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Get Your Cut

Technical Report

2015/2016



Declaration Cover Sheet for Project Submission

SECTION 1

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- the imposition of a fine and
- the requirement that a student to attend additional or other lectures or courses or undertake additional academic work.

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Executive Summary

Nowadays booking systems have become the standard for various types of organisation that provide a service. Ranging from hotels and restaurants to booking flights and holidays. Organisations are seeing the benefits of this system as it gives the customer easy accessibility while giving them full control over their time and money.

Get Your Cut is Hybrid application that aims to provide a platform where by customers book haircut/appointment from their mobile device, giving them total control over their time and money. The customer is presented with a list of nearby barbershops to pick from depending on their location or city they are in. They select the desired barbershop and are provided with the menu list and price of the selected barbershop. The customer selects the date and time they want and with the push of a button, they have booked their appointment.

I developed my application using HTML5 CSS and jQuery mobile for my front-end. My application uses MYSQL database which is hosted online via 000webhost to store and retrieving stored data. PHP is the server side language used to communicate with the MYSQL database. I used Ajax to make asynchronous calls to the database and I used JSON to return the value to the client side. I used a mobile development framework called PhoneGap to make the application so it can be installed by Android, iPhone, and Windows.

1 Introduction

1.1 Background

The internet and its technologies has had a massive impact on businesses. It has changed how businesses run. In fact, a host of diverse businesses have been built entirely off the internet platform. For example, Facebook, Twitter, Just-Eat, EBay. The internet has given businesses the opportunity to reach a global audience to offers their services and goods. Through the internet, competition is no longer localized but rather the business can compete on a global platform. But a major asset that the internet provides is advertising. Advertising tools such as websites and search engine optimization SEO, have allowed even the smallest businesses to have an online presence and reach potential consumers.

Nowadays, more people are accessing the internet through their mobile devices. In Ireland alone one third of all web access come from handsets. This increase in mobile access has caused business to ensure that their services are access via smartphones and that they are mobile friendly.

With these discoveries, companies and firms are now using the internet to make and expand their business, making their business models more cohesive, effective and also make life easier for customers. For example, Just-eat made ordering food that much easier by their website which is also mobile friendly, and their phone application.

But I noticed that this wasn't so in the Barbers industry. Although some have websites, a lot of them are just local, unknown to potential customers. The websites themselves were looked outdated and less appealing to customers. So I did some research and I noticed that there was a niche in the market and it was a fairly unexplored market. I noticed a competitor in the UK called Wahanda but from looking at it really gave the impression that it was for females. They focused on saloons and spa mainly. So I saw an opportunity to focus on barbershops because they're were still not entirely given a platform to reach potential

customers in the online space. I believe what sets my application apart is its name as well as the service it provides and the target customers we are trying to reach as there are none that target barbershops specifically.

What sparked this idea was actually because every time I went to the barber shop, there was a queue always waiting for me. So I thought what if there was a way to book haircuts online then coming in to get your haircut without any queue or lines to wait on. And with further discussions with my supervisor I decided to create this application.

This application allows you to search for barbershops around your location, select which barbershop you want, view their services and book the appointment.

1.2 Aims

The purpose of this application is to create a cross platform user friendly application that offers users the capability of booking appointments from barbershops nearby. This application aims to improve the business processes of barbershops by giving them an online platform to reach potential customers. Through research carried out I found that a substantial amount of barbershops have no online presence, they are limited to word of mouth and local residence. This application aims bridge the gap between barbershops and the Online space. Once opened the application will present the user with a login screen. If the user has an account registered already, they can successfully log in. If the user doesn't have an account, they can proceed to the registration page to create an account. Upon log in success, the user is directed to the home page. The user is given the option to search for a barbershop via their location, or search for barbershops by providing what city they are in. After the user has selected his/her option, they are directed to a page with the resulting barbershops on their vicinity. The user can then select a barber shop and they are provided with the shops details and menu. In this page the user can also get directions to the selected barbershop. The user can now select the listed services they provided

by the barbershop. Upon selection, the user selects what date and time they want to book the appointment for, once the appointment is validated/checked in database, the appointment is booked and can be seen in the users appointment/booking page with details of their bookings. The user is also given the option to get directions to the barbershop in which they have book an appointment.

