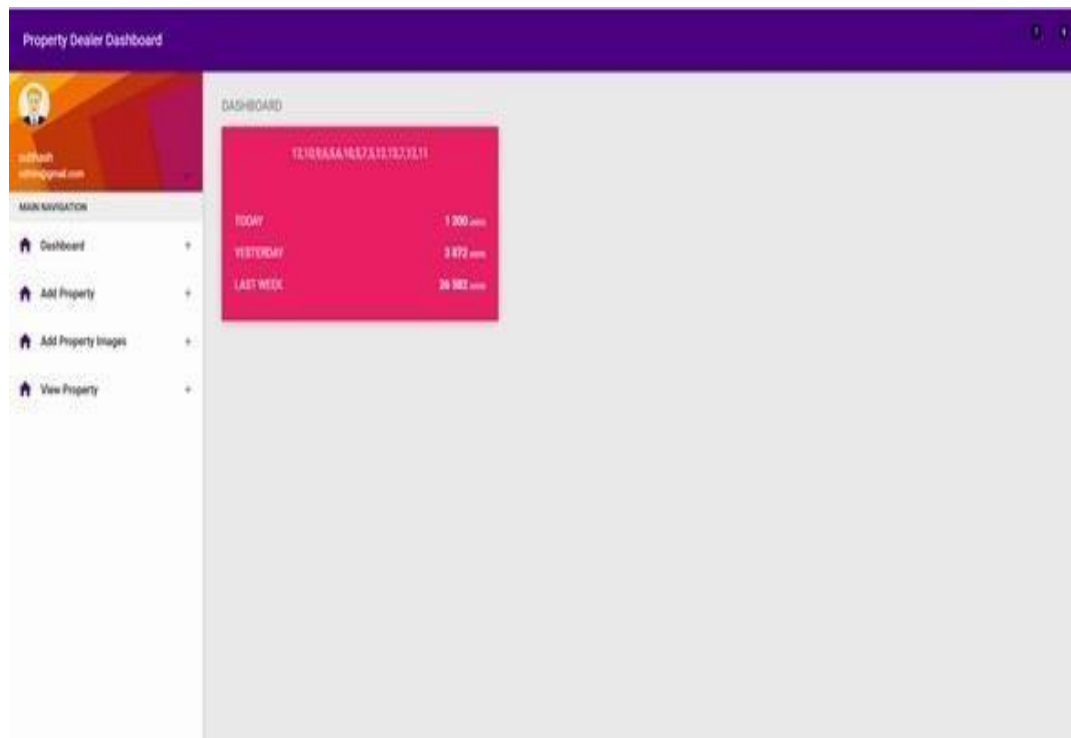


The contact page contains the contact information.
AGCE Satara, Department of Computer Science and Engineering 16

Footer.php:



Dashboard:



In the dashboard section, there are various options available through which the admin can add/delete properties, images or can view the added properties.

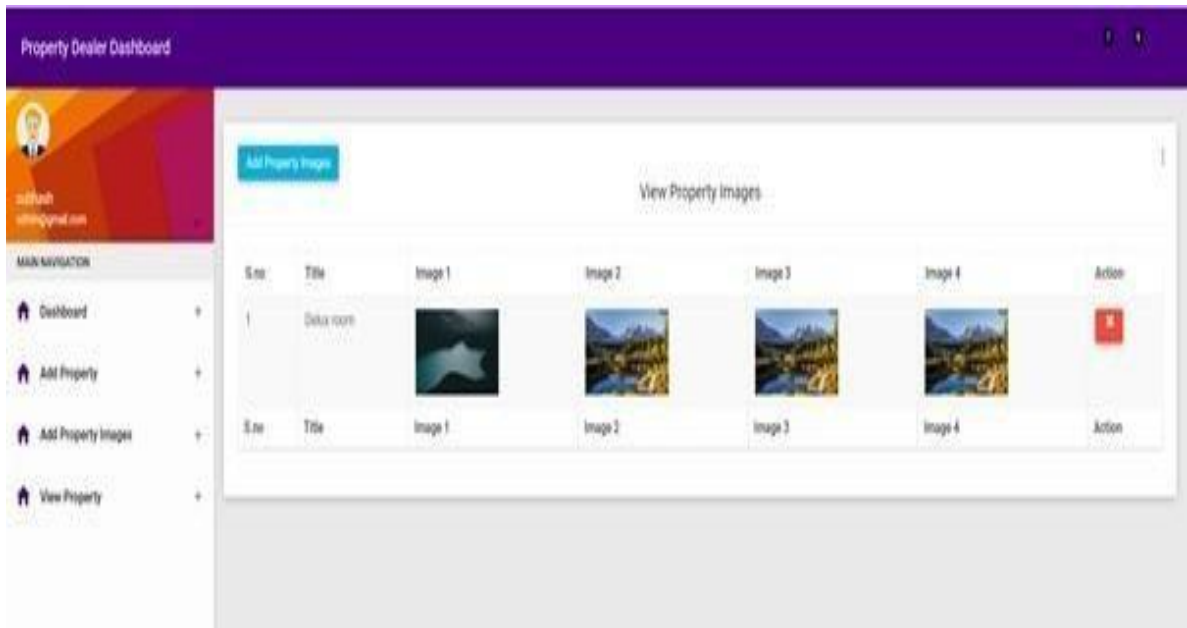
Add Property:

The screenshot shows the 'Add Property' form in a web application. The dashboard has a purple header with the title 'Property Dealer Dashboard' and a user profile on the left. The left sidebar contains a 'MAIN NAVIGATION' menu with options: Dashboard, Add Property, Add Property Images, and View Property. The main content area is titled 'Add Property' and contains the following fields:

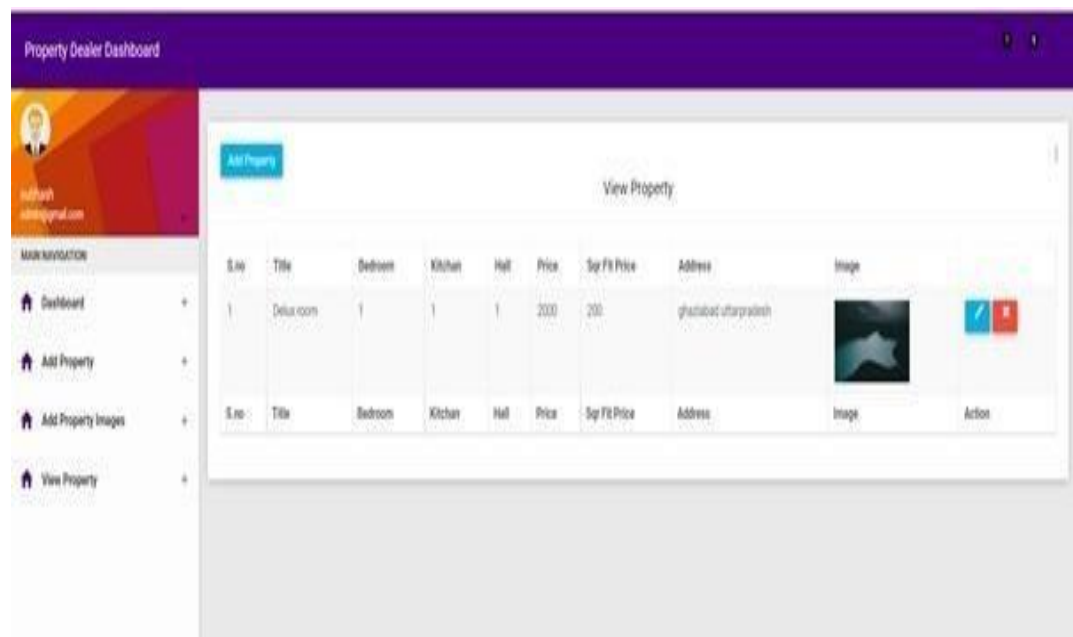
- Property Title
- Property Owner
- Property Type
- Property List Size
- Sold: YES (selected) / NO
- Land area
- Price
- Sq Ft Price
- Address
- Description
- Add Video Link
- Add Location Link
- Add Property Image: Choose Files (No file chosen)
- Condition

This screenshot shows the same 'Add Property' form, but with additional fields visible below the 'Condition' field:

- Kitchen
- Hall
- Bedroom
- Bathroom
- Verandah
- A blue 'Submit' button is located at the bottom right of the form.



view Image



RESULT

We now have an interactive, flexible, and useable website as a result of our work. The Web browser is a tool where the clients interact with the databases. We can now pick out all those things in this work after applying these superb and swift responsible things additions. Xampp is utilized as a local server, while the PHP programming language is used for the development.

