MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education
"South Ural State University (National Research University)"
School of Electrical Engineering and Computer Science
Department of Computer Science

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"___"_____ 2020

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"___"_____ 2020

DEVELOPMENT OF WEB-APPLICATION
FOR CHOOSING CAR SERVICES

GRADUATE QUALIFICATION WORK
SUSU–02.04.02.2020.308–578.GQW

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"___"_____ 2020

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"___"_____ 2020

TASK
of the master graduate qualification work
for the student of the group CE-219
Alaq Jalal Dheyaa Mohammed
in master direction 02.04.02
"Fundamental Informatics and Information Technologies"
(master program "Database Technologies")

1. The topic (approved by the order of the rector from 24.04.2020 No. 627)
Development of web-application for choosing car services.
2. The deadline for the completion of the work: 03.06.2020.
3. The source data for the work
3.1. GeeksforGeeks. [Electronic Resource] URL: http://www. geeksfor-geeks.org/PHP-introduction/ (the date of access: 05.04.2020).
3.2. W3schools. [Electronic Resource] URL: http://www. w3schools.com/PHP/PHP_intro.asp / (the date of access: 07.04.2020).
3.3. Guru99. [Electronic Resource] URL: http://www. guru99.com/introduction-to-javascript.html / (the date of access: 05.04.2020).
4. The list of the development issues
4.1. To study the problem statement and choose development tools for the web application.
4.2. To develop the structure of the required database for the web application.
4.3. To design the web application.
4.4. To implement the web application.
4.5. To test the web application.
5. Issuance date of the task: 09.02.2020.

Supervisor
Cand. Sci., Assoc. Prof.   O.N. Ivanova
The task is taken to perform   J.D.M. Alaq

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INTRODUCTION

Topicality

The Internet is increasingly playing a vital role in all our lives, so it's all the more important to understand how it works and how you can get the best from it. In a very summarized nutshell, the Internet began life in the 1960s as a way for the US Defense Department to share information between computers.

Fast forward 30 years and in 1989 Tim Berners-Lee proposed the World Wide Web, allowing "interlinked hypertext documents" (such as web pages) to be viewable, and consequently making well presented online information available to the public[16].

With some modern technological additions to the cars and the presence of some expensive cars and the presence of some places that are not equipped and unable to do maintenance as required, the maintenance process requires a little bit of narration and the search for the right place and reliable.

Maintenance must be done in the centers of maintenance of cars by specialists who experience the honesty and confidence. This is what we seek in the site of my car, where we will provide adequate information about specialized car maintenance centers for all types of cars and provide their means of communication from telephones, e-mails and other information in a way that makes you comfortable before going to the place.

Importance of choosing the appropriate and reliable car maintenance centers I the following.

The selection of good car maintenance centers is of great importance to you and to other car owners, as specialists accomplish the maintenance.

Good repair of the holidays from the first time and properly to ensure the good performance of the car.

Fixing holidays appropriately from the first time is to save time, effort and money.

Good repair and maintenance means that the holidays do not come back again.

Repair of the parts and parts required to be repaired or replaced prevents negative side effects on the rest of the vehicle.

Reliable Maintenance Centers Reliable spare parts means the complete care of the car and maintain its performance and value.

Good maintenance in a row means maintaining the car and its worth.

Speed of performance and punctual schedules without compromising quality and proficiency.

We will, through WorkshopIQ, display an online purchase page to help customers purchase spare parts for the car while they are in their homes to get the spare parts that they requested to the addresses that they placed without the need to come to the maintenance center, and that is for the sake of ease and flexibility only for them to fill in the required information on the registration page.
Having a web site gives people around the world opportunity to know your business or provided services. It can spread your business so fast, therefore you can achieve success.

Research goal and objectives

The goal of the project is to develop a web site for car maintenance by choosing car services. In order to attain this goal, we must solve the following objectives:

1) to study the problem statement and make the Comparative between PHP core and PHP framework for website development;

2) to develop the structure of the required database for the information website;

3) to design the web-application;

4) to implement the website;

5) to test the system.

The practical significance

This system specializes in information for maintenance and auto services and sale of spare parts for cars, as this site provides multiple services regarding providing all types of maintenance for cars.

This project useful, because it contains important features to assist easy transaction online:

1) secure access for the private data about the users;
2) allow every user to request a service;
3) allow every register user to buy items;
4) saving the time and efforts while working at site;
5) every register seller can edit his added items to the system
6) unlimited number of users;
7) ability for the following development of the site.

Structure of the thesis

The thesis consists of four chapters, introduction, conclusion and reference list.

In the first chapter, the problem statement is given as well as the overview and comparative analysis of popular content management systems for web-development is done. Additionally, we describe the chosen development tools here.

In chapter two, there is a description of functional requirements, use case diagram, database scheme and the design of the application interfaces.

In chapter three, we show the architecture of the developed system, several of PHP-code for implementing the basic functionality of the system.

Chapter Four is devoted to the testing of the application.

The thesis has 60 pages; the list of references contains 20 resources.

1. THE ANALYSIS OF THE SUBJECT AREA

1.1. The problem statement

The Project of Online Reservation for Car Service is needed for the country as technology grows fast in the world. The purpose to develop this project is to provide better solution to the problems that the customers faces. This website will provide customers to reserve their car services from their home or from office. For moment, there is non- availability such reservation system in Iraq. Customer feels hard to send their car for service, either they need to reserve using telephony system or walk in to send their car for service.

The scope of this online reservation for car services system covers various functions.

Firstly, it covers the services information. This is when the users can view the services provided by the specified service centre.

Secondly, it covers on identifying the location. Users can view on the location and images of the car services centre. This creates a better trust and understanding of the recognized service centre.

Thirdly, the system covers the operating hours of the service centres. This helps the users to familiarize themselves on the operating hours of the particular centre.

Fourthly, the system provides a log-in authority. This system provides access to members. This is where user who wants to send their car for services would have to register their details and car details online. Non-members can only view the basic interface of the online system.

Fifthly, the system provides an online market so the user can buy many products from different companies so the user can purchase many products or spare parts for cars by just one click while he is sitting at his home

Sixthly, the system covers on online feedbacks. The registered user may send their feedback to the admin staff online.

The main objective of this system is to provide customers with a much convenient and better way of booking their car services and purchase spare parts . It

is an online system for car services reservation and purchase spare parts for car and users will have to sign up through the registration page so they'll be able to view the various car services and many products provided by the car services centre. This way of reservation is unique in Iraq as it has been already implemented in other countries. This system is created to manage the reservation processes through online where the previous older ways were done manually.

This system would be a productive solution for users and the car services centre. It will also reduce the work process of the admin while the data will be kept securely. The proposed system in the project will produce various plus points as being a web-based system. First is the security. This consist user/Admin login accounts, automated user ID for Admin and registered user, and a secured database. Second is a paperless work. This consists of an online record keeping which is web-based and registration can be made online at anytime and anywhere. Third is the reduction of human error. Finally, the proposed system will save time for the customers who have to wait the queue for those who walk – in and telephone reservation.

1.2. How different is Core PHP from PHP Frameworks?

Core PHP is a very basic PHP programming language; it is used to create dynamic web pages.

Core PHP works without any extra library, which a PHP framework cannot, so it is very important to learn core of principle PHP programming to create dynamic web applications.

Core PHP uses the purest form of PHP script, a developer needs to know the language thoroughly in order to write a clear and concise code using core PHP.

It required a good amount of skill to write flawless code using its Core form. And it actually saves time if you are really good at it.

Core PHP has a rich set of functionalities available so that the developer does not have to embed the same code again and again.

When it comes to PHP framework, they usually have a fixed set of rules and hence the code can be passed from one developer to another without any hassles. But with Core PHP, a PHP developer cannot read other developer's code that easily.

PHP framework on the other hand provides consistency in the code and are big time savers when the project needs to be handled by several developers at the same time. Also Framework rarely allows you to write bad code which ensures less time in debugging later and helps you to finish a project faster. Integrating your entire module becomes very easy as you do not have to separately understand each developer's code.

Frameworks actually ensures you to separate the logic from the views by using the MVC models. This is a great practice and helps keep the code clean and makes it easy for modifications.

Core PHP is similar to solving problems step by step and PHP framework is similar to that of scientific calculator.

It's a simple phenomenon that a person who is smart can complete a given task with less calculations and has the ability to use shortcuts. Which means an average programmer or developer will struggle with using the Core PHP and A PHP framework is something for all the average coders out there. May be because of this results of Core PHP are mostly inconsistent as there is no assistance provided, and the results are much better on the PHP framework.

It may be faster and more accurate to build a web application in the PHP framework, but if you can learn and understand Core PHP, you can work on all the frameworks that are out there.

You create an amazing foundation for coding and it greatly improves your understanding of web development as a whole, you wouldn't be limited to a particular framework. It is a common notation that if you are a beginner, a framework is a good place to start with.

Start with Core PHP and everything else is a child's play, which is because, even frameworks require the basic knowledge of core PHP functions, classes and

methods. However, websites and web applications built using a framework can provide you with a very systematic method of coding which is easy to maintain even when the PHP developer who has actually built it is not around.

On top of that, if you decide to create a web application or a website for your business and are looking at hiring a PHP web development company to do the task for you, make sure that you consider the type of development you want for your website.

You need to be specific if you want a Core PHP or any of the PHP frameworks for custom PHP development, make sure that you understand all the pros and cons that come with them.

Compared to Core PHP or any other PHP programming languages, a framework is really slow in execution and always creates some or the other complexion and overhead in the form of classes and libraries loaded before your code even gets called.

1.3. Development technologies
1.3.1. HTML

HTML stands for Hyper Text Markup Language. It is used to design web pages using markup language. HTML is the combination of Hypertext and Markup language. Hypertext defines the link between the web pages. Markup language is used to define the text document within tag which defines the structure of web pages.

This language is used to annotate (make notes for the computer) text so that a machine can understand it and manipulate text accordingly. Most of markup (e.g. HTML) languages are human readable. Language uses tags to define what manipulation has to be done on the text. HTML is a markup language which is used by the browser to manipulate text, images and other content to display it in required format.

HTML was created by Tim Berners-Lee in 1991. The first ever version of HTML was HTML 1.0 but the first standard version was HTML 2.0 which was published in 1999 [2].

HTML is the most common used language to write web pages. It has recently gained popularity due to its advantages such as:

1) it is the language which can be easily understood and can be modified;

2) effective presentations can be made with the HTML with the help of its all formatting tags;

3) it provides the more flexible way to deign web pages along with the text;

4) links can also be added to the web pages so it helps the readers to browse the information of their interest;

5) you can display HTML documents on any platforms such as Macintosh, Windows and Linux etc.;

6) graphics, videos and sounds can also be added to the web pages which give an extra attractive look to your web pages [8].

1.3.2. CSS (Cascading Style Sheets)

Cascading **S**tyle **S**heets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable. CSS handles the look and feel part of a web page.

Using CSS, you can control the color of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images or colors are used, layout designs, variations in display for different devices and screen sizes as well as a variety of other effects.

CSS is easy to learn and understand but it provides powerful control over the presentation of an HTML document.

Most commonly, CSS is combined with the markup languages HTML or XHTML [17].

Below are the advantages:

1) device compatibility;

2) faster website speed;

3) easily maintainable;

4) consistent and spontaneous changes;

5) ability to re-position;

6) enhances search engine capabilities to crawl the web pages [1].

1.3.3. PHP

The term PHP is an acronym for PHP: Hypertext Preprocessor. PHP is a server-side scripting language designed specifically for web development.

Websites like www.facebook.com, www.yahoo.com are also built on PHP.

One of the main reason behind this is that PHP can be easily embedded in HTML files and HTML codes can also be written in a PHP file.

The thing that differentiates PHP with client-side language like HTML is, PHP codes are executed on server whereas HTML codes are directly rendered on the browser. PHP codes are first executed on the server and then the result is returned to the browser.

The only information that the client or browser knows is the result returned after executing the PHP script on the server and not the actual PHP codes present in the PHP file. Also, PHP files can support other client-side scripting languages like CSS and JavaScript.

PHP can actually do anything related to server-side scripting or more popularly known as the backend of a website. For example, PHP can receive data from forms, generate dynamic page content, can work with databases, create sessions, send and receive cookies, send emails etc. There are also many hash functions available in PHP to encrypt user's data that makes PHP secure and reliable to be used as a server-side scripting language. So these are some of the abilities of PHP that makes it suitable to be used as server-side scripting language. Even if you are not convinced by the above abilities of PHP, there are some more features of PHP. PHP can run on all major operating systems like Windows, Linux, Unix, Mac OS X etc. Almost all of the major servers available today like Apache

supports PHP. PHP allows using wide range of databases. And the most important factor is that it is free to use and download and anyone can download PHP from its official source: www.PHP.net [3].