The application should be efficient and perform at a consistent standard. The application must be user friendly and easy to use for potential users. The application must look attractive and must be well displayed on both Android and iPhone devices. The application must fulfil all the requirements that will be specified through out the development cycle which includes, Functional requirements, non functional requirements, user requirements, environmental requirements, and usability requirements. The application must be trust worthy, meaning the application must be secure as it holds users credentials. The application must be protected from MySQL injection, and user password must be encrypted. The system must be robust, meaning that the system doesn't crash on any failures or disturbance.

1.3 Technologies

JQuery Mobile: This is a HTML5 user interface system. It is used to make responsive web applications that are accessible from a smart phone, tablet, and desktop devices. This is the framework I used to create the GUI and user interaction of my application. I choose JQuery mobile because it suited my content driven application. JQuery mobile framework is very modern, its designs are very attractive and of course responsive.

JavaScript/JQuery: JavaScript and jQuery served as my scripting language, they are used in a host of functioning required in my application.

HTML5/CSS: These are my mark up languages which were used in conjunction with the JQuery mobile framework.

AJAX: Ajax was used to make asynchronous calls to the server side. Ajax is a client side script that enables communication with a server without the need for a post back or complete page refresh.

PHP: PHP serves as my server side scripting language. It is used to communicate with make queries to MYSQL database and output JSON encoded results for Ajax to receive.

MYSQL: MYSQL is the database I used to hold, store and retrieve data.

Google Maps API: The Google maps API is used to give the user direction to the barbershops provided in the application.

PHONEGAP: free open source software used to create cross platform applications for IOS devices, Android and windows (FOSS). I used Phone gap to build my hybrid application in android and IOS. Phonegap allowed me to have access to Native device features such as calendar.

PHONEGAP developer: PhoneGap developer allowed me to test how my application looks on the android and IOS platform without having to go through the PhoneGap Command line build functionality.

1.4 Structure

The structure below will be as follows, Requirement which contain functional and non functional requirements. Design and Architecture, which include UML diagrams, use cases, system architecture, hardware and software architecture diagrams. Implementation, Testing, GUI layout, Customer testing, Evaluation and Conclusion.

2 System

2.1 Requirements

The requirements specification is a vital and critical part in the software development lifecycle. To gather the requirements for my project, I did research on the various components needed to create the application to give me a comprehensive description of the purpose and environment of the application under development. Further research was conducted to update the requirement specifications. And regular meetings were arranged with my supervisor to give guidance and direction with the applications functions and specifications.

2.1.1 Functional requirements

This section covers and describes the Functional requirements of the application. It outlines what the application is going to do.

- **Login:** The system must allow the user to login. Using a form page, the user inputs his username and password which is validated and authenticated on the server side.
- **Registration:** The system will allow user to register/create an account. Also using a form page, the user inputs will be his/her username, email and created password.
- **Find barber shops via location:** The system will find the nearest barbershop via the user's location.
- **Find barber shops via city:** The system will find the nearest barbershop via the user's location or city provided.
- **List of Service and price:** system must provide user with the services the barbershop provides and its corresponding price.
- **Appointment booking:** The system will allow user to book appointments.
- **Google maps Direction:** The system will display an on screen map and direction list to the appointed barbershop.

- **List of bookings:** The system will display the list of appointments made by the user.
- **Cancel Appointment:** The system will allow user to book appointments.
- **Rate Barbershop:** System must allow users to rate barbershop.

2.1.2 Non Functional requirements

In contrast to Functional Requirements which deal with “what the system should and must do”, Non-functional requirements focuses on “how the system operates”

2.1.2.1 Performance/Response time requirements

This requirement measures the time interval between the user initiating and action and the system responding to the action invoked. This requirements performance is directly proportional to the internet connection and strength. The greater the internet connection strength, the faster the data is passed and loaded on screen to the user. And likewise the weaker the internet strength the slower data is being transmitted to the user. For my application the response time must be no less than one fifth of a second to the keep the user engaged, provided the application is used in an average strength internet connection.