CONCLUSION

- Using this web portal, construction processes are carried out partially, smoothly, and effectively as it provides online registration, verification of details, modification of projects details.
- Through this web portal admin can monitor and generate reports of all the activity.
- This website effectively contributes digital India mission by spreading facilities through remote access.
- This web portal also contributes to protecting the ecosystem.

FUTURE SCOPE

Purchasing of products can be implemented through a website by using a payment gateway. Year-ending audit reports can generate in future.

CHAPTER 6

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- 3 Natalya Prokofyevaa , Victoria Boltunovaa,*a Riga Technical University, 1 Kalku Street, Riga, LV-1658, Latvia," Analysis and Practical Application of PHP Frameworks in Development of Web Information Systems" , ICTE 2016, December 2016
- 4 Punam Kumari and Rainu Nandal ,M.Tech Research Scholar,MDU, Rohtak, Haryana , Asst. Prof, M.Tech, MDU, Rohtak, Haryana, India "A Research Paper On Website Development Optimization Using Xampp/PHP" Volume 8, No. 5, May-June 2017 International Journal of Advanced Research in Computer Science
- 5 Elisaveta Trichkova," Application of PHP and MySQL for search and retrieval Web services in Web information systems",Institute of Computer and Communication Systems - BAS Acad. G. Bonchev str., bl.2, tel. 979 27 74, 1113 Sofia, Bulgaria.
- 6 Er. Saurabh Walia , Er. Satinderjit Kaur Gill , 1.Student (M.Tech) CSE, Eternal University, Akal school of post graduate studies Baru Sahib, Himachal Pradesh, 173101, India ,2.Assistant Professor, Eternal University, Akal school of Post graduate studies, Baru Sahib, Himachal Pradesh, 173101, India " A Framework for Web Based Student Record Management System using PHP". IJCSMC, Vol. 3, Issue. 8, August 2014

- 7 Xiaosheng Yu and Cai Yi , College of Computer and Information Technology
China Three Gorges University Yichang, China “Design and Implementation
of the WebSite Based on PHP MYSQL”, ©2010 IEEE

WEBSITES

- 1 <https://www.executionists.com/definition-document-samples>
- 2 <http://cty.jhu.edu/ctyonline/courses/computerscience/introwebdesign.html>
- 3 <https://www.macronimous.com/resources/web-development-life-cycle.asp>
- 4 <https://www.sitepoint.com/successful-development/>

ANNEXURE A

APPENDIX

APPENDIX I

SYNOPSIS

Project Title : “Web Development For PTMPL Advertising”

Problem Statement:

In its most widely used context, construction covers the processes involved in delivering buildings, infrastructure and industrial facilities, and activities through to the end of their life. On the Builders website we can get information related to flats and plots. And also other advertisings.

Introduction:

The Internet is an important source to get information about everything in human lives. Developing websites is one of the best ways to give information to people. Nowadays, there is a rapidly growing number of websites for many purposes. Usually, we have websites to provide information to human beings. In its most widely used context, construction covers the processes involved in delivering buildings, infrastructure and industrial facilities, and activities through to the end of their life. On the Builders website, we can get information related to flats and plots and also other advertisings. Builders build commercial as well as industrial buildings. They also do renovations, excavations, and demolitions. More specifically, builders do particular tasks in construction, including manual labor and operating machinery.

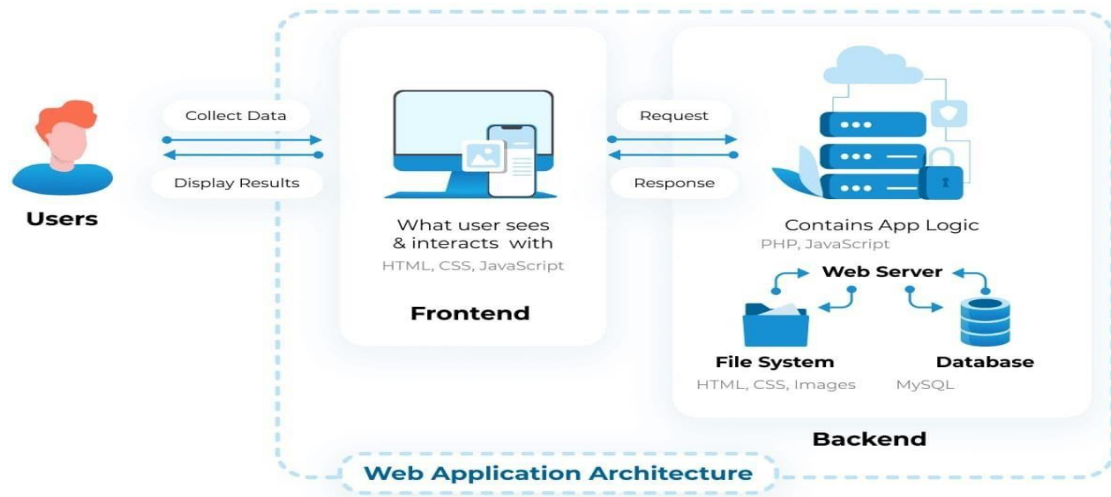


Fig.System Architecture

Frontend:

Frontend consist the home page which has following pages:

- **About us:**

This page contains information about the customer services and key factors.

- **Properties:**

This page contains the data of ready plots and flats.

- **Contact Us:**

This page includes the contact information like telephone no., head office and branch address and location of rudra construction.

Admin panel:

It consists the following pages:

- **Dashboard**

It contains the data added to the website.

- **Add property**

In this page admin can add the properties. Admin can add properties by filling details present in the page.

- **Add property images**

Admin can add the images of sites, plots and flat.

- **View property**

Admin can view the properties added by him.

Backend:

- Backend consists the phpMyAdmin database, xampp server to store the data.

APPENDIX II

(Base Paper)

A Development of Online Database System for Rubber Tree Leaf Diseases

Syed Farid Syed Adnan, Noor Ezan Abdullah, Hadzli Hashim, Yuslinda Wati Mohamad Yusof, Mohammad Yaakub Sidik Malim

Faculty Faculty of Electrical Engineering
University Technology MARA, Shah Alam Selangor

Abstract— This paper presents a database system of the rubber tree leaf diseases which compiled into a Personal Home Page (PHP) script and using Structured Query Language (MySQL). In this work, there are three selected diseases that can be identified using this database system which are *Corynespora* Leaf Spot, Bird's Eye Spot and *Collectrotichum* Leaf Disease. Initially, the information of Region of Interest (ROI) from each of these three types of diseases based on Red, Green and Blue (RGB) color model from previous experiments will be taken as the input to the database system. By using PHP, a server-side language which sends Web pages to requesting visitors (you, the client, with your Web browser). When a visitor goes to a website written in PHP, the server reads the PHP code and then processes it according to its scripted directions. The client also able to fill in the data through the system online and the database system output will identify the diseases based on user data input. The purpose of development of this system is to help new users to identify the types of rubber tree leaf diseases whereby it is consists of data collection, stored and kept organized by the Database Management System. Therefore, by using the database system, this may assist the client on identifying the diseases by comparing their records with the available information. While the advantage of this system is it may help new users to study the characteristics of the diseases without referring to the expertise since the information is consists of sample of images and its symptoms.

Keywords- database,; RGB; Rubber Tree Leaf Diseases; MySQL; PHP.

I. INTRODUCTION

Database system has been used in various types of services, records and store data. Structured Query Language (MySQL) has been used to store or create new data for its client [1]. From the previous works, database programmer used MySQL to construct their database and put it into a one single table. For an example, www.lelong.com.my [9] utilized MySQL technique to develop their online shopping website. Programmers are used to perform their final tests on excerpts from the on-going production databases.

MySQL is the world's most popular open-source database. In fact, today MySQL is a viable competitor to the pricey goliaths such as Oracle and Microsoft's SQL server. Like PHP, MySQL offers excellent performance, portability, and reliability with moderate learning curve and little to no cost.

MySQL is a database management system (DBMS) for relational databases. A database in the simplest terms is a collection of data, be it text, numbers, or binary files stored and

kept organized by the DBMS. There are many type of databases from the simple flat-file to relational and object-oriented. A relational database uses multiple tables to store information in its most discernible parts. The MySQL software consists of several pieces including the MySQL server (mysqld) which runs and manages the databases and the MySQL client (which provide the interfaces to the server) and numerous utilities for maintenance and other purposes.