What Can PHP Do? [20]

- PHP can generate dynamic page content;
- PHP can create, open, read, write, delete, and close files on the server;
- PHP can collect form data;
- PHP can send and receive cookies;
- PHP can add, delete, modify data in your database;
- PHP can be used to control user-access;
- PHP can encrypt data.

With PHP you are not limited to output HTML. You can output images, PDF files, and even Flash movies. You can also output any text, such as XHTML and XML.

What's new in PHP 7 [20].

- PHP 7 is much faster than the previous popular stable release (PHP 5.6);
- PHP 7 has improved Error Handling;
- PHP 7 supports stricter Type Declarations for function arguments.
- PHP 7 supports new operators (like the spaceship operator: <=>).

1.3.4. Java Script

JavaScript is a very powerful client-side scripting language. JavaScript is used mainly for enhancing the interaction of a user with the webpage. In other words, you can make your webpage more lively and interactive, with the help of JavaScript. JavaScript is also being used widely in game development and Mobile application development. JavaScript was developed by Brendan Eich in 1995, which appeared in Netscape, a popular browser of that time. The language was initially called LiveScript and was later renamed JavaScript.

There are many programmers who think that JavaScript and Java are the same. In fact, JavaScript and Java are very much unrelated. Java is a very complex programming

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language whereas JavaScript is only a scripting language. The syntax of JavaScript is mostly influenced by the programming language C. Being a scripting language, JavaScript cannot run on its own. In fact, the browser is responsible for running JavaScript code. When a user requests an HTML page with JavaScript in it, the script is sent to the browser and it is up to the browser to execute it [4].

The main advantage of JavaScript:

- JavaScript is a object-based scripting language;
- It gives the user more control over the browser;
- it handles dates and time;
- it detectsg the user's browser and OS;
- it is light weighted;
- JavaScript is a scripting language and it is not java;
- JavaScript is interpreter based scripting language;
- JavaScript is case sensitive [12].

1.3.5. MySQL

MySQL is a Relational DataBase Management System (RDBMS).

RDBMS means R--DB--MS.

DB stands for Database, a repository for the information store.

The data in a database is organized into tables, and each table is organized into rows and columns.

Each row in a table is called a record. A record may contains several pieces (called fields) of information, and each column in a table is known as a field.

MS stands for Management System, the software that allows you to insert, retrieve, modify, or delete records.

R stands for Relational, indicates a particular kind of DBMS that is good at relating information stored in one table to information stored in another table by looking for elements common to each of them. Relational DBMS has the advantage of efficient storage, and retrieval mechanisms for data, and uses normalization process during design of RDBMS. Database normalization process is beyond the scope of this article, and several references are available.

MySQL operates using client/server architecture in which the server runs on the machine containing the databases and clients connect to the server over a network. The server operating systems is usually a Linux (like Redhat 9.0 etc.) or Windows 2000 operating system. Typically mySQL is supported on Windows XP, Windows Server 2003, Red Hat Fedora Linux, and Debian Linux, and others. As with any other client/server application, MySQL is a multi-user database system, meaning several users can access the database simultaneously. Here, the server (MySQL server) listens for client requests coming in over the network and accesses database contents according to those requests and provides that to the clients.

Clients are programs that connect to the database server and issue queries in a pre-specified format. MySQL is compatible with the standards based SQL (SQL stands for Structured Query Language) language. The client program may contact the server programmatically (meaning a program call the server during execution) or manually. For example, when you are issuing commands over a telnet session to a MySQL server, you are issuing the requests to the server by typing commands at your command prompt manually. On the other hand, if you have input some data (say your credit card information on the Internet towards purchase of some goods) in a form, and the form is processed by using a server side program, then the MySQL server is contacted programmatically. This is often the case in credit card approvals, member subscriptions etc. [18].

The following are the most important features of MySQL:

1) easy to use;
2) it is secure;
3) free to download;
4) it is scalable;
5) speed;
6) high flexibility;
7) memory efficiency;
8) high performance [7].

1.3.6. PhpMyAdmin

PHPMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the Web. PHPMyAdmin supports a wide range of operations on MySQL and MariaDB. Frequently used operations (managing databases, tables, columns, relations, indexes, users, permissions, etc) can be performed via the user interface, while you still have the ability to directly execute any SQL statement. PHPMyAdmin comes with a wide range of documentation and users are welcome to update wiki pages to share ideas and howtos for various operations.

PHPMyAdmin is also very deeply documented in a book written by one of the developers – Mastering PHPMyAdmin for Effective MySQL Management, which is available in English and Spanish.

To ease usage to a wide range of people, PHPMyAdmin is being translated into 72 languages and supports both LTR and RTL languages. The PHPMyAdmin project is a member of Software Freedom Conservancy. SFC is a not-for-profit organization that helps promote, improve, develop, and defend Free, Libre, and Open Source Software (FLOSS) projects.

Features:

1) Intuitive web interface;

2) Support for most MySQL features:

- browse and drop databases, tables, views, fields and indexes;

- create, copy, drop, rename and alter databases, tables, fields and indexes;

- maintenance server, databases and tables, with proposals on server configuration;

- execute, edit and bookmark any SQL-statement, even batch-queries;

- manage MySQL user accounts and privileges;

- manage stored procedures and triggers;

3) Import data from CSV and SQL;

4) Export data to various formats: CSV, SQL, XML, PDF, ISO/IEC 26300 - OpenDocument Text and Spreadsheet, Word, LATEX and others;

5) Administering multiple servers;

6) Creating graphics of your database layout in various formats;

7) Creating complex queries using Query-by-example (QBE);

8) Searching globally in a database or a subset of it;

9) Transforming stored data into any format using a set of predefined functions, like displaying BLOB-data as image or download-link and much more [11].

2. DEVELOPMENT OF A SITE

2.1. Functional requirements

A Functional Requirement (FR) is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform [5].

Functional requirements are something any project must have in order not to get fail during the work.

The features that are available for the admin.

1. The admin must be able to manage item.
2. The admin must be able to update profile.
3. The admin must be able to manage users.
4. The admin must be able to manage shop.
5. The admin must be able to view shop orders.
6. The admin must be able to view a detailed list of all his orders.
7. The admin must be able to update last service date for member.
8. The admin must be able to check requests.
9. The admin must be able to make order.

The features that are available for the User (Customer).

1. The customer must be able to update profile.
2. The customer must be able to view a detailed list of all his orders.
3. The customer must be able to make order.
4. The customer must be able to request a service.

The features that are available for the User (Seller).

1. The Seller must be able to update profile.
2. The seller must be able to manage item.
3. The seller must be able to manage shop.
4. The seller must be able to view shop orders.

5. The seller must be able to request a service.

6. The seller must be able to view a detailed list of all his orders.

7. The seller must be able to make order.

The features that are available for the User (Guest).

1. The guest must be able to request a service.

2. The guest must be able to preview items in shop.

3. The guest must be able to signup.

2.2. Use case diagram

A use case diagram is a dynamic or behavior diagram in UML. Use case diagrams model the functionality of a system using actors and use cases. Use cases are a set of actions, services, and functions that the system needs to perform. In this context, a "system" is something being developed or operated, such as a web site. The "actors" are people or entities operating under defined roles within the system. Use case diagrams are valuable for visualizing the functional requirements of a system that will translate into design choices and development priorities.

They also help identify any internal or external factors that may influence the system and should be taken into consideration.

They provide a good high level analysis from outside the system. Use case diagrams specify how the system interacts with actors without worrying about the details of how that functionality is implemented [13].

Fig. 1 shows the Use case diagram for the information website functions. Use case "Manage users" is available for the Admin only.

Use case "Update last service date for member" is available for the Admin only.

Use case "Check requests" is available for the Admin only.

Use case "Make order" is available for the admin, seller and customer.

Use case "view a detailed list of all his orders" is available for the admin, seller and customer.

Use case "Preview items in shop" is available for the admin, seller, customer and guest.

Use case "Contact with the site" is available for the seller, customer and guest.

Use case "Signup" is available for the Guest only.

Use case "Update profile" is available for the admin, seller and customer.

Use case "Request a service" is available for the seller, customer and guest.

Use case "Manage item" is available for the Admin and seller.

Use case "Manage shop" is available for the Admin and seller.
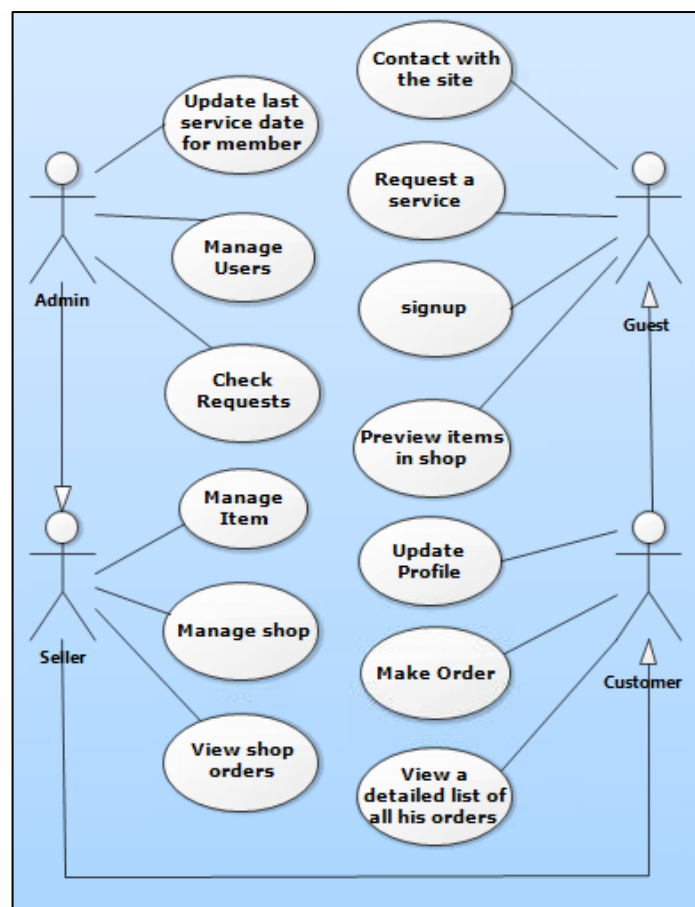
Fig. 1. Use case diagram

2.3. Development of the database

A database management system (DBMS) is a software package designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data itself, the data format, field names, record structure and file structure. It also defines rules to validate and manipulate this data.

A DBMS relieves users of framing programs for data maintenance. Fourth-generation query languages, such as SQL, are used along with the DBMS package to interact with a database.

A database management system receives instruction from a database administrator (DBA) and accordingly instructs the system to make the necessary changes. These commands can be to load, retrieve or modify existing data from the system.

A DBMS always provides data independence. Any change in storage mechanism and formats are performed without modifying the entire application [15].

We decided to specify the following tables of the database:

1) the "User" table;

2) the "Services_log" table;

3) the "Categories" table;

4) the "Roles" table;

5) the "Parts" table;

6) the "Receipt" table;

7) the "Orderlist" table;

8) the "Service" table;

9) the "Locations" table;

10) the "Projects" table.

These are the relations between the tables as shown below:

- one category has many parts.

- one service has one location.

- one user has many orderlist.

- one orderlist has many receipts.

- one service has many projects.

- one service has many parts.

- one receipt has one part.