2.1.2.2 Availability requirement

For Availability requirements I set out to with an objective to make sure that the application as a whole to be ready and available to users 99.9% of the time. All functionalities of the application must be readily available to the user at all times. The users access to constant data should have an availability of 99%. The application should not have more than 4 hours scheduled down time per month, and more than 2 hours of unscheduled down time per month. Availability requirement is directly related to other non functional requirements which affects the availability of the system. These include, Reliability, Security and Robustness.

2.1.2.3 Scalability

Scalability define the capability to the system handle growth in information and access of data. The Application uses MySQL which is a relational database management system. The database model is very scalable and able to cope with large amounts of requests. A technique used in my application is the partitioning of large tables, which are based on key field values.

2.1.2.4 Backup

In the unfortunate situation of data loss or corruption. The applications data is backed up on the server. This provided as standard by the server vendor, 00webhosting.com. The server also provides automated weekly backups ensuring that in the event of data loss or corruption the system is able to recover from it and all the user's and barbershop's data would be intact.

2.1.2.5 Operability

The system must be reliable. Failure in reliability will result in the dissatisfaction of the user. Defining factors that affect reliability of the application will include, Security, Backup, Availability, Robustness and other requirements. The average time between failures in the application should be no less than a month. The probability that application and its components should fail should be less than .010% per year.

2.1.2.6 Security requirement

This requirement is extremely important. If the user doesn't feel secure using the application, they will most likely not use it and uninstall it. The application must have security measures in place to protect it from potential hackers and unauthorized access to the system which holds sensitive data such as the user's credentials. The system must have solid authentication and validation ability to protect unauthorized users logging into the system with in correct credentials. The system must encrypt sensitive information such as the user password. The password in the application are encrypted using MD5 hash. The system also has to be protected from SQL injection. SQL injection is a coded injection technique

used my malicious hackers to attack applications that are data driven. This is done by inserting SQL statements into text fields to perform database queries. For example, SQL statement to drop or delete a database. My application prevents this by using `mysql_real_escape_string ()` to escape special string characters in a string. And for SQL injection involving numerical parameters, I made sure that the variable being sanitized by `mysql_real_escape_string ()` were enclosed between quotes to evade SQL injection.

2.1.3 Data requirements

In this section, the data requirements will be covered. The data requirements are vital to successfully execute implement the core functions of the application.

The database I chose to use is a MYSQL database. The database will be hosted online via the selected provider. The provider I chose is 000webhost. MYSQL is free to use and it suited the functionality of my application. This database is used for login and registration. Holds information on the the barbershop i.e. name, latitude and longitude variables, address. It also holds all the booking made. The Android and IOS application communicates with the database asynchronous requests using Ajax requests.

2.1.4 User requirements

- **Android (4.0 or higher) or iPhone device (7. Or higher):** The user needs either a mobile Android device or iOS device. For android, the version 4.0 or higher works best and loads faster. And for iOS devices, version 7.0 or higher works best.
- **Internet access:** The application is constantly communicating with online servers, so an internet connection is required. The better the internet connection the faster the server post and call requests.

2.1.5 User Requirements Definition

This section describes the set of objectives and requirements for the system from the customer's perspective. What are the clients saying they want?

- System must allow User to create an account and/or log in.

- System must allow User to select a barber shop.
- System must allow User to book an appointment.
- System must allow user to cancel appointment.
- System must allow User to rate barbershop.