The main server consists of three functional servers, a File Transfer Protocol (FTP) server for data reception, a World Wide Web (WWW) server for data processing and retrieving, and a database server for database management. All data processing and web functions were implemented in PHP and MySQL. The information can be stored up to billion and trillions of data.

The quality and quantity of the rubber tree products should be maintained in order to meet the market demands. In order to sustain the production of rubber tree products, the prevention should be prior applied from the diseases that may affected on leaves, branches, roots and others. Since the conventionally determination process of rubber tree leaf diseases is time consuming and may requires manual inspection and at the same time it may caused low percentage of accuracy happened when comparing to the closest appearance [2,3,10,11] . Hence, it is strongly recommended to design a database system for accessing the leaf diseases information rapidly.

Therefore, this work purposes an online database system for helping new users to identify the rubber tree leaf diseases including their symptoms. It consists of the development of a web-based data access system which the user/clients can access the real-time database system of rubber tree leaf diseases. The preliminary stage is to compile the databases into the system and then the architecture of MySQL is introduced. The paper is organized as follows: Section II defines the structure and function of PHP and MySQL. Section III explains the methodology process for this work.

II. STRUCTURE AND FUNCTION OF PHP AND MYSQL

When a user goes to a Website written in PHP, the servers reads the PHP code and process it according to its scripted directions. Figure 1 illustrates the client/server process [1, 3, 10, 11].

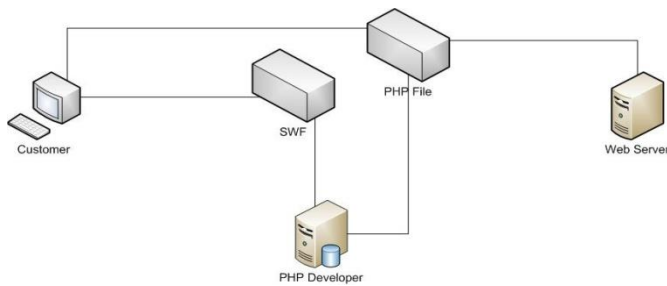


Figure 1: The client/server process when a request for a static HTML page is made.

Personal Home Page (PHP) is often used when it comes to developing dynamic Websites, whereby PHP is faster, better and easier to learn than the alternatives. MySQL is a database management system (DBMS) for relational database. A database in the simplest terms, is a collection of data, be it text, numbers, binary files, stored and kept organized by the DBMS [1,3].

There are many types of databases, from the simple flat-file to relational and object-oriented. A relational database uses multiple tables to store information in its most discernible parts. While relational databases may involve more thought in the design and programming stages, and improved reliability and data integrity that more than makes up for the extra effort required. Figure 2 shows the MySQL data types [4].

DATA TYPES	MySQL	MySQL FUNCTIONS IN PHP	Control Flow
CHAR	String, length 0 - 255	mysql_affected_rows	IFNULL
VARCHAR	String, length 0 - 255	mysql_close	NULLIF
TINYTEXT	String, length 0 - 255	mysql_connect	IF
TEXT	String, length 0 - 65535	mysql_data_seek	String
BLOB	String, length 0 - 65535	mysql_db_name	ASCII
MEDIUMTEXT	String, length 0 - 16777215	mysql_errno	ORD
MEDIUMBLOB	String, length 0 - 16777215	mysql_error	CONV
LONGTEXT	String, length 0 - 4294967295	mysql_fetch_array	BIN, OCT, HEX
LOBLOB	String, length 0 - 4294967295	mysql_fetch_assoc	CHAR
* TINYINT	Integer, -128 to 127	mysql_fetch_field	CONCAT
* SMALLINT	Integer, -32768 to 32767	mysql_fetch_lengths	CONCAT_WS
* MEDIUMINT	Integer, -8388608 to 8388607	mysql_fetch_object	LENGTH
* INT	Integer, -2147483648 to 2147483647	mysql_fetch_row	CHAR_LENGTH
* BIGINT	Int, -9223372036854775808 to 9223372036854775807	mysql_fetch_flags	BIT_LENGTH
Float	Decimal (precise to 23 digits)	mysql_field_len	LOCATE
DOUBLE	Decimal (24 to 53 digits)	mysql_field_name	INSTR
DECIMAL	"DOUBLE" stored as string	mysql_field_seek	LPAD
DATE	YYYY-MM-DD	mysql_field_table	RPAD
DATETIME	YYYY-MM-DD HH:MM:SS	mysql_field_type	LEFT
TIMESTAMP	YYYYMMDDHHMMSS	mysql_free_result	RIGHT
TIME	HH:MM:SS	mysql_insert_id	SUBSTRING
ENUM	One of preset options	mysql_list_dbs	MID
SET	Selection of preset options	mysql_list_processes	SUBSTRING_I
		mysql_list_tables	LTRIM
		mysql_num_fields	RTRIM
			TRIM
			SOUNDEX
			SPACE
			REPLACE
			REPEAT
			REVERSE
			INSERT
			ELT
			FIELD
			LCASE
			UCASE
			LOAD_FILE
			QUOTE

Figure 2: MySQL data types

III. METHODOLOGY

A. Data Collection

In this work, there are three major types of rubber trees leaf diseases were selected for this study which are known as Corynespora, Bird's Eye Spot and Collectotrichum and the se data were taken from the previous experiment. These samples were collected from the nursery at the Malaysian Rubber Board (MRB), Sungai Buloh, Selangor, Malaysia. These quatitative and qualitative information were acquired from the Region of Interest (ROI) of the diseases which is based on RGB pixel color indices by cropping the identified infected area as shown in Figure 3[2].



(a) Original image



(b) cropping sample

Figure 3: Shown the cropping an image; (a) original image, (b) cropping sample.

A total number of data consist of 902 samples represented by 500 samples for Corynespora, 249 for Bird's Eye Spot and another 493 for Collectotrichum. Figure 4 shows the three types of rubber tree leaf diseases [2,6].



(a)



(b)



(c)

Figure 4: Types of Rubber Tree Leaf Disease (a) Corynespora (b) Bird's Eye Spot (c) Collectotrichum

B. Databases System Framework

Framework of the development of database starts with designing a database. Accessing MySQL is a crucial part where the data is kept in the database. The process of configuration the database is by using phpMyadmin. Database is then created by creating tables and database name. The next part is inserting records and selecting data. The next stage is to use PHP command line to instruct the database of what it should do by reading the command written. The final stage is process of connecting to the database, recalled the database and will show the query results as shown in Figure 5.

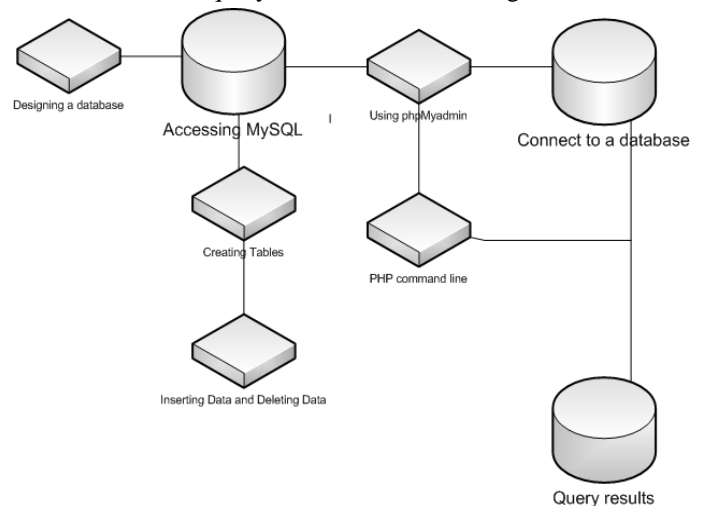


Figure 5: Framework of database system.

C. Designing a Database

The designing of the information in the database needs to be identified before working with the databases construction. Table I tabulates the population of databases for each diseases.

TABLE I: DATA FROM PREVIOUS WORK AND DATA USED IN THE DATABASE SYSTEM

Number Of Image	Number of Samples (n)	Number of Database (n)	Data Used In Database (n)
Bird's Eye Spot	301	249	249
Collectrotichum	493	153	153
Cornynespora	455	500	500

The databases are including the sample of images, the characteristics for each disease and its symptoms. These diseases were then renamed as `rgb_cor1` and `rgb_cor2` for Corynespora, `rgb_bes` represent the Bird's Eye Spot and `rgb_coll` for Collectrotichum.