The scheme of the database consists of 10 tables as in the fig. 2.
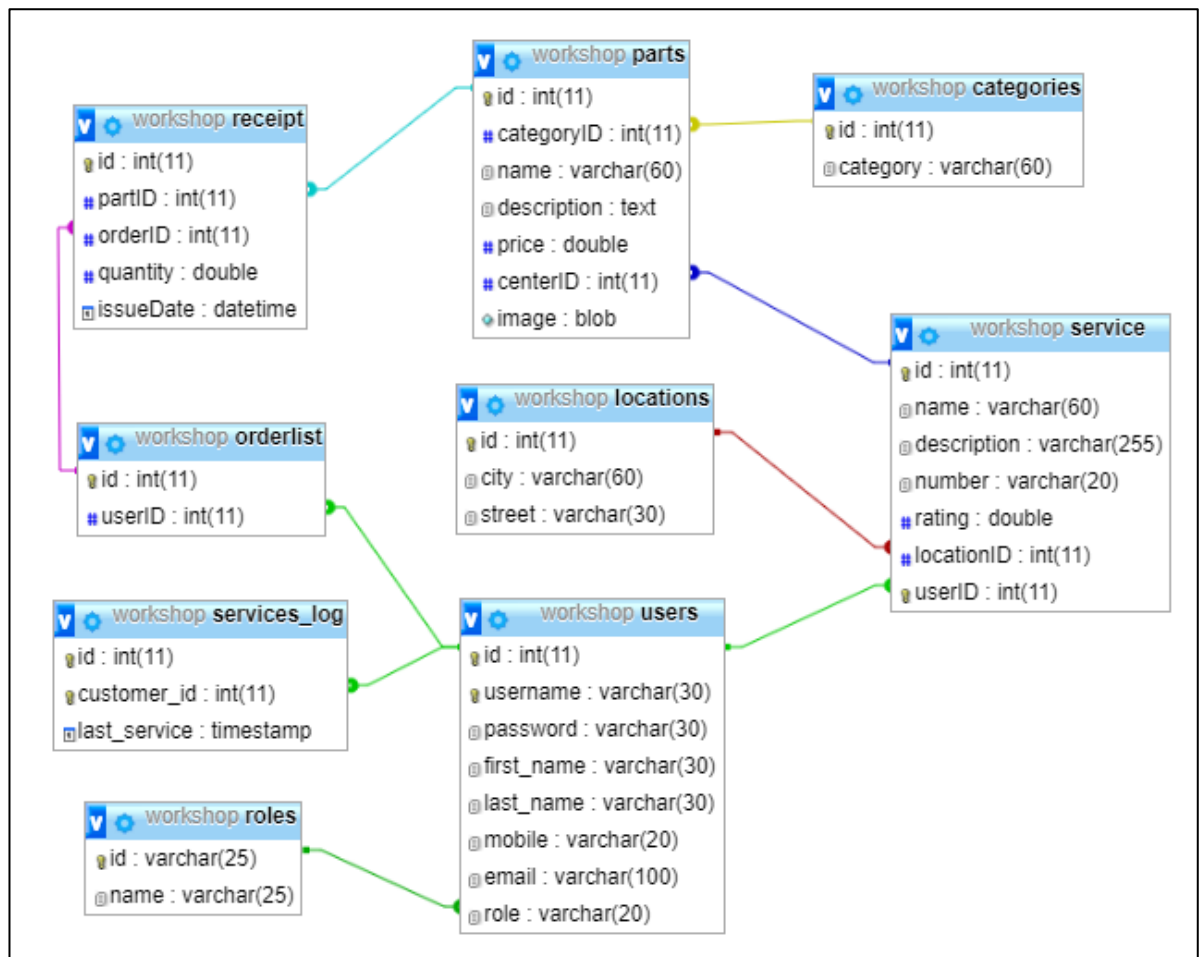
Fig. 2. The scheme of the database

The table "User" consists of 8 fields and contains the information of the users that register in the website as in the fig. 3. It consists of the following fields:

1) ID: the primary key for user table and the datatype (int);
2) Username: the name of user and the datatype (varchar);
3) Password: the password of user and the datatype (varchar);
4) First_Name: the first name of user and the datatype (varchar);
5) Last_Name: the last name of user and the datatype (varchar);
6) Mobile: the mobile's number of user and the datatype (varchar);
7) Role: the role of user and the datatype (varchar);
8) Email: the email of user and the datatype (varchar).

id	username	password	first_name	last_name	mobile	email	role
1	customer	12345	Jalal	Customer	0501122334	Jalal.Customer@email.com	customer
2	user2	12345	Ahmad	Sameeh	050555522	Ahmad.Sameeh@email.com	customer
4	admin	12345	Jalal	Admin	0501122334	Jalal.Admin@email.com	admin
5	seller	12345	Jalal	seller	0501122334	Jalal.seller@email.com	seller
11	ahmad	123	Ahmad	Mohammad	54564545	Ahmad.Mohammad@email.com	customer
15	asdsad	asds	asdsa	asdas	3323	dasdas@sss.com	customer

Fig. 3. Structure of the table "User"

The table "Services_log" consists of 3 fields and contains the information of the last service date as in the fig. 4. It consists of the following fields:

1) id: the primary key for Services_log table and the datatype (int);

2) customer_id: the datatype (int);

3) last_service: the datatype (timestamp).

id	customer_id	last_service
4	2	2020-05-01 03:44:15
5	10	2020-05-01 03:53:01
10	1	2020-05-14 13:31:26
11	11	2020-05-01 07:49:25

Fig. 4. Structure of the table "Services_log"

The table "Categories" consists of 2 fields and contains the information of the Categories in the website as in the fig. 5. It consists of the following fields:

1) id: the primary key for Categories table and the datatype (int);

2) category: the datatype (varchar).

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Fig. 5. Structure of the table "Categories"

The table "Locations" consists of 3 fields and contains the information of the locations in the website as in the fig. 6. It consists of the following fields:

1) id: the primary key for Locations table and the datatype (int);
2) city: the datatype (varchar);
3) street: the datatype (varchar).

Fig. 6. Structure of the table "Locations"

The table "Parts" consists of 7 fields and contains the information of the parts in the website as in the fig. 7. It consists of the following fields:

1) id: the primary key for Parts table and the datatype (int);
2) categoryID: the datatype (int);
3) name: the datatype (varchar);
4) description: the datatype (text);
5) price: the datatype (double);
6) centerID: the datatype (int);
7) image: the datatype (blob).

id	categoryID	name	description	price	centerID	image
59	2	Tools Set	The IQ series has all the tools and equipment you ...	15	1	[BLOB - 35.6 KiB]
60	2	tools	tools	223	1	[BLOB - 44.5 KiB]
61	3	Wheel	Universal Alloy Wheel Protector Fits	60	1	[BLOB - 11.9 KiB]
62	3	Wheel	Universal Alloy Wheel Protector Fits	60	1	[BLOB - 11.9 KiB]
63	2	tool set	The IQ series has all the tools and equipment you ...	33	1	[BLOB - 44.5 KiB]
64	3	Wheel	Universal Alloy Wheel Protector Fits	60	1	[BLOB - 11.9 KiB]

Fig. 7. Structure of the table "Parts"

The table "Receipt" consists of 5 fields and contains the information of the receipts in the website as in the fig. 8. It consists of the following fields:

1) id: the primary key for Receipt table and the datatype (int);

2) partID: the datatype (int);

3) orderID: the datatype (int);

4) quantity: the datatype (double);

5) issueDate: the datatype (datetime).

id	partID	orderID	quantity	issueDate
339	59	106	2	2020-05-09 10:02:51
340	59	107	1	2020-05-09 10:03:21
341	59	108	4	2020-05-09 10:06:37
342	59	109	1	2020-05-15 12:29:22
343	60	109	1	2020-05-15 12:29:22

Fig. 8. Structure of the table "Receipt"

The table "Orderlist" consists of 2 fields and contains the information of the orderlist in the website as in the fig. 10. It consists of the following fields:

1) id: the primary key for Orderlist table and the datatype (int);

2) userID: the datatype (int).

Fig. 9. Structure of the table "Order list"

The table "Service" consists of 7 fields and contains the information of the services in the website as in the fig. 10. It consists of the following fields:

1) id: the primary key for Service table and the datatype (int);

2) name: the datatype (varchar);

3) description: the datatype (varchar);

4) number: the datatype (varchar);

5) rating: the datatype (double);

6) locationID: the datatype (int);

7) userID: the datatype (int).

id	name	description	number	rating	locationID	userID
1	Workshop IQ	Main Shop		0	1	4
3	Smart Car Services	Seller Shop 1		0	2	5

Fig. 10. Structure of the table "Service"

2.4. Development of the interface

The user interface, also known as Human Machine Interface (HMI) or Man-Machine Interface (MMI), is the aggregate of means by which users interact with the system – a particular machine, device, computer program or other complex tool. The part of an interactive computer program sends messages to and receives instructions from a terminal user. User Interface Design and Ergonomics deals with analysis, design, implementation and evaluation of user interface design [14].

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We will implement future views of an application. Fig. 11 shows the main page for the web site of a system for online workshop.

Fig. 11. The main page

Each website contains many interfaces and allows the user to move between the interfaces and to summarize the interfaces in our website.

This is a tree, and it's a schema of available interfaces for admin, seller and customer and it contains all the elements in the website and also explains the process of moving from one to another shown below fig. 12, fig. 13 and fig. 14.
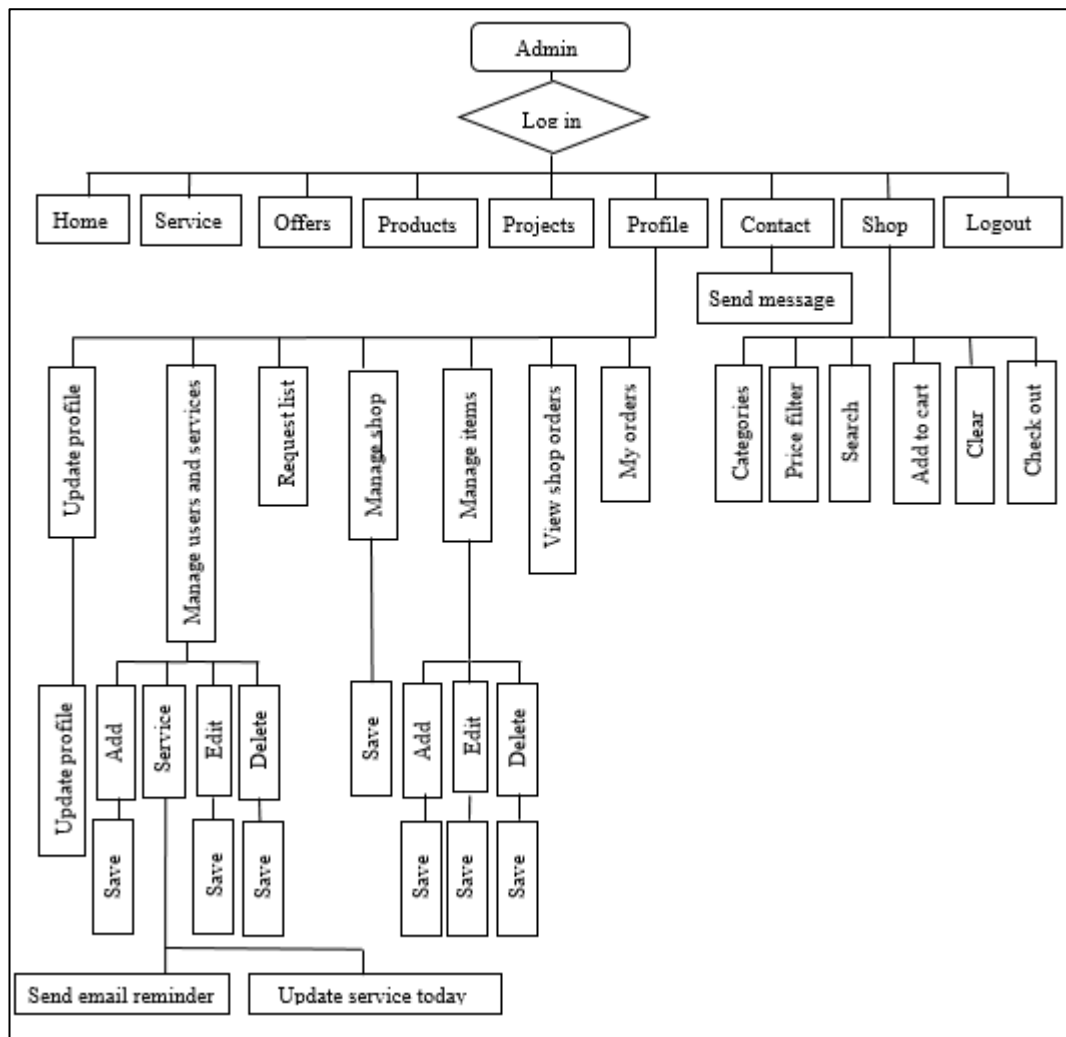
Fig. 12. Schema of available interfaces for admin

Fig. 13 shows the schema of available interfaces for customer.
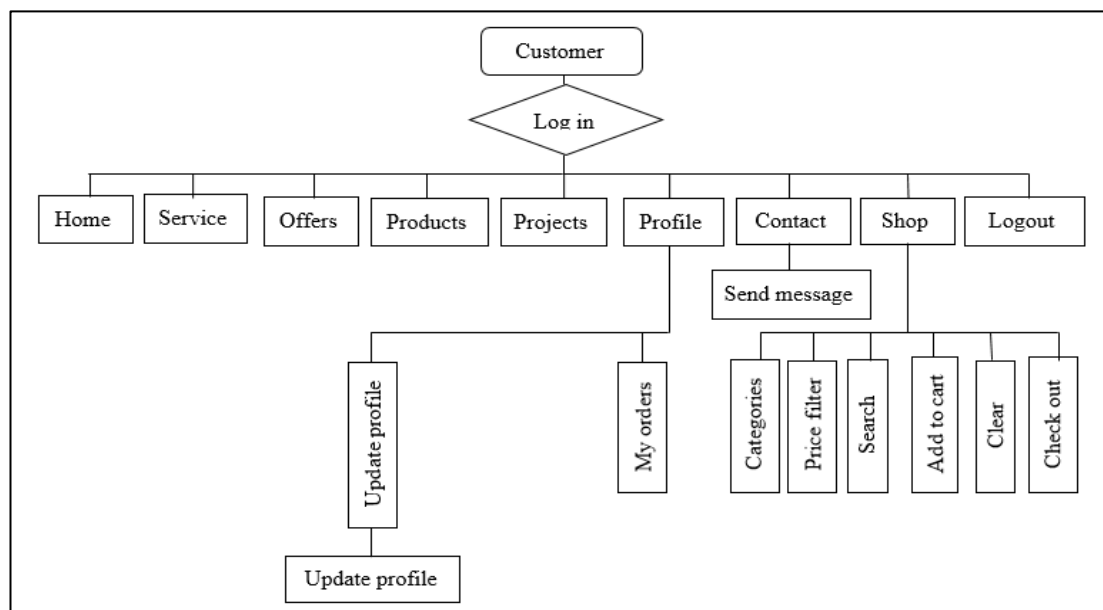
Fig. 13. Schema of available interfaces for customer

Fig. 14 shows the schema of available interfaces for seller.
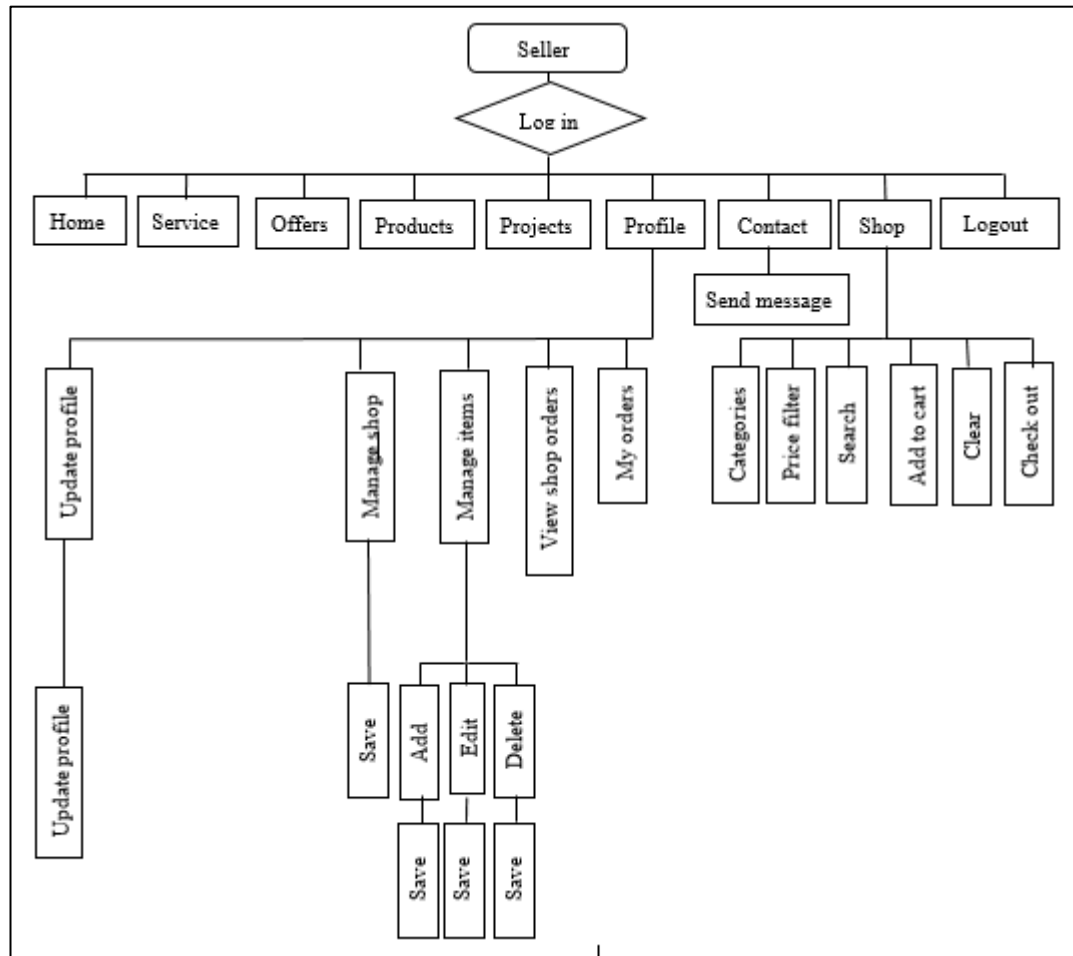
Fig. 14. Schema of available interfaces for seller

3. IMPLEMENTATION OF THE WEB-APPLICATION

3.1. Architecture of the system

Component diagram is a special kind of diagram in UML. It does not describe the functionality of the system but it describes the components used to make those functionalities [9]. Component diagrams are used to describe the physical artifacts of a system [9]. This artifact includes files, executables, libraries, etc. Laravel applications follow the traditional Model-View-Controller design pattern, where we use:

1) Controllers to handle user requests and retrieve data, by leveraging Models;

2) Models to interact with your database and retrieve your objects' information;

3) Views to render pages. Additionally, routes are used to map URLs to designated controller actions. Fig. 15 below shows the structural relations between components in the website.
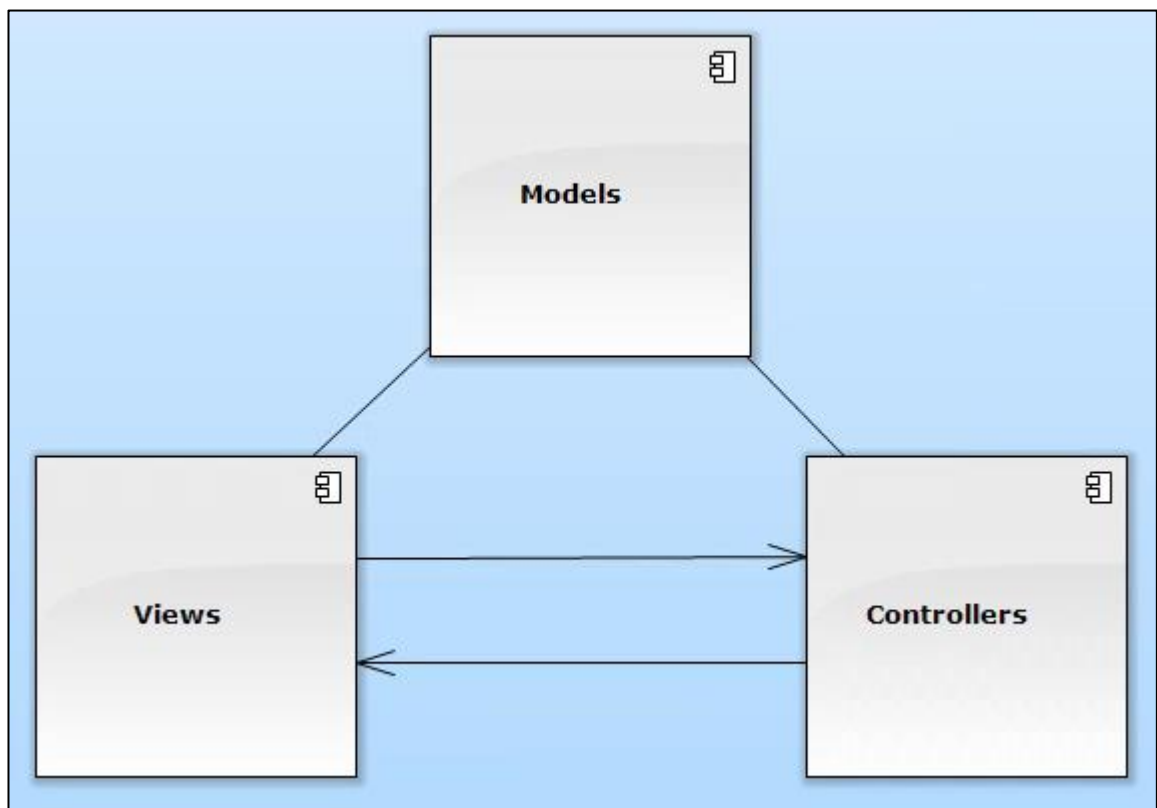
Fig. 15. Component diagram

3.2. Several fragments of PHP-code for implementing the basic functionality

In this part I will view several fragments of PHP-code for implementing that includes the main functions.

Register in the system. Fig. 16 shows the function for the user to register in the system by entering his information like his "User Name", "Password", "First Name", "Last Name", "Mobile number", and "Email".

```php
<?php
session_start();

function Insert(){
include '../common/config.php';
    $username=$_POST['usernameInput'];
    $password=$_POST['passwordInput'];
    $firstName=$_POST['firstName'];
    $lastName=$_POST['lastName'];
    $mobile=$_POST['mobile'];
    $email=$_POST['email'];

 $query = "INSERT INTO `users` (`id`,`username`,`password`,`first_name`,`last_name`,`mobile`,`email`,`role`)
VALUES (NULL,'$username','$password','$firstName','$lastName','$mobile','$email','customer')";

$mysqli = new mysqli($mysqlServer,$mysqlUserName,$mysqlPassword,$mysqlDbName);

// Perform a query, check for error
if (!$mysqli -> query($query)) {
  $error=$mysqli -> error;
 if($error=="Duplicate entry '$username' for key 'username'")
 {
     // duplicate username
     $_SESSION['message'] = "Sign up failed - Username already exists";
     $_SESSION['mType'] = "danger ";
     header("Location: /signup.php");
 }
 else
   {
     $_SESSION['message'] = "Sign up failed";
     $_SESSION['mType'] = "danger ";
     header("Location: /signup.php");
 }
}
 else
 {
    // if successful
    $_SESSION['message'] = " You have signed up successfully, <strong><a href='login.php'>Login</a></strong> ";
    $_SESSION['mType'] = "success ";
    header("Location: /signup.php");
}

$mysqli -> close();

}

if(isset($_POST['insert'])){
   Insert();
}

?>
```

Fig. 16. Function for sign up

Fig. 17 shows the Function for customer service.

```php
<?php
  if(!isset($_SESSION))
    {
        session_start();
    }
  require_once 'config/conn.php';


function Update($id){
   $customer_id=$_POST['id'];



   $query = "INSERT INTO services_log(customer_id) VALUES ('$customer_id') ON DUPLICATE KEY UPDATE last_service = CURRENT_TIMESTAMP";
  $exe = mysqli_query(Connect(),$query);
  if($exe){
     // if successful
     $_SESSION['message'] = " Service Date Updated ";
     $_SESSION['mType'] = "success ";
     header("Location: /customerService.php?id=$customer_id");
   }
   else{
     $_SESSION['message'] = " Update failed ";
     $_SESSION['mType'] = "danger ";
     header("Location: /customerService.php?id=$customer_id");
   }
}

  if(isset($_POST['update'])){
   Update($_POST['id']);
 }


?>
```

Fig. 17. Function for customer service

Fig. 18 shows the Function for admin update profile.

```php
<?php
  if(!isset($_SESSION))
    {
        session_start();
    }
  require_once 'config/conn.php';

function Update($id){
   $username=$_POST['username'];
        $password=$_POST['password'];
        $first_name=$_POST['first_name'];
        $last_name=$_POST['last_name'];
        $mobile=$_POST['mobile'];
     $email=$_POST['email'];
        $role=$_POST['role'];

   $query = "UPDATE `users` SET `username` = '$username',`password` = '$password',`first_name` =
   '$first_name',`last_name` = '$last_name',`mobile` = '$mobile',`email` = '$email',`role` = 'admin' WHERE  `id` =  '$id'";
  $exe = mysqli_query(Connect(),$query);
  if($exe){
     // if successful
     $_SESSION['message'] = " Your profile has been updated ";
     $_SESSION['mType'] = "success ";
     header("Location: /updateProfile.php");
   }
   else{
     $_SESSION['message'] = " Update failed, username is already taken";
     $_SESSION['mType'] = "danger ";
     header("Location: /updateProfile.php");
   }
}

  if(isset($_POST['update'])){
   Update($_POST['id']);
 }

?>
```

Fig. 18. Function for admin update profile

Fig. 19 shows the Function for price filter.

```
function priceFilter() {

    var input, filter, mainDiv, shopItem, itemPrice, i, priceValue
;    min = document.getElementById("min-price");
    max = document.getElementById("max-price");


    filterMax = max.value;


if(min && min.value) filterMin = min.value;
else filterMin=0;

if(max && max.value) filtermax = max.value;
else filterMax=100000000000;

/*alert("Min="+filterMin);
alert("Max="+filterMax);*/

    mainDiv = document.getElementById("items-main-div");
    shopItem = mainDiv.getElementsByClassName("single-shop-item");

    for (i = 0; i < shopItem.length; i++) {
        itemPrice = shopItem[i].getElementsByClassName("price-filter")[0];

 priceValue = parseInt(itemPrice.textContent);//|| itemPrice.innerText;

        // alert(priceValue);
        if (priceValue > filterMin) {
            if (priceValue < filterMax) shopItem[i].style.display = "";
            else shopItem[i].style.display = "none";
        } else {
            shopItem[i].style.display = "none";
        }

    }
}
```