D. Accessing MySQL

The first task in accessing MySQL is to create a command line where the command line is represent by `"/mysql -u root -h localhost -p"` used for accessing the MySQL. Figure 6 shows the constructed command line to access the MySQL server [3,6].

```
john@john:~$ mysql -u root -h localhost -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 595
Server version: 5.5.22-0ubuntu1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Figure 6: Command line to access MySQL

E. Using phpMyAdmin

PHP *sole purpose* is to provide an interface to the MySQL server. It is somehow easier and more natural to use compared to the MySQL client however it may requires a PHP installation and must be accessed through a Web browser. The uniform resource locator (URL) for phpMyadmin is localhost or phpMyAdmin. Figure 7 shows the phpMyAdmin page.

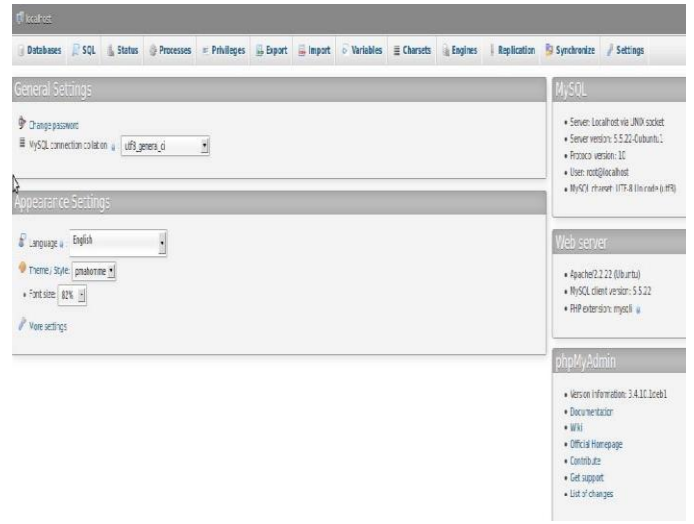


Figure 7: The phpMyadmin page (when connected as a MySQL user that can access multiple databases)

F. Creating Databases and Tables

The next stage is to create the databases and tables in the system. The syntax for creating a new database is simply as follows;

“CREATE TABLE tablename (column1name description, column2 name description...)”

G. Inserting Records

The *INSERT* command is used in order to insert the databases and tables that have been created previously. There are two ways on writing the *INSERT* query where the first method is by naming the columns to be populated.

“INSERT INTO tablename (column1, column2,...) VALUES (value1,value2,...) INSERT INTO tablename (column4, column8,) VALUES (valueX, valueY)”

Instead of inserting records into columns, the second format is to substitute the values for every case:

“INSERT INTO tablename VALUES (value1, NULL value2,value3...)”

The values need to be specifying even if it's NULL for every column. Failure to match the number of values to the number of columns will cause an error. Figure 8 depicts the process of inserting the records using the second method.


```

INSERT INTO `Table` VALUES
('66.00','68.00','81.00','99.00','76.00','75.00','74.00',
'106.00','88.00','88.00','115.00','85.00','98.00','103.00',
'85.00','77.00','71.00','93.00','48.00','70.00','48.00',
'84.00','86.00','54.00','66.00','68.00','48.00','79.00',
'54.00','54.00','84.00','100.00','72.00','74.00','92.00',
'62.00','86.00','63.00','57.00','50.00','59.00','76.00',
'80.00','85.00','87.00','79.00','58.00','77.00','87.00',
'81.00','85.00','124.00','58.00','85.00','102.00','44.00',
'89.00','58.00','61.00','94.00','110.00','51.00','40.00',
'75.00','54.00','41.00','42.00','72.00','47.00','55.00',
'87.00','50.00','59.00','77.00','78.00','65.00','73.00',
'134.00','87.00','98.00','95.00','57.00','57.00','81.00',
('66.00','68.00','81.00','99.00','76.00','75.00','74.00',
'106.00','88.00','88.00','115.00','85.00','98.00','103.00',
'85.00','77.00','71.00','93.00','48.00','70.00','48.00',
'84.00','86.00','54.00','66.00','68.00','48.00','79.00',
'54.00','57.00','84.00','100.00','72.00','74.00','92.00',
'62.00','86.00','54.00','57.00','50.00','59.00','76.00',
'80.00','85.00','87.00','79.00','58.00','77.00','87.00',
'81.00','85.00','124.00','58.00','85.00','102.00','44.00',
'89.00','58.00','61.00','94.00','110.00','51.00','40.00',
'75.00','54.00','37.00','42.00','72.00','47.00','55.00',
'87.00','50.00','59.00','77.00','78.00','65.00','73.00',
'134.00','87.00','98.00','95.00','57.00','59.00','81.00',
'134.00','87.00','98.00','95.00','57.00','59.00','81.00',

```

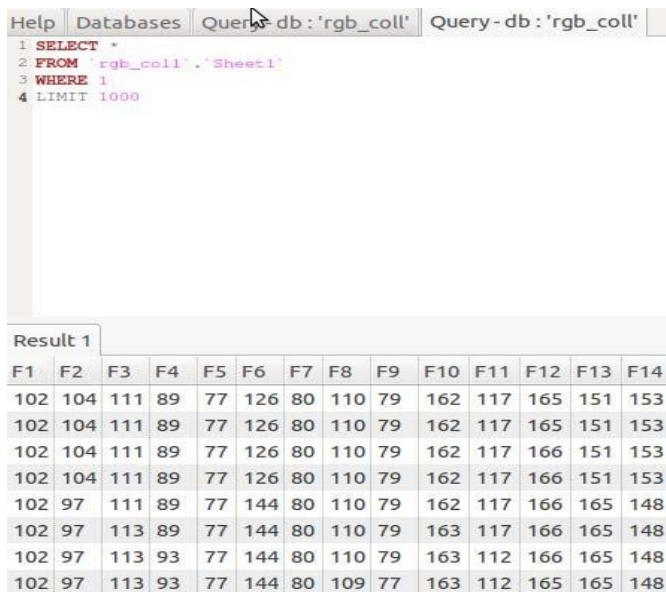
Figure 8: Inserting a record using the second method

H. Selecting Data

The next stage is the retrieving process of the stored information with the most used of all SQL terms, *SELECT*. A *SELECT* query may possibly returns rows of records using the following syntax.

“*SELECT * FROM tablename.*”

Figure 9 shows the records in the database using the *SELECT* query.



F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
102	104	111	89	77	126	80	110	79	162	117	165	151	153
102	104	111	89	77	126	80	110	79	162	117	165	151	153
102	104	111	89	77	126	80	110	79	162	117	166	151	153
102	104	111	89	77	126	80	110	79	162	117	166	151	153
102	97	111	89	77	144	80	110	79	162	117	166	165	148
102	97	113	89	77	144	80	110	79	163	117	166	165	148
102	97	113	93	77	144	80	110	79	163	112	166	165	148
102	97	113	93	77	144	80	109	77	163	112	165	165	148

Figure 9: Part of *SELECT* query to show records in the database

I. Connect To a Database

In order to ensure the database is functioning properly, thus it is important to connect them into a server. It requires appropriately named *mysqli_connect()* function. The first arguments will be sent to the function (hostname, username, password and database name) based on the users and

privileges established within MySQL. By using PHP, a command line is scripted.

```

<?
$username="root";
$password="database1";
$dbase="rgb_coll";
?>

```

Then the file will be saved into *dbinfo.inc.php* whereby this command will be used to connect to database. The sample of command line used for connecting to the database is as follows:

```

<?include("dbinfo.inc.php");
mysql_connect(localhost,$username,$password);
@mysql_select_db($dbase) or die( "Unable to
select.database");
?>

```

J. Query Result

The final task in this work is to design the query results. The queries can be as basic as inserts, updates, and deletions or as involved as complex joins returning numerous rows. Regardless of the SQL command type, the PHP function for executing a query is *mysql_query()*.