Fig. 19. Function for price filter

Fig. 20 shows the Functions for clear keywords and search keywords.

```
function clearKeyword(){
        document.getElementById("keyword-search").value='';
        searchKeyword();
    }
function searchKeyword() {
    var input, filter, mainDiv, shopItem, itemName, i, txtValue;
    input = document.getElementById("keyword-search");
    filter = input.value.toUpperCase();
    mainDiv = document.getElementById("items-main-div");
    shopItem = mainDiv.getElementsByClassName("single-shop-item");
    for (i = 0; i < shopItem.length; i++) {
        itemName = shopItem[i].getElementsByTagName("h4")[0];
        txtValue = itemName.textContent || itemName.innerText;
        if (txtValue.toUpperCase().indexOf(filter) > -1) {
            shopItem[i].style.display = "";
        } else {
            shopItem[i].style.display = "none";
        }
    }
}
```

Fig. 20. Functions for clear keywords and search keywords

Fig. 21 shows the Functions for add item.

```php
function Insert(){
    $categoryID=$_POST['categoryID'];
        $name=$_POST['name'];
        $description=$_POST['description'];
        $price=$_POST['price'];
        $centerID=$_POST['centerID'];
    $image = addslashes(file_get_contents($_FILES["image"]["tmp_name"]));

    $query = "INSERT INTO `parts` (`id`,`categoryID`,`name`,`description`,`price`,`centerID`,`image`)
VALUES (NULL,'$categoryID','$name','$description','$price','$centerID','$image')";
$exe = mysqli_query(Connect(),$query);
    if($exe){
        // if successful
        $_SESSION['message'] = " Item added ";
        $_SESSION['mType'] = "success ";
        //print_r($_POST);
        header("Location: /manageItems.php");
    }
    else{
        $_SESSION['message'] = " Item was not added ";
        $_SESSION['mType'] = "danger ";
        //print_r($_POST);
        header("Location: /manageItems.php");
    }
}
```

Fig. 21. Functions for add item

Fig. 22 shows the Functions for update users.

```php
function Update($id){

    $role=$_POST['role'];

if($role=='seller' || $role=='admin')
{
    $name="Shop Name";
    $description="Shop Description";
    $number='000000000';
    $rating='0';
    $locationID='0';
    $userID=$_POST['id'];

$query2 = "INSERT INTO `service` (`id`,`name`,`description`,`number`,`rating`,`locationID`,`userID`)
VALUES (NULL,'$name','$description','$number','$rating','$locationID','$userID')";
    $exe2 = mysqli_query(Connect(),$query2);

}

    $query = "UPDATE `users` SET `role` = '$role' WHERE  `id` =  '$id'";
$exe = mysqli_query(Connect(),$query);
    if($exe){
        // if successful
        $_SESSION['message'] = " User Data Updated ";
        $_SESSION['mType'] = "success ";
        header("Location: /manageUsers.php");
    }
    else{
        $_SESSION['message'] = " Update Failed ";
        $_SESSION['mType'] = "danger ";
        header("Location: /manageUsers.php");
    }
}
```

Fig. 22. Functions for update users

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Fig. 23 and fig. 24 show the Functions for order lists.


```php
            <section id="checkout-content">
                <div class="container">

            <?php
if(isset($allOrdersForUser))  {
foreach ($allOrdersForUser as $singleOrder) {

    $totalPrice=0;
    $ga = GetAllReceiptOrders($singleOrder['id']);
    //var_dump($ga);

echo '
<div class="col-lg-12 col-md-5 col-sm-12 col-xs-12 mb-3">
                        <div class="section-title">
                        <h2>Order  ID: <span style="font-size: 1em; color: #d0982f;">'.$ga[0]['id'].'</span> ,
                        Ordered on <span style="font-size: 1em; color: #d0982f;">'.$ga[0]['issueDate'].'</span></h2>
                        </div>
                        <div class="row">
                            <div class="col-lg-12 order-box">
                                <ul>
                                    <li>Products <span>Total</span></li>';
        foreach($ga as $data){
          // echo $data['id'];
    $rowPrice=$data['price']*$data['quantity'];
    $totalPrice+=$rowPrice;

echo '
                                    <li>'.$data['name'].' X '.$data['quantity'].' <span>$'.$rowPrice.'</span></li>
```
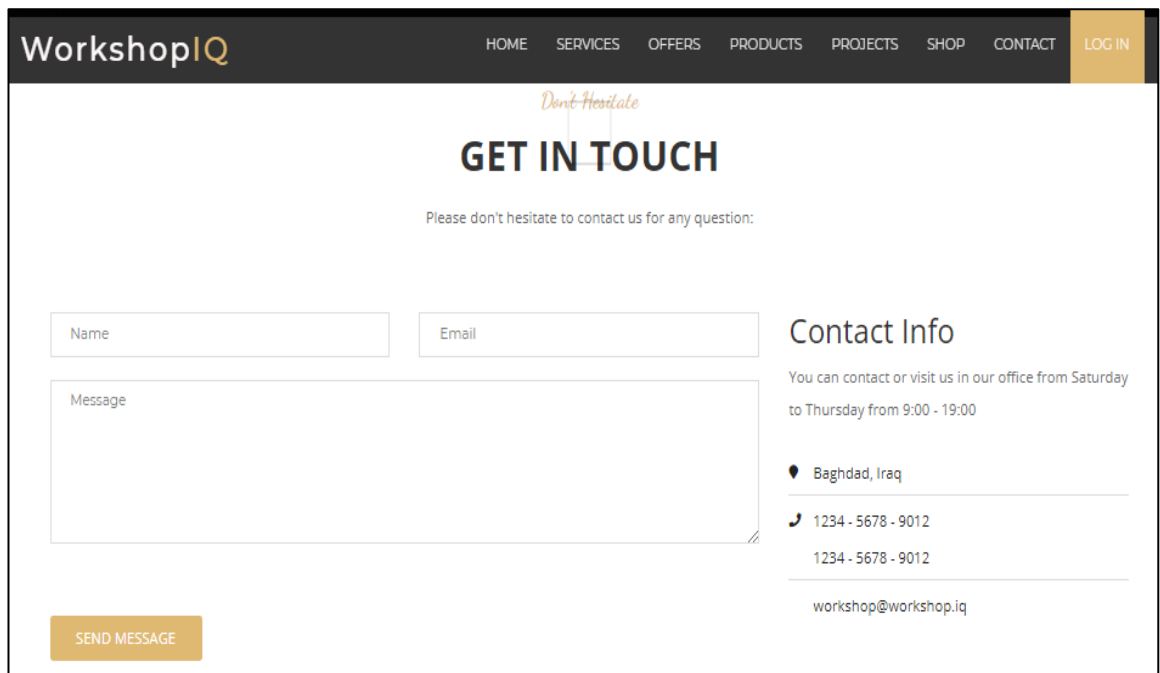
Fig. 23. Functions for order lists


```php
    ';
  }
  echo '                                   <li class="total "><b>TOTAL</b> <span class="bold">$ '.$totalPrice.'</span></li>
                            </ul>
                        </div>
                    </div>
                </div>

<h1 class="mb-3"><br> </h1>';

}

}
else
{
    echo '
<div class="col-lg-12 col-md-5 col-sm-12 col-xs-12 mb-3">
    <h3><i class="fas fa-times-circle"></i> You don\'t have any orders yet.</h3>
    <br>
    <a href="shop.php"><h4><i class="fas fa-store"></i> Go to shop</h4></a>
    </div>
    ';
}
                ?>
                </div>
            </section>
```

Fig. 24. Function for order lists

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4. TESTING OF THE WEB APPLICATION

WEB TESTING, or website testing is checking your web application or website for potential bugs before its made live and is accessible to general public. Web Testing checks for functionality, usability, security, compatibility, performance of the web application or website[6].

In the main page of the site there are many buttons and each one is responsible for a specific functions as shown in the fig below we see the first button is HOME, SERVICESES, OFFERS, PRODUCTS, PROJECTS, SHOP, CONTACT, LOG IN and also we have the company number ,email and the working days and hours as shown below (fig. 25).
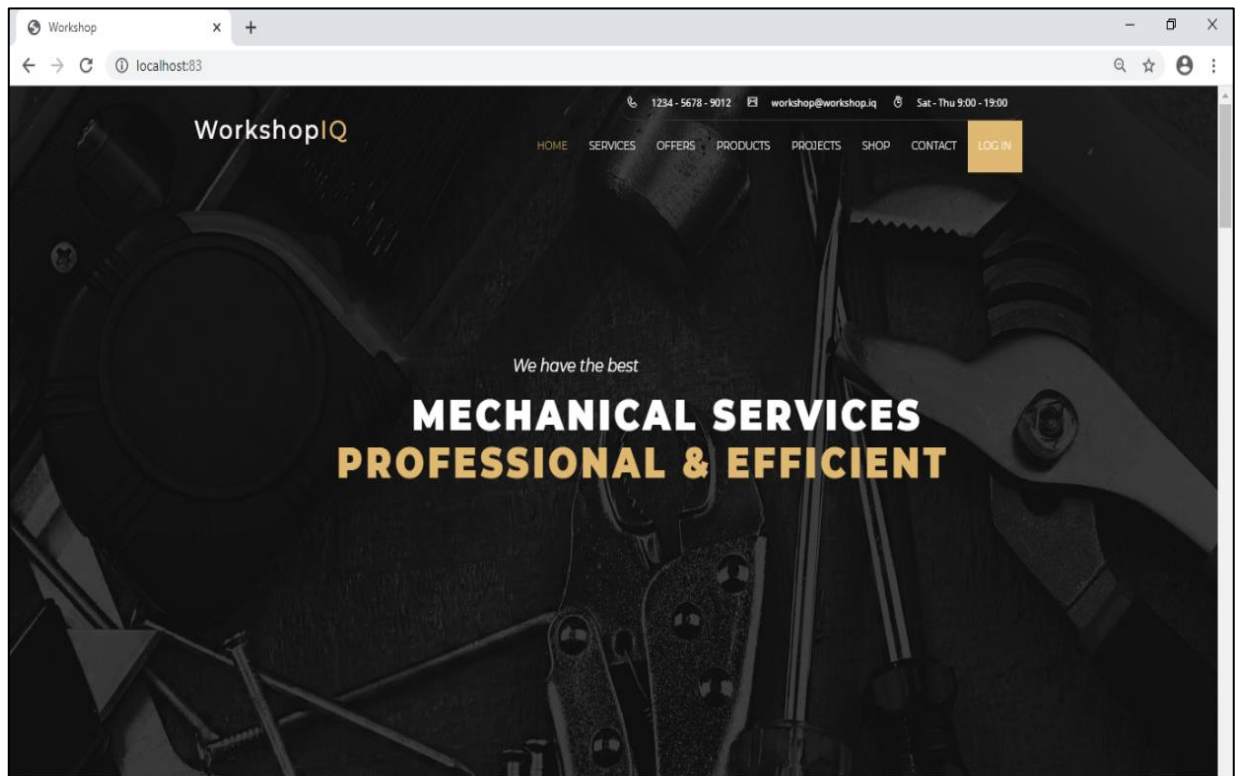
Fig. 25. The home page

When clicking on the "SERVICES" button we will notice that the page will scroll down automatically to a new slide in the same page contain a description of the Company services, Random advertisement for a random company and Request quote form as shown below (fig. 26).