```

$query="SELECT * FROM Sheet1";
$result=mysql_query($query);
$num=mysql_numrows($result);

```

IV. RESULTS AND DISCUSSIONS

This section will discuss the results of the online database system. Once user enters the website, the Web browser is scripted by using PHP script will appear as shown in Figure 10.

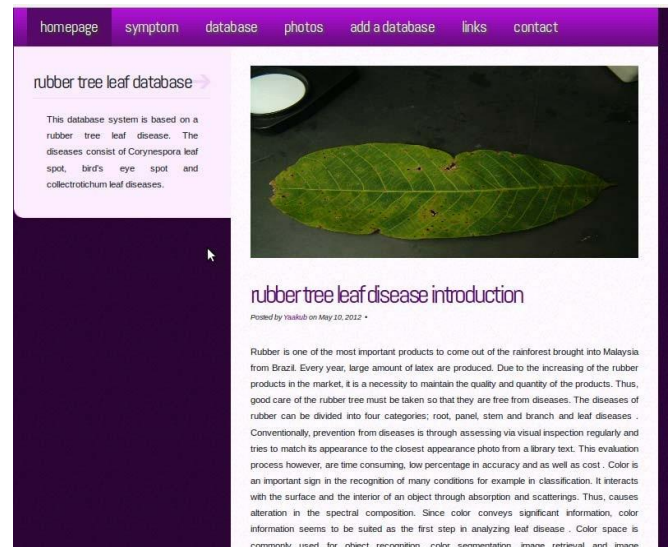


Figure 10 Homepage of a Web browser using PHP script.

The Web browser is a tool where the clients interact with the databases. Referring to Figure 11, users may view the menu links provided by this system consist of homepage, symptoms, a group of databases, sample of images and ability to add new database.

First information that could be access by the clients is the symptom link where it is consists of briefly information the characteristics for each rubber tree leaf diseases as can be seen in Figure 11.



Figure 11 Part of a rubber tree leaf disease symptom

As for the query result, the client can choose which database that can be displayed in the Web browser. The following Figure 12 to 13 depicts the query result of the database. The client can chose which data to be displays in the databases system. There are 4 selections of databases that can be choosing to be viewed as shown in Figure 12.

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	37	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	37	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	61	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	100	102	77	61	73	35	49	101	84	41	47	73	42	31	55	5
17	9	16	13	26	48	11	94	6	21	130	46	118	72	100	102	77	61	73	35	49	79	84	41	47	73	42	31	55	5
17	9	16	13	26	68	27	94	4	21	130	71	118	72	100	104	77	61	79	33	73	79	71	41	47	73	42	31	61	5
17	9	26	7	26	68	27	94	4	118	115	71	134	72	100	104	77	75	79	33	73	79	71	41	47	79	42	31	61	5

Figure 12 Query result shows collection of data which infects the leaf. The client can identify the data based on the specified rubber tree leaf diseases

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24	F25	F26	F27	F28	F29	F30
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	37	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	37	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	62	102	78	61	73	35	49	101	84	41	47	73	17	56	55	21
22	9	16	13	14	48	11	94	6	21	130	46	123	63	100	102	77	61	73	35	49	101	84	41	47	73	42	31	55	5
17	9	16	13	26	48	11	94	6	21	130	46	118	72	100	102	77	61	73	35	49	79	84	41	47	73	42	31	55	5
17	9	26	7	26	68	27	94	4	21	130	71	118	72	100	104	77	75	79	33	73	79	71	41	47	79	42	31	61	5

Fig. 13: A part of Bird's Eye Spot query result shown in the Web browser

Another feature in this system is the user able to insert resource for new information of rubber tree leaf diseases including the data collection, symptoms and images by adding new tables and creating new databases in the Web browser.

V. CONCLUSIONS

In this work, an online database system, for rubber tree leaf diseases is presented. Based on the database system, the client can identify the diseases that infected the rubber tree leaf by observing the collection of data shown in the databases. On the other hand, this system may assist the client on identifying the diseases by comparing their records with the available information. While the advantage of this system is it may help new users to study the characteristics of the diseases without referring to the expertise since the information is consists of sample of images and its symptoms.

VI. FUTURE RECOMMENDATIONS

This database system can be improved by using paid SQL server where more features can be added into the database. Since MySQL is an open source whereby there is a limitation on the database command and script.

Besides that, it is suggested to upgrade the system with integrated software such as add into the mobile phone applications. This would give the user/clients the mobility to serve the website from the field.

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Reference Paper

An Empirical Study of Three PHP Frameworks

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Abstract— In recent years, there are many PHP frameworks for developers to choose. The developers should know how to choose the most suitable framework with the best support features to use in their project. For that reason, good understanding of different frameworks becomes an essential requirement for web developers nowadays. This study conducted a series of experiments to compare the performance and reusability of three selected frameworks by implementing the same token web application using three PHP frameworks: CakePHP, Laravel and CodeIgniter respectively. In terms of performance, CodeIgniter performed the best for the three tasks. Laravel performed the best for one of the tasks and performed the worst for one of the other tasks. In general, CodeIgniter has the best performance and Cake PHP has the worst performance. In terms of reusability, CakePHP has the highest score. This suggested that the performance and the reusability are not in proportional relationship. There could be a number of reasons for this. Regular expressions were used to detect reusability data from the code. These regular expressions cannot deal with repeat variable occurrences which may result in inaccuracy of the reusability score. Further research is required. In the future, more frameworks should be included to get the general guidelines for PHP framework evaluation. More factors should be considered in the PHP framework measurements.

Keywords—PHP frameworks; experiment; measurement; evaluation; comparison

I. INTRODUCTION

PHP is considered as one of the most popular scripting languages to be used in developing web applications due to the fact that it is dynamic, provides a large amount of flexibility, it's easy to use and is easy to learn [1]. However, sometimes coding in PHP become a repetitive task. Moreover, the easiness to apply PHP into projects also leads inexperienced developers to unorganized code process that they do not even notice.

PHP frameworks come into the picture to help developing web application smoother and faster by providing a template basic structure, along with a completed set of built-in APIs, libraries and numerous of extensions (which are developed by framework creators or the community). In other words, frameworks can speed up developing process, cut off developing time, help developers be more productive by reducing repetitive code in the project. The final application created by frameworks will be more stable and secure.

In recent years, there are many PHP frameworks for developers to choose from such as *Laravel*, *CakePHP* and *CodeIgniter* etc. In fact, in real world working environment, developers will not write every single line of code while building applications, but instead they use frameworks to optimize their tasks. Therefore, developers should know how to choose the

most suitable framework with the best support features to use in their project. For that reason, good understanding of different frameworks become an essential requirement for web developers nowadays.

This issue usually ends up with questions like: What is the best framework to use? Or, what are pros and cons of different PHP frameworks? How to know which framework is the most suitable for a project? And many more.

For that purpose, this study conducted a series of evaluations and experiments to compare the performance, efficiency and reusability on three selected frameworks that were used in workplaces popularly in 2013 to help web developers understand PHP frameworks and making decisions in selecting PHP frameworks for their projects. [2]. Most comments regarding PHP frameworks are based on the subjective observations and qualitative analysis. Recently, there were a few studies on PHP frameworks evaluations and comparisons. The study of [3] explored the relationship between a framework and the effort it takes to develop a web application. The study of [4] compared and analyzed the impact of data abstraction layer (ORM) on the performance of two PHP frameworks CakePHP and CodeIgniter.

The intention of this research was to work out a complete set of measurements for the evaluation of six popular frameworks, which can be further refined into a PHP framework evaluation formal procedure. Ultimately, a guideline for developers in choosing and applying frameworks in their workplace or personal projects will be provided. This paper presents the first phase of the research, where three frameworks were considered, and the measurements were focusing on the performance and reusability. The results should be useful for PHP developers and could be improved in the next phase of the research.

By implementing the same token web application using three selected PHP frameworks: CakePHP, Laravel and CodeIgniter respectively, the research provided understanding on how each framework was used in process and the technical details to evaluate the performance of each framework using time measurements for different tasks. The results were analyzed qualitatively.

In the rest of this paper, the related research is discussed first, which is followed by the experiment design, data collection and analysis. Finally, the summary and future work are given.

II. RELATED RESEARCH

Five general criteria that developers use to select a framework were indicated by [3]. They are architecture, documentation, community support, flexibility or whether they

possess a list of features. While these criteria are essential, they are not task specific and lack of implementation details. They don't provide deeper help on making decision for a concrete web application. In [3], a method using source lines of code as a comparative metric to evaluate PHP MVC frameworks and determine the differences in effort required to implement the fundamental components of a web application was developed.

According to [4], PHP frameworks can considerably improve the performance of an application. These frameworks usually are based on Model, View, and Controller design pattern. These frameworks provide, different common functionalities and classes in the form of helpers, components, and plug-in to reduce the development time. Due to these features such as robustness, scalability, maintainability and performance, these frameworks are mostly used for web development in PHP, with performance being the most important factor. [4] reported the research on comparing and analyzing the impact of data abstraction layer (ORM) on the performance of CakePHP and CodeIgniter. Load testing and stress testing were used to measure the performance. The results of [4] showed that there is not much of a difference, as per as the performance of CakePHP and CodeIgniter was concerned, with the respect to response time on a live server. CodeIgniter had better performance with respect to throughput on live server.

[5] indicated that although PHP dynamic features can give the developers great flexibility, they could have a negative impact on performance.

According to [6], database connection is very important for a PHP framework. What happens when multiple parts of your application need to interact with the database? Surely that database-related code shouldn't need to be duplicated in each and every PHP script. The prudent thing to do would be to refactor all database code into a shared PHP file. A developer should really need to worry about opening and closing database connections. The database-related tasks should be included in the PHP framework evaluation experiments.

In software engineering, software metrics are the only tools to control the quality of software [7]. Most of the metrics are developed covering generally programming languages such as C, C++, and Java etc. Some metrics may not be suitable for some programming or scripting languages. There is lack of metric in the literature, which measures the quality of PHP language [7]. In this respect, specific metrics should be developed, and we develop a metric for PHP, which is capable to calculate reusability quality of PHP code. A reusability metric to measure quality of PHP script language (REUphp) was proposed by [7]. Since PHP is an object oriented language, the present metric is capable to evaluate any object-oriented.

Software reuse is the process of implementing or updating software systems using existing software components. Reusability of Object Oriented Programming is the use of previous classes or functions or methods in the present class but no problem of previous classes. The goal of Reusability quality of PHP code (REUphp) is to evaluate the current state of the art on the reuse metrics area with special emphasis on code-based metrics. It includes the following factors:

(a) Number of include and Number of require (*NIRphp*)

$$NIRphp = \sum NIphp + \sum NRphp \quad (1)$$

where *NIphp* = number of include files and *NRphp* = number of require files.

(b) Number of object inheritance elements (*NOIphp*)

$$NOIphp = \sum NTphp + \sum NEphp + \sum NCCphp \quad (2)$$

where *NTphp* = number of include files; *NEphp* = number of extends and *NCCphp* = number of concrete class.

(c) Class Interface Size (*CISphp*)

$$CISphp = \sum public(NOM) + \sum public(VARS) \quad (3)$$

where *public(NOM)* = number of public methods and *public(VARS)* = number of public variables.

(d) The values of the above defined metrics will become base attributes to evaluate reusability (*REUphp*) of PHP codes.

$$REUphp = \sum NIRphp + \sum NOIphp + CISphp \quad (4)$$

The above formula had been used to calculate the reusability measurements of the PHP framework applications in this study.

[8, 9] indicated that web application frameworks usually implement the Model View Controller (MVC) design pattern. The MVC pattern is a proven and effective way for the generation of organized modular applications. The MVC pattern breaks an application into three modules: model, view and controller. The model module contains the underlying classes whose instances are to be used for manipulating the database, templating frameworks and session management, and they often promote code reuse. All the three PHP frameworks selected for this study implement MVC design pattern.

III. EXPERIMENT DESIGN

Empirical study is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief [10]. A PHP system was developed to conduct the experiments. It consists of a control panel and three PHP applications. The PHP applications are the re-implementation of the same token application by using CakePHP, Laravel and CodeIgniter frameworks respectively. The control panel allows the users to conduct the experiments and to collect data. The same set of measurement points were integrated with each of the applications. The databases for each application were identical as well. Fig. 1 shows an overview of the experiment system architecture. The system was implemented by PHP 5.6 on windows operating system and IIS, and **Database 1**, **Database 2** and **Database 3** were implemented by MySQL server. The management system included an UI allowing access to the applications implemented by CakePHP, Laravel and CodeIgniter respectively.

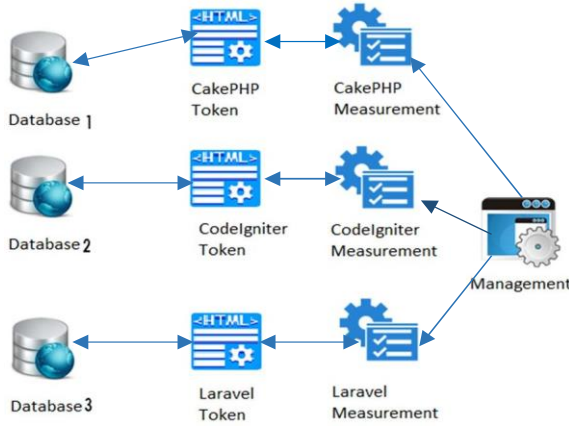


Figure 1. An overview of the experiment system architecture.

The token application integrated minimal necessary features of a web application. These features including: uploading of files, connecting with database, populating data from database, data validation, inserting data into a database, using master page as a template etc.

The experiments could help us to investigate benchmark tasks for next step of research. The following are the tasks used for performance measurements in this study:

- Read/write text files.
- Upload and save images to the web server.
- Retrieve large amount of data from the database and display them in a table.
- Database CRUD operations (connecting to/insert into/delete from/update the database).

Fig. 2 shows the web page from the token application used for large amount data (complex data) processing measurements.

Complex Table				
<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>6</div> <div>7</div> </div>				
ProductName	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder
Chai	10 boxes x 20 bags	18.0000	39	0
Chang	24 - 12 oz bottles	19.0000	17	40
Aniseed Syrup	12 - 550 ml bottles	10.0000	13	70
Chef Anton's Cajun Seasoning	48 - 6 oz jars	22.0000	53	0
Chef Anton's Gumbo Mix	36 boxes	21.3500	0	0
Grandma's Boysenberry Spread	12 - 8 oz jars	25.0000	120	0
Uncle Bob's Organic Dried Pears	12 - 1 lb pkgs.	30.0000	15	0
Northwoods Cranberry Sauce	12 - 12 oz jars	40.0000	6	0
Mishi Kobe Niku	18 - 500 g pkgs.	97.0000	29	0
Ikura	12 - 200 ml jars	31.0000	31	0
Queso Cabrales	1 kg pkg.	21.0000	22	30
Time taken to load records(MilliSeconds):160.43090820312				
Time taken to display records(MilliSeconds):18.0341796875				

Figure 2. A web page from the token application.

Another piece of software called RIPS (<http://rips-scanner.sourceforge.net/>) was used to extract and calculate the reusability measurements. After the URL of the PHP application is provided, the measurements defined in formula (1), (2), (3) and (4) of [7] will be produced. Regular expressions defined in Table I were implemented to help extract the measurements.

TABLE I. REGULAR EXPRESSION USED IN THE EXPERIMENT

Purposes of the REGEX	Regular Expressions
include or require	<code>^((include) (require))</code>
extends	<code>extends</code>
trait	<code>^trait</code>
functions without visibility modifiers	<code>^\s*function[\s\n]+(\S+)[\s\n]*\((</code>
functions with public modifiers	<code>^\s*public\s*function[\s\n]+(\S+)[\s\n]*\((</code>
ALL the variables	<code>\\$([a-zA-Z_\x7f-\xff][a-zA-Z0-9_\x7f-\xff]*)\s*=</code>
variables with private or protected visibility modifiers	<code>(protected\s*\\$([a-zA-Z_\x7f-\xff][a-zA-Z0-9_\x7f-\xff]*)\s*=) (private\s*\\$([a-zA-Z_\x7f-\xff][a-zA-Z0-9_\x7f-\xff]*)\s*=)</code>
concrete classes	<code>^class\s*[\s\n]+\s+</code>

Table I shows the regular expressions used to measure the code reusability in the various cases of a PHP application as defined in [7], where ^ denotes the starting position of the line, hence can be used with 'include' and 'require' etc., but not with 'extends'. There are limitations for the regular expressions defined for variables; they count all the instances of the variable occurrences, e.g. \$var1=x; \$var2=m; \$var1=p; will be counted as 3 not 2, as the regular expressions cannot deal with repeat variable occurrences (i.e. \$var1 was counted twice). The measurements obtained based on these regular expressions contributed to the final reusability measurement for a PHP application by using the formula (1), (2), (3) and (4) defined in the [7].

IV. DATA COLLECTION AND ANALYSIS

In the experiments, identical data were used for all the three PHP applications. The resulting data were collected from the web pages or the resulting excel files. The results are presented in the tables in this section.

A. Reusability Results

Table II shows the final experiment results of reusability for three PHP application using three PHP frameworks CakePHP, Laravel and CodeIgniter respectively. **REUphp** indicates the reusability of a PHP application. **NIRphp** represents the number of **include** and the number of **require** used in the PHP code. **NOIphp** represents the number of object inheritance elements (traits, extends and concrete classes) in the PHP code. **CISphp** represents the **Class Interface Size** (public methods and variables) in the PHP code.

TABLE II. REUSABILITY RESULTS

<i>Framework Used</i>	<i>NIRphp</i>	<i>NOIphp</i>	<i>CISphp</i>	<i>REUphp</i>
CakePHP	97	5896	78331	84324
Laravel	116	7388	51874	59378
CodeIgniter	1	246	5466	5713

Table II shows that the PHP application implemented in CakePHP framework has the highest reusability score 84324 and the PHP application implemented in CodeIgniter framework has the lowest reusability score 5713.

TABLE III. REUSABILITY MEASUREMENTS

<i>Measurements</i>	<i>CakePHP</i>	<i>Laravel</i>	<i>CodeIgniter</i>
files scanned	3763	4700	212
include or require	97	116	1
extends	2480	3266	110
trait	115	110	0
functions without visibility modifiers	989	582	166
functions with public visibility modifiers	20729	19016	997
public functions	21718	19598	1163
ALL of the variables	57899	33926	4626
variables with private or protected visibility modifiers	1286	1650	323
public variables	56613	32276	4303
concrete classes	3301	4012	136

Table III shows the detail measurements for the PHP applications implemented in different frameworks. For CodeIgniter application, the number of files scanned were the smallest (212), as it is a simple PHP framework. However, it has used extremely small number of *include or require* and *trait*, and these reduced the code reusability in CodeIgniter framework and their applications. The CakePHP application has fewer files scanned (3763) than the Laravel application (4700), however, the CakePHP application used more functions, private or protected modifiers and public variables, these made CakePHP framework and its applications have better code reusability than Laravel framework and its applications.

B. Complex Data

TABLE IV. COMPLEX DATA