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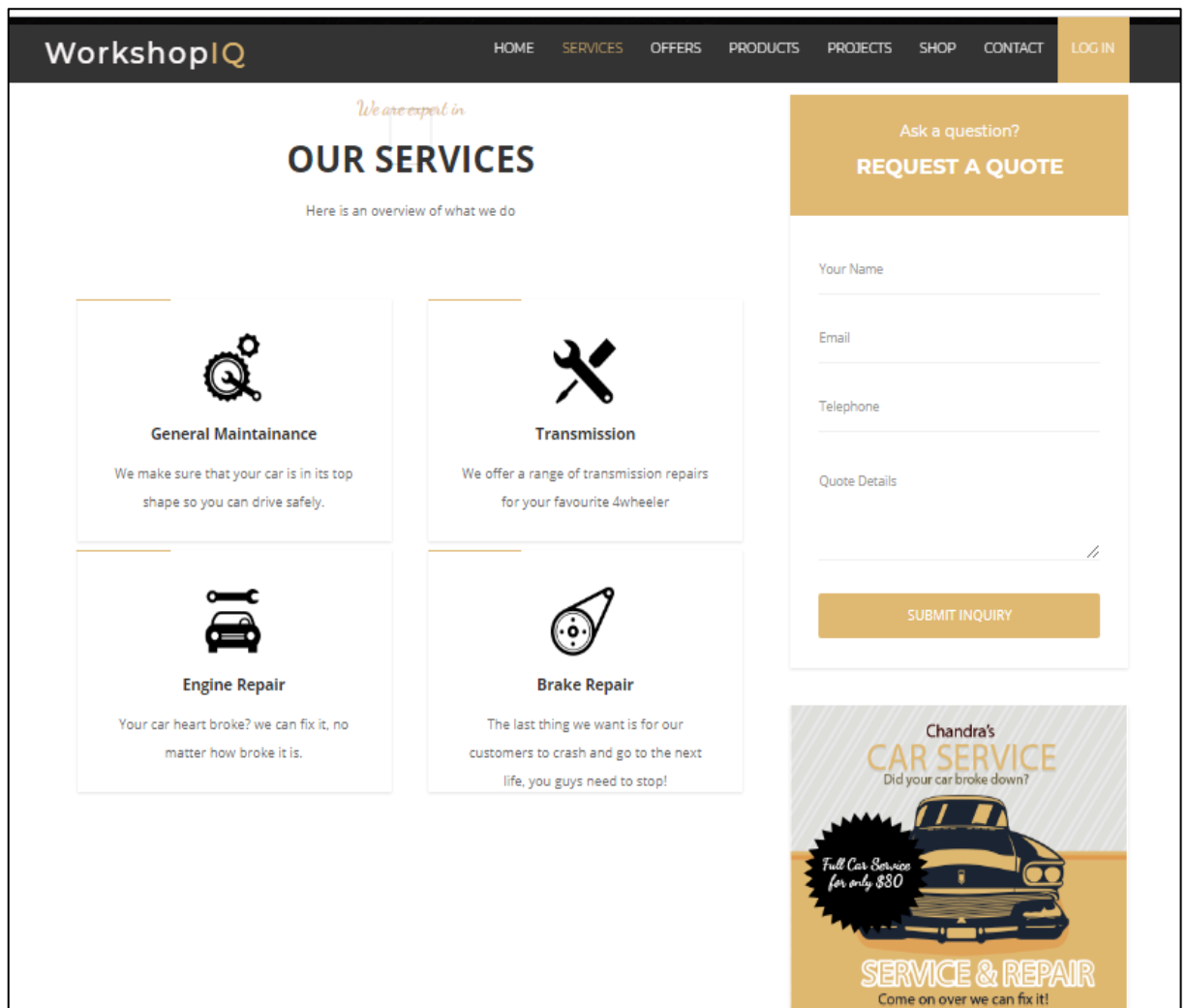
Fig. 26. The Services page

In request quote form it can used by the user to ask a question by using his information name, email, telephone and quote details and this request will showing in the requests list which is available for admin and there the admin can mark it as read if he see it as shown below (fig. 27).

When clicking on the "OFFERS" button we will notice that the page will scroll down automatically to a new slide in the same page contain some offers from other workshops as shown below (fig. 28).

When clicking on the "PRODUCTS" button we will notice that the page will scroll down automatically to a new slide in the same page contain some of our best products as shown below (fig. 29).

Fig. 27. The request list page

Fig. 28. The Offers page

Fig. 29. The Products page

When clicking on the "Projects" button we will that the page will scroll down automatically to a new slide in the same page contain a collection of some of our projects throughout the years and also contain a filter to show all the projects or specific project as shown below (fig. 30).
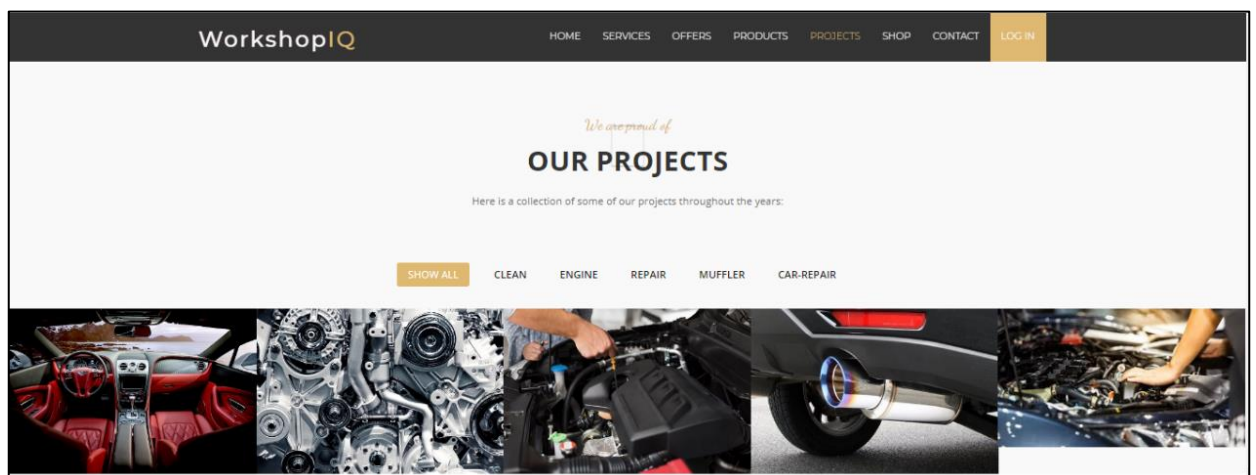
Fig. 30. The Projects page

When the user clicking on the button "SHOP" we will notice the appearance of new page contain products, user's cart, search bar, categories and price filter as shown below (fig. 31).
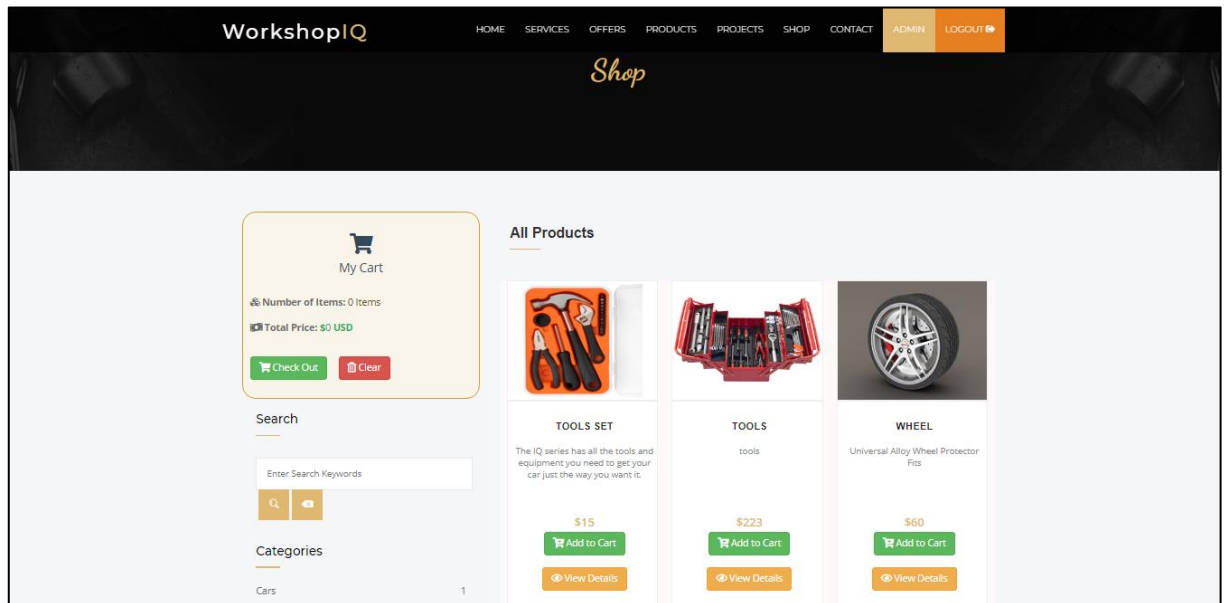
Fig. 31. The shop page

When the user want to buy any products he can by simply just click on the button "add to cart" and it will automatically add to his cart, The user's cart contain number of items and total price, also contain two buttons "check out" and "clear". When the user click on the button "check out" we will notice the appearance of new page contains the orders list of the user as we saw before (fig. 14). When the user click on the button "clear" it will cleared his cart as shown below (fig. 32).
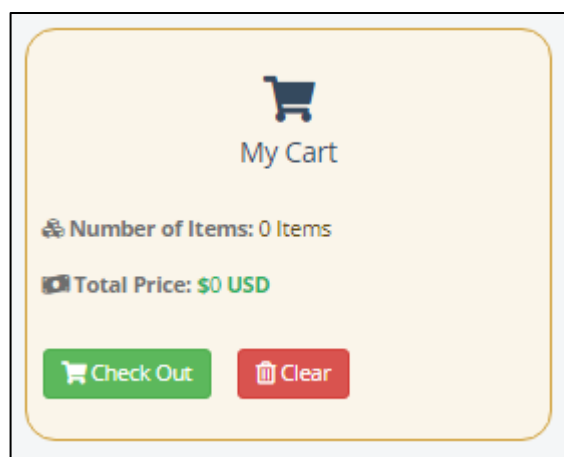
Fig. 32. The user's cart

If the user do not find the product that he want he can search on it by using the search bar or using the categories and also can use the price filter to make price range to help him to found a product with the money that he have as shown below (fig. 33).

Fig. 33. The search form

When clicking on the "Contact" button we will notice the appearance of new page contain a form consist of 3 fields name, email and message, so the user can fill it and press the button send message to get in touch with the site, also this page have contact information like working date, address, telephone and email as shown below (fig. 34).

Fig. 34. The contact page

When scroll down to the same page it shows the location of the workshop in the map as shown below (fig. 35).
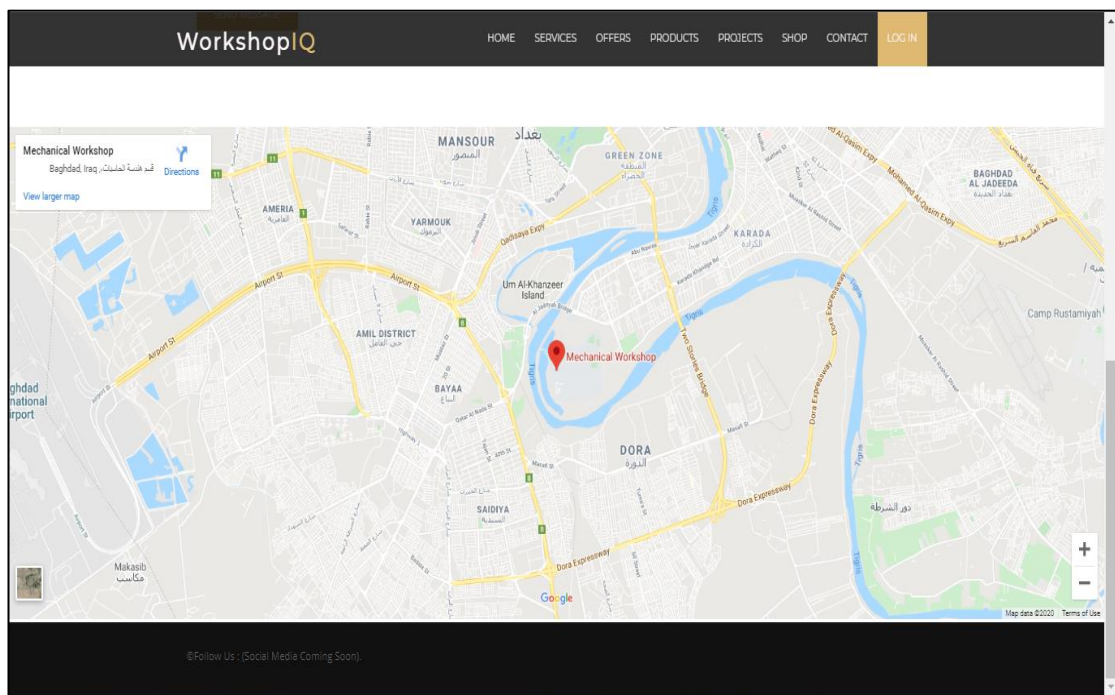
Fig. 35. The workshop location