<i>Operations</i>	<i>CakePHP Time (milliseconds)</i>	<i>Laravel Time (milliseconds)</i>	<i>CodeIgniter Time (milliseconds)</i>
Load	40.2	65.12	18.91
Display	1.7	7.32	0.022

Table IV shows the time for loading data from the database and displaying the data on an HTML table. Laravel application performed the worst in this case. CodeIgniter application

performed the fastest of the three in this case. This could be due to that CodeIgniter is the simplest of the three PHP frameworks considered in this study, therefore, the framework data transferring overhead for this framework is small, thus making CodeIgniter more efficient.

C. CRUD Operations

In this task, three database operations (create a record, update a record and delete a record) were tested for each of the PHP applications. The same data structure and testing data were used for all the applications. Table V shows the results for CRUD Operations.

TABLE V. CRUD OPERATIONS

<i>Operations</i>	<i>CakePHP Time (milliseconds)</i>	<i>Laravel Time (milliseconds)</i>	<i>CodeIgniter Time (milliseconds)</i>
Create	180.85	150.44	98.22
Update	40.62	27.27	12.27
Delete	28.46	14.44	6.74

CodeIgniter application performed the best for the three database operations. CakePHP application performed the worst. This suggested that the database component of CakePHP framework has lower performance than the database component of Laravel framework.

D. Upload Images

A file upload box was used to test the performance of the frameworks when an image is uploaded to the web server. Upon uploading of the image, a report was generated on the server (and stored). This report was also displayed on the browser when the image uploading is finished. A set of 10 image files were selected for testing. The uploaded files were saved to the web server. Table VI shows the results for uploading and saving images.

TABLE VI. UPLOAD IMAGES

<i>File Name</i>	<i>File Size (KB)</i>	<i>CakePHP Time (sec)</i>	<i>Laravel Time (sec)</i>	<i>CodeIgniter Time (sec)</i>
1.jpg	89.83	0.634	0.318	0.605
2.jpg	197.202	1.187	1.541	1.32
3.jpg	309.747	1.683	2.22	1.954
4.jpg	416.139	2.186	2.664	2.672
5.jpg	623.068	5.442	4.702	4.679
6.jpg	1119.395	9.306	8.801	8.321
7.jpg	1398.764	10.654	9.991	10.319
8.jpg	1636.173	13.587	12.574	11.676
9.jpg	1810.801	15.3	13.894	13.192
10.jpg	2046.306	14.58	15.462	14.379
Average		7.4559	7.2167	6.9117

On average, CodeIgniter application performed the best for uploading and saving image files. CakePHP application performed the worst. So, the file uploading and saving component of CakePHP framework has the lowest performance.

E. Read/Write Files

Eight text files were used for testing the reading/writing files. Each of the file was copied (read and written), line by line to another file. The copying of the file was timed. A report was produced at the end containing the time taken for copying each of the eight files. The results are as shown in Table VII.

TABLE VII. FILE READ/WRITE

File Name	File Size (MB)	CakePHP Time (millisec)	Laravel Time (millisec)	CodeIgniter Time (millisec)
1.txt	2.506204	65.94	52.89	63.93
2.txt	5.087024	110.7	103.04	115.18
3.txt	10.173506	209.5	224.13	207.34
4.txt	20.347014	582.5	434.83	415.54
5.txt	40.69403	1114.37	845.98	865.99
6.txt	81.388062	1696.98	1706.8	1653.79
7.txt	162.77613	3402.53	3338.44	3292.38
8.txt	325.55225	7034.43	6680.45	6850.06
Average		1777.1188	1673.32	1683.02625

On average, Laravel application performed the best for reading and writing text files. CakePHP application performed the worst. So, the file processing component of Laravel framework has the best performance.

V. SUMMARY AND FUTURE WORK

In terms of performance, CodeIgniter performed the best for **Complex Data**, **CRUD Operations** and **Upload Images** tasks. Laravel performed the best for **Read/Write Files** and performed the worst for **Complex Data**. This could be due to that CodeIgniter is the simplest PHP framework with the smallest files numbers among the three selected frameworks in this study; therefore, the framework data transferring overhead is small, thus more efficient. In general, CodeIgniter has the best performance and Cake PHP has the worst performance. In terms of reusability, CakePHP has the highest score. This suggested that the performance and the reusability are not in proportional

relationship. There could be a number of reasons for this. The regular expressions cannot deal with repeat variable occurrences; this may result in inaccuracy of the reusability score. Further research is required to produce more accurate regular expressions.

In the future, more frameworks should be included to get the general guidelines for PHP framework evaluation. The following factors should be considered in the PHP framework measurements.

- Investigate the benchmark tools for measurements
- Learning curve.
- Neat & clean intuitive API.
- Scalability.
- Security.
- Solid code written on proven design patterns.
- Quality of documentation.
- Security vulnerability

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Responsive Web Design Mode and Application

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Abstract—Responsive web design have receive a popular attention in recent years because of they can meet a variety of internet terminals resolution. This paper will discuss how to use Media Queries, Bootstrap responsive navigation, and layout of streaming technology to achieve responsive web design. And make a rational analysis about responsive web development at the present stage.

Keywords- *Responsive, Flow layout, Media Queries, Bootstrap*

I. INTRODUCTION

With the rapid development of mobile Internet, Internet terminals are increasingly designed in many ways, the screen size of the device meets the different needs of users, but the size of the site is impossible to design a dedicated interface for each device. Therefore, responsive web design get progressively generate and more widely used. Responsive Web Design (Responsive Web Design, RWD), integrate three kinds of existing development skills (flexible network pattern, flexible pictures, media and media inquiries) and named responsive Web design. Its essence is to design a web content display mechanism in perfect layout for any device. Responsive design is not only changing the page-layout based on the size of the viewport, but also to subvert the whole methods from the current design. Formerly, web designers fixed width design for the desktop computer, then zoomed out and rearranged content for the small screen . Design and Development of the web page should make an appropriate response and adjustment according to user's system platform, screen size, screen orientation and so on. That means no matter what screen size of the device is being used, we should be able to switch the page resolution, picture size and related scripting capabilities automatically, so as to adapt to different devices.

II. CURRENT SITUATION ANALYSIS

Most Web pages used a design method called “waterfall model”. It starts with analyzing the system requirements, and then set out to design the front-end and background, finally evaluate and implement. Linear nature is the main feature of “waterfall model”. The whole process of the design is developed by a series of sequential stages which promote the work just along a single direction.

And in the website building process, "responsive design" use a same set of codes to make web content properly displayed on the PC, tablet and smart-phone browsers. Now, more and more web developers want to meet all of the operating environments by building a flexible website.

Through different development process, we can know that, besides designing in accordance with the standard desktop browser, “waterfall model” almost did not consider any other design and development environment, which have become its biggest drawback. While "responsive design" have taken these cross-platform issues into account from the beginning, so that it can complete pre-patterned framework, design and testing in more detail. But these works have been omitted in “waterfall model” precisely. Once the website design based on response design completed, it will be presented on the PC, mobile devices and tablet computers in appropriate way.

Of course, as one of the most popular front-end website development technologies in recent years, “responsive design” have became more in-depth with continually exploration, while some practical problems appeared during so many designers have applied this technology on their website.

A. Main advantages

- User-friendly: more and more mobile devices enhance the user experience. Obviously, responsive Web design have provided users a friendly Web interface, because it can be adapted to almost all devices' screen.
- Less Maintenance: Develop a responsive website, maintenance costs will be minimal, because it has only one layout which can work on all types of equipment and significantly reduce the workload. To explore a separate mobile site, actually two separate sites, designers need to maintain the two sites at the same time, and what's more tedious is that the data are not synchronize between two sites.
- No additional domain names: If you use responsive websites, it's will be only one site. But if you are using a mobile website, there are two sites, you need to configure an additional separate domain.

B. Problems

- So many code pages cause files increased which affect loading speed obviously. In order to fit different devices, responsive design requires a lot of specialized CSS and JavaScript codes, which affects the page loading speed.
- Generally in response design, pictures, videos and other resources are uniform loading. It resulted that when loading on a low resolution device with pictures or videos which display requirements are higher than the device's specifications, unnecessary flow will waste and load speed will be impacted.
- In recent years, responsive design's application rate are low to large portal or e-commerce websites. Because the basic principle of "responsive design" is giving users same content even on different devices (such as deleting some content on low resolution devices). And there are so many single web pages on large portal or e-commerce websites. When reducing on low-resolution devices as well as ensuring the content can be browsed by whole, the page will be stretched inevitably, increasing the difficulty of browsing.

III. IMPLEMENTATION

This paper discusses the use of the Media Queries, Bootstrap responsive navigation, and Flow layout (defined web content width by percentage) and other technologies to achieve responsive web design.

First, we should introduce a line of code to the head tag:

```
<meta name="viewport" content="width=device-width,
initial-scale=1, maximum-scale=1, user-scalable=no">
```

This is a description of the viewport, most mobile browsers will enlarge the width of the HTML page's view (viewport) to comply with the screen resolution. Use meta tag to reset the view. Here the setting means that using device's width as view width and prohibiting the initial scaling width. Default scaling is 1.

A. Media Queries

Media Queries module of CSS3 is the core elements of responsive design, we can set the CSS styles for the device according to the characteristics of the display. Use a few lines of codes, we can change the contents of the page displayed according to the width of the viewport, screen ratio, device orientation (landscape or portrait) or other features.

There are many kinds of media properties. But responsive design mainly use characteristics which can judge screen size like max-width or min-width and judge the orientation of device like feature of orientation. Setting CSS styles through the different screen sizes range, you can define the display of all devices in a CSS style sheet. How meticulous the range have been delineated will decide the compatible breadth of responsive design devices.

If a terminal's resolution is less than 980px, the code is:

```
@media screen and (max-width: 980px) {};
```

If set a views which are compatible with iPad and iPhone, the code is:

```
/**iPad**/
@media only screen and (min-width:768px) and (max-
width:1024px){}
/*iPhone*/
@media only screen and (min-width:320px) and (max-
width:767px){}
```

B. Bootstrap responsive navigation

Bootstrap, launched by Twitter, is an open source package for front-end development. It is also a CSS / HTML framework. Bootstrap offers an elegant specification of HTML and CSS, which is written by Less, a kind of dynamic CSS language. It will unite the nature of elements which have been already defined and provide for users to calling, that's what make the front-end Web development greatly facilitated. The response navigation which developed on the basis of the bootstrap, is a small JavaScript plugin and only 1.7KB after compression, we can create switchable navigation for the small screen. It supports touch screen and CSS3 transition effects, with very good performance. And it also supports transition from height: 0 to height: auto, which is rarely achieved in CSS3 transition effects.

First, setting in CSS:

```
html, body{min-width:1333px}
```

It will set the minimum width of the page as same as the users' device own resolution, so the page will not deform. Min-width is the property of CSS2, so compatibility is good. Then, CSS responsive documents haven't joined the default of Bootstrap, so it should be introduced into the header file on the basis of <meta> have been to:

```
<link href="assets/css/bootstrap-responsive.css" rel="stylesheet">
```

So that, in this way, we can use bootstrap to achieve responsive navigation.

C. Flow layout(defined web content width by percentage)

When a user narrow the browser window, often find that a part of the contents in the original page can not be displayed in the browser. To view this part, users need to operate the horizontal or vertical scroll bar that appears in browser. This not only causes inconvenience to browse the web, but also have difficulties in printing on different sizes of paper. There are two key points of flow layout: first, all involved DIV modules in the layout are set to float: left; Second, widths are expressed by percentage. For example, we defined a CSS rule: div#content {width:70%;}. That means div # content width is 70% of the width of its parent element. Thus, when the browser window is resized, div # content width will change.

Making examples according to above method are as follows:



Figure 1. PC 1280*1024



Figure 2. iPad 2048*1536

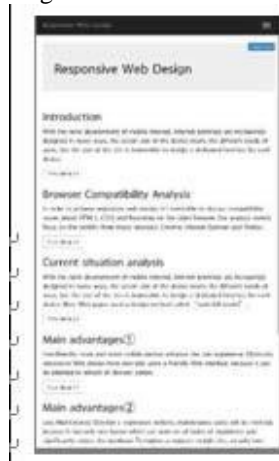


Figure 3. iPhone 640*1136

IV. BROWSER COMPATIBILITY ANALYSIS

In order to achieve responsive web design, it's inevitable to discuss compatibility issues about HTML5, CSS3 and Bootstrap on the client browser. Our analysis mainly focus on the world's three major browsers: Chrome, Internet Explorer and Firefox.

Overall, Bootstrap almost supports all latest versions of browsers. In the Windows platform, it supports Internet Explorer 8-11. Bootstrap's compatibility also performed well in Chrome(Linux version), Firefox(Linux version) and Internet Explorer 7, although not its official support. More detail information are in the following table:

TABLE I. TABLE TYPE STYLES

	Chrome	Firefox	Internet Explore	Opera	Safari
Android	✓	✓	N/A	×	N/A
iOS	✓	N/A	N/A	×	✓
Mac OS X	✓	✓	N/A	✓	✓
Windows	✓	✓	✓	✓	×

✓--Compatible ×--Incompatible N/A--Not Applicable

However, some CSS3 and HTML5 properties can not show good compatibility on Internet Explorer 8 and 9. For example:

TABLE II. CSS PROPERTY COMPATIBILITY

CSS Property	Internet Explore 8	Internet Explore 9
<i>border-radius</i>	×	✓
<i>box-shadow</i>	×	✓
<i>transform</i>	×	✓
<i>transition</i>	×	×
<i>placeholder</i>	×	×

✓--Compatible ×--Incompatible N/A--Not Applicable

In addition, in order to support Media Queries, Internet Explorer 8 need coordinate with Respond.js.

Bsise, a kind of IE6 compatibility library belongs to Bootstrap, make up the pity that caused by IE6 incompatibility issue. Currently, Bise support most properties of bootstrap on IE6, but there also have some properties that couldn't support. Bise Usage: First, introduced CSS file to <head> tag, and then introduced Bise CSS patch file:

```
<link rel="stylesheet" type="text/css"
href="bootstrap/css/bootstrap-ie6.css">
<link rel="stylesheet" type="text/css" href="bootstrap/css/ie.css0">
```

Finally add JavaScript file and Bise JavaScript patch file to the end of HTML document.

Overall, responsive web which used Bootstrap to achieve usually have better compatibility for browser.

V. CONCLUSION

The web, based on responsive design, can adapt to the environment of browsing device automatically and independent of the device itself. It largely avoid iterative development which caused by the differences between browsing equipment. Not only improve the efficiency, save a lot of manpower and material resources, but also ensure the

consistency of view pages between desktop output devices and mobile terminals.

Of course, we cannot agree that responsive web is the best solution to all the problems of design and content services. As same as web design in the past, a project's specific circumstances (such as budget, target users, and site uses) determine its way of implementation. According to the experiences we already have, if your budget is limited or not feasible to develop a mobile website, comparing with standard fixed-width design, responsive design always provide a better and non-discriminatory users' experience . Following the principle of giving priority to moving, the first interface is usually designed for mobile devices and then make PC as an extension. So, mobile terminals don't load extra resources, don't redraw the pages of different style in PC terminals, which may affect the performance of the PC.

You can use the method described in this paper, transforming the web site that has already existed, satisfying users' different devices by achieving responsive web design.

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