At the end of the page we will notice the appearance of the Partners that we deal with as shown below (fig. 36).
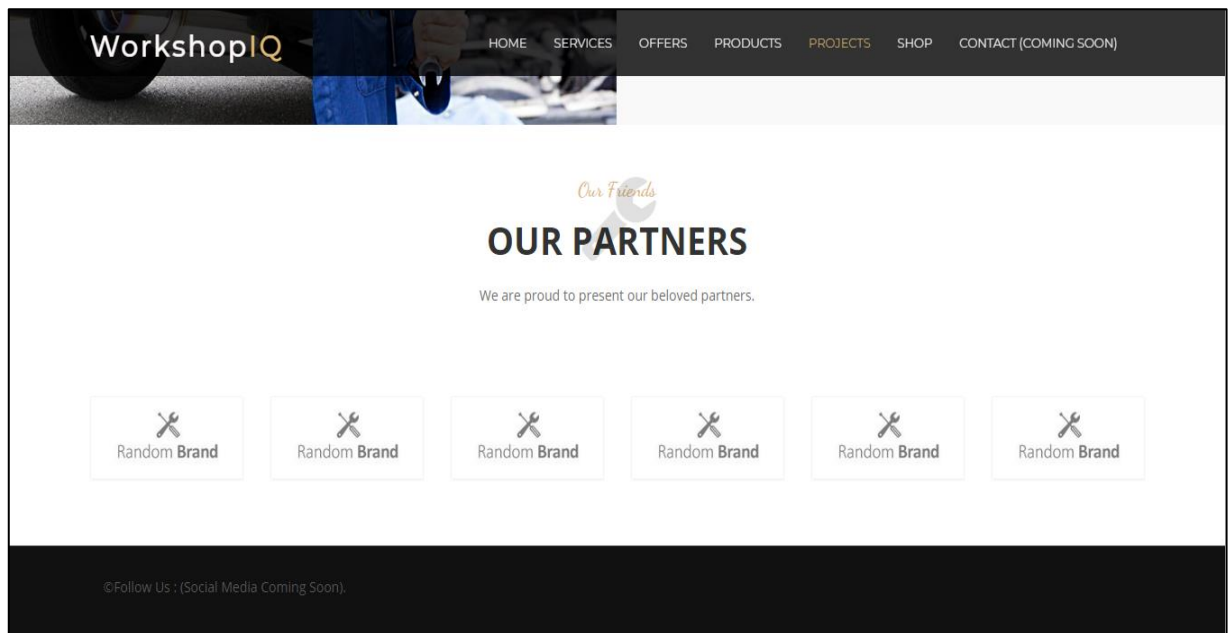
Fig. 36. Partners

I have in my website three modules the first one is admin, the second one is a seller and third one is customer every one of them have function which available for him.

The admin, seller and customer can login to the website by entering them special username and password to login in the website as shown in the fig. 37.

Fig. 37. The login page

If the user don't have account he can just click on "SIGN UP NOW" and a new page open for him and he must enter his username, password, first name, last name, mobile number and email then click on button "SIGN UP" to create his new account as shown in the fig. 38.
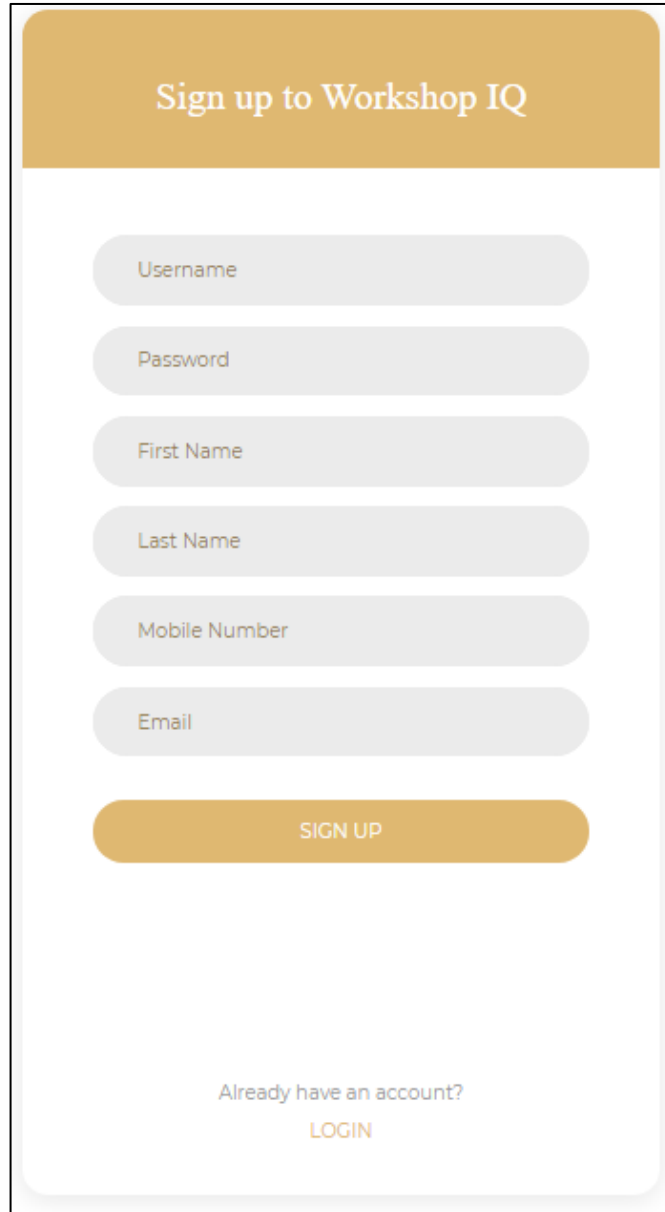
Fig. 38. The Sign up page

After the admin login in to the website and entered to the homepage he can go to the button "ACCOUNT", we will see in account page seven functions update profile, manage users & services, manage items, manage shop, my orders, view shop orders and requests list. absolutely all function will available for admin but not all will available for seller and customer as shown in the fig. 39.
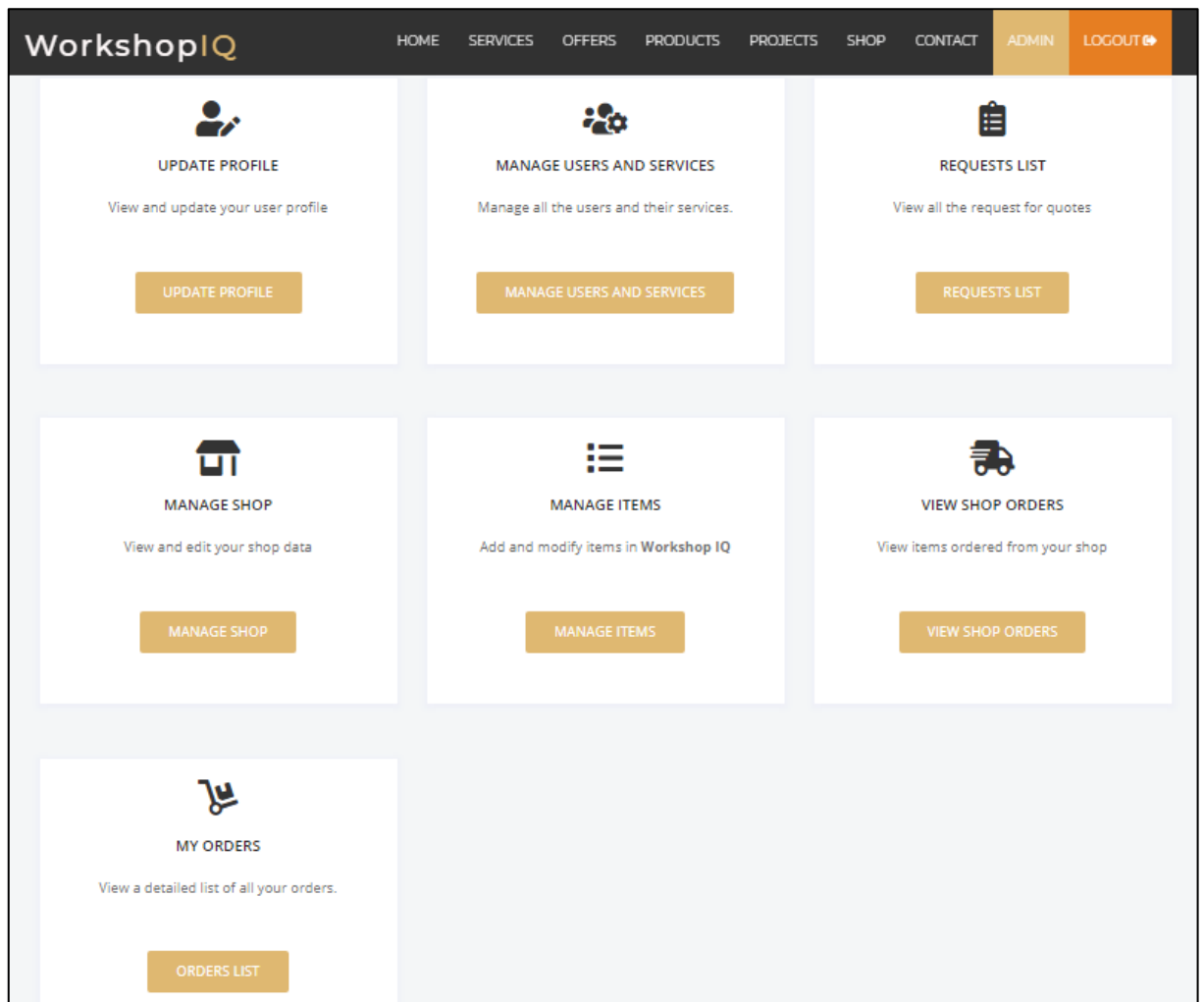
Fig. 39. Admin profile page

When clicking on the function "update profile" we will notice the appearance of new page and the admin can change first name, last name, user name, password, mobile and email and then press the button "update profile" as shown in the fig. 40.

When the admin clicking on the function "manage users and services" we will notice the appearance of new page and the admin can add, edit and delete user, also make action for services as shown in the fig. 41.

When the admin clicking on the button "add new user" we will notice the appearance of new page and the admin can fill the fields username, password, first name, last name, mobile number, email and also can chose the role of the user if he is admin, seller or customer. After the admin fill all the information then he press the button "save" as shown in the fig. 42.

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Fig. 40. Update profile page

Fig. 41. Manage users and services page

Fig. 42. Add new user page

When the admin clicking on the button "Edit" we will notice the appearance of new page and the admin can only change the role of the user as shown in the fig. 43.

When the admin clicking on the button "service" we will notice the appearance of new page and the admin can click on the button "update service today" to update the date of service and he can also clicking on the button "send email reminder" this will send an email to the user to remind him about the next service date as shown in the fig. 44.

When the admin clicking on the function "manage items" we will notice the appearance of new page and the admin can add, edit and delete items. Also it shows the shop name, shop owner, city and street as shown in the fig. 45.

Fig. 43. Edit user data page

Fig. 44. Services date page

Fig. 45. Manage item page

When the admin clicking on the button "add a new item" we will notice the appearance of new page and the admin can fill the feilds item category, item name, item description, item price and image upload. Then the admin can press the button "save" to upload the new product to his shop as shown in the fig. 46.

When the admin clicking on the button "edit" we will notice the appearance of new page and the admin can change all the information an all the fields and the press the button "save" to save the changes that he made as shown in the fig. 47.

When the admin clicking on the function "Requests list" we will notice the appearance of new page. It shows all the requests which is sent by the users and the admin can press on the button "Read" if he read the request as shown in the fig. 48.

Fig. 46. Add new item page

Fig. 47. Edit item page

Fig. 48. Requests list page

Fig. 49. Manage shop page

When the admin clicking on the function "View shop orders" we will notice the appearance of new page. Here the admin can see the items which orders from his shop with full information as shown in the fig. 50.
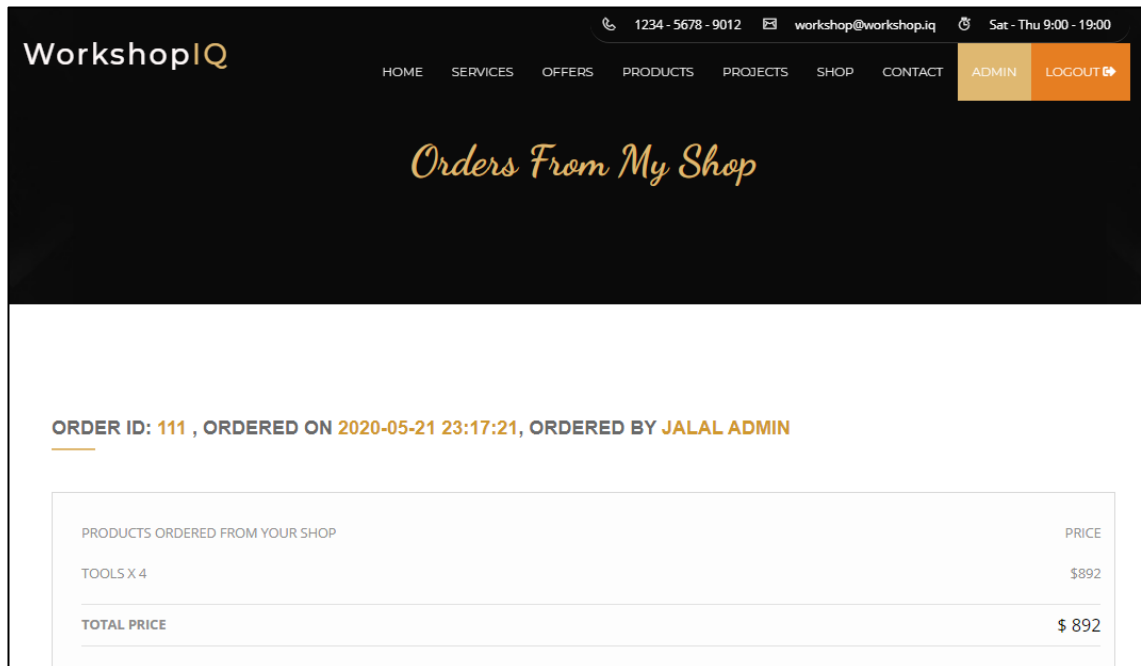

Fig. 50. View shop orders page

When the admin clicking on the function "my orders" we will notice the appearance of new page and the admin can see all the information about the products that he bought as shown in the fig. 51.

Fig. 51. My orders page

After the seller login in to the website and entered to the homepage he can go to the button "ACCOUNT", we will see in account page five functions update profile, manage shop, view shop order, my orders and manage items as shown in the fig. 52.
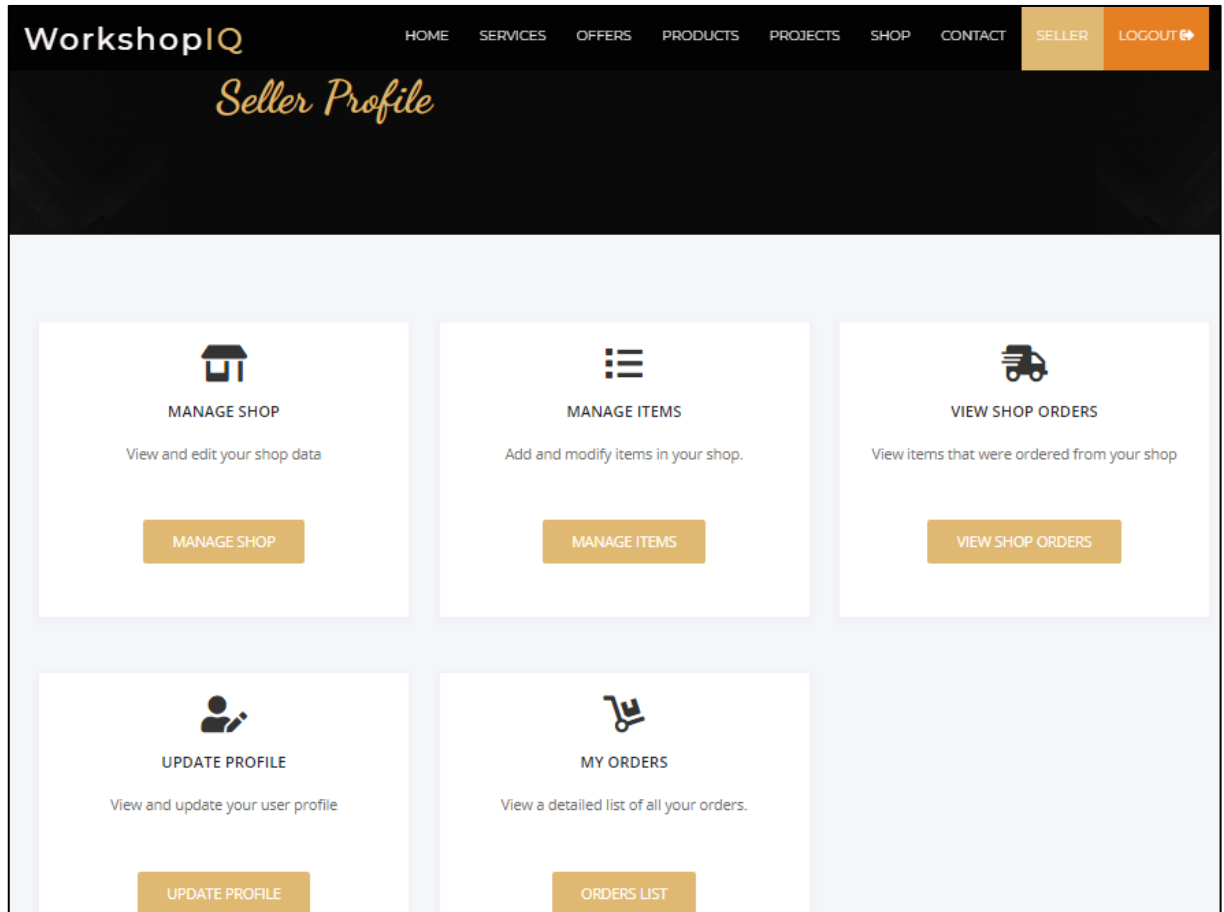
Fig. 52. Seller profile page

The unction "Manage shop" It's the same function for the admin and the seller have the same ability.

The unction "View shop orders" t's the same function for the admin and the seller have the same ability.

The unction "My orders" t's the same function for the admin and the seller have the same ability.

The unction "Manage items" t's the same function for the admin and the seller have the same ability.

When the seller clicking on the function "update profile" we will notice the appearance of new page and the seller can change first name, last name, user name, password, mobile and email and then press the button "update profile" as shown in the fig. 53.
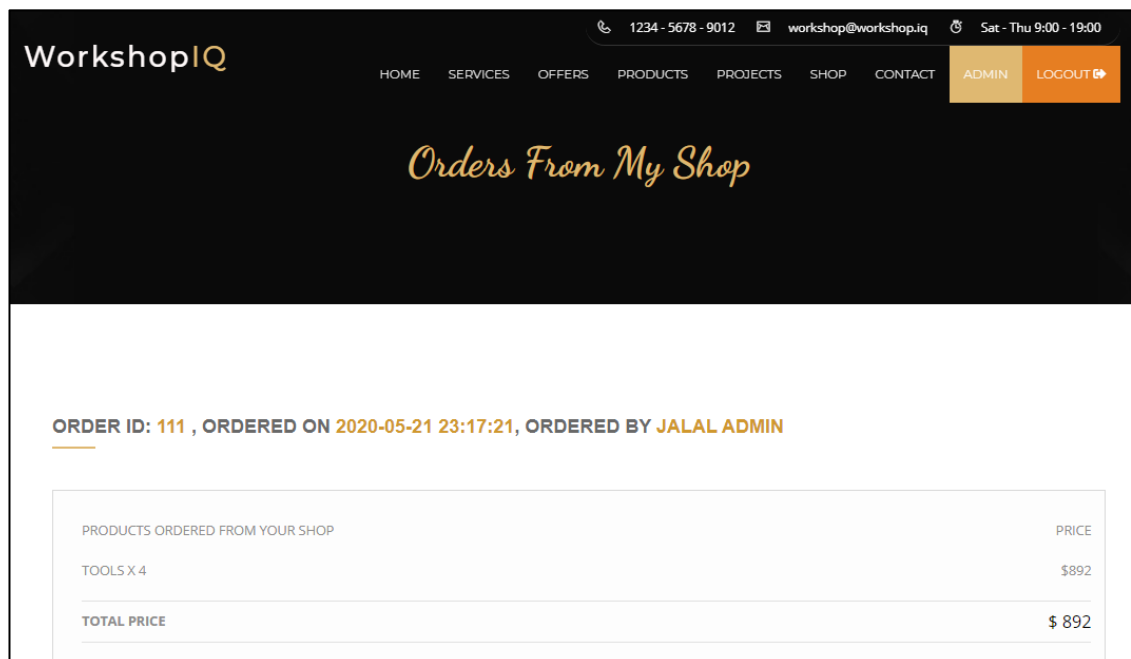

Fig. 53. Update profile page

After the customer login in to the website and entered to the homepage he can go to the button "ACCOUNT", we will see in account page two functions update profile and my ordersas shown in the fig. 54.

When the customer clicking on the function "update profile" we will notice the appearance of new page and the customer can change first name, last name,

user name, password, mobile and email and then press the button "update profile". It's the same function for the seller.
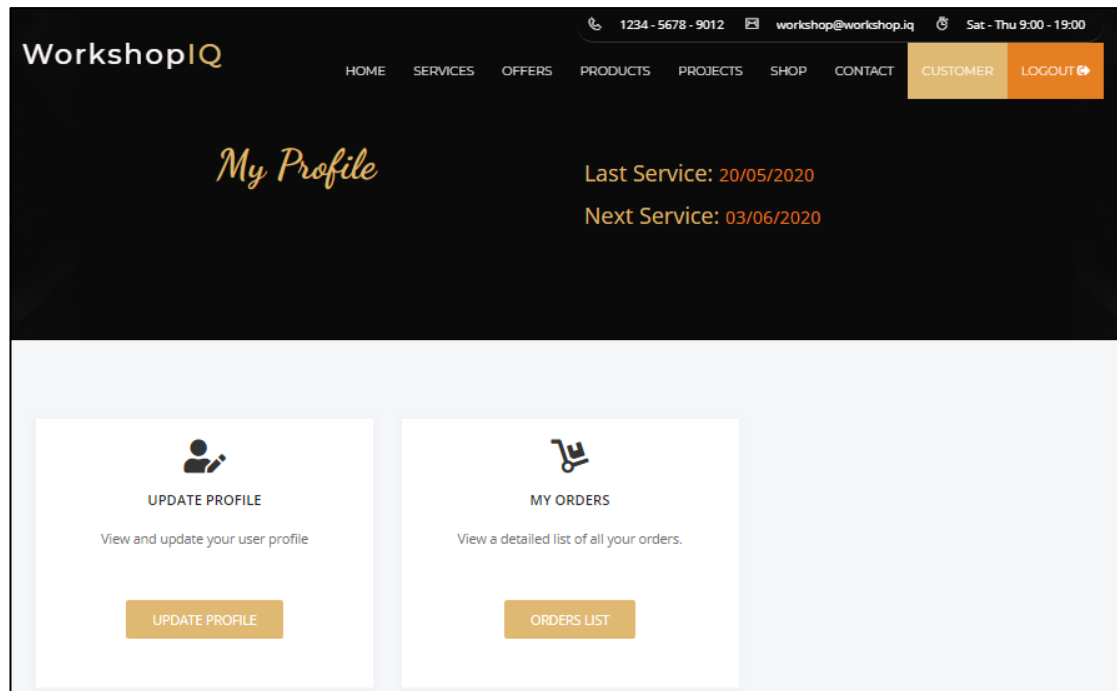

Fig. 54. Customer profile page

When the customer clicking on the function "my orders" we will notice the appearance of new page and the customer can see all the information about the products that he bought.

CONCLUSION

The conclusion is intended to help the reader understand why your research should matter to them after they have finished reading the paper. A conclusion is not merely a summary of the main topics covered or a re-statement of your research problem, but a synthesis of key points and, if applicable, where you recommend new areas for future research[19].

The system implemented the basic functions of information website by using core PHP, we achieved all the goals and working with core PHP was a great.

We have achieved all the main functions required; now the admin can do the following functions:

1) manage item;

2) update profile;

3) manage users;

4) manage shop;

5) view shop orders;

6) view a detailed list of all his orders;

7) update last service date for member;

8) make order;

9) check requests.

The seller can do the following functions:

1) manage item;

2) update profile;

3) manage shop;

4) view shop orders;

5) request a service;

6) view a detailed list of all his orders;

7) make order.

The customer can do the following functions:

1) update profile;

2) view a detailed list of all his orders;

3) make order;

4) request a service.

During the developing of the web application, we solved the following tasks:

1) the problem statement and make the comparative analysis of the PHP frameworks and core PHP for website development are studied ;

2) the structure of the required database for the information website are developed;

3) the web-application was designed;

4) implemented the website;

5) the system were tested.

Some function, which we can implement in future:

1) the system must send SMS or email remanding for the next services;

2) to add online pay card so the user can pay his invoice for:

3) to add a rating and comment line so each user can share his opinion on the items.

From this system development process, I learned a lot. Previously, I was mostly learning conceptual information, and also had done some piecemeal exercises, which were very different compared to this system design.

This project gave me a great opportunity, and finally joined together conceptual expertise with practice. Through design of this system, I summed up the following experience: First of all, I recognized the importance of the code standard. Especially in some large-scale projects, there would be hundreds or thousands of functions. If codes were written unstandardized, a series of troubles would appear in the debugging and checking stage.

Finally, I recognized the importance of the debugging method. System debugging process is more complex than the development process. In fact, each operation and each submitting a request to the server includes a lot of small pieces of code execution. If the programmer do not use an appropriate debugging method, he/she will be difficult to identify errors in the program.

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