2.1.6 Environmental requirements

- **Sublime Text:** This is the IDE I used in for front-end and back-end scripting.
- **Xcode:** IDE used for running test in the simulator.
- **Android Studio:** IDE for developing the android application
- **Internet Access:** required to access the application.
- **Laptop:** This is required for the creation of the system in conjunction with the sublime text IDE.
- **Android:** This is needed to test how the application works on android.
- **IPhone:** This is needed to test how the application works on android.
- **Photoshop/paint:** Used to develop graphics and icons used in the application

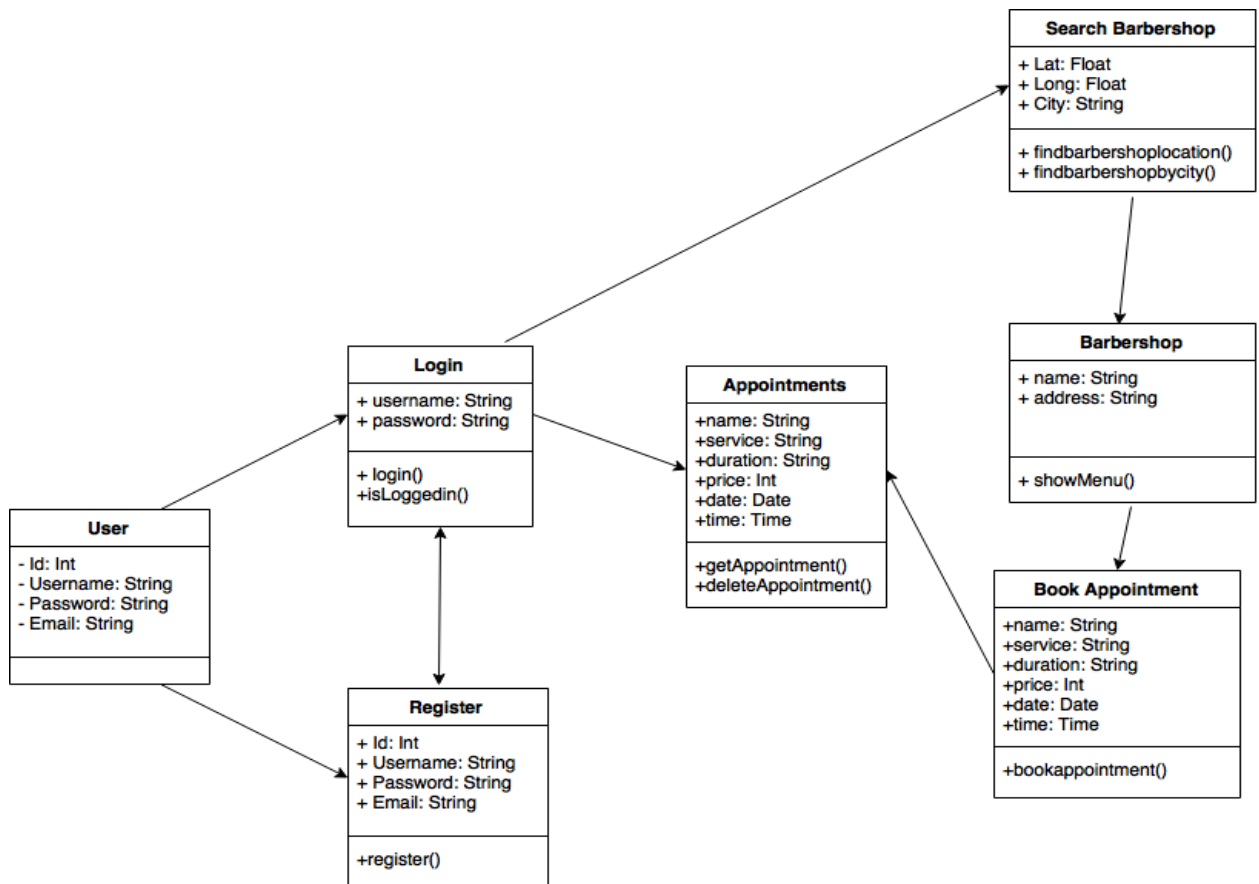
2.1.7 Usability requirements

This section covers the usability requirements for the system application. This outline the standards and objectives to be met in regards to the systems GUI and design process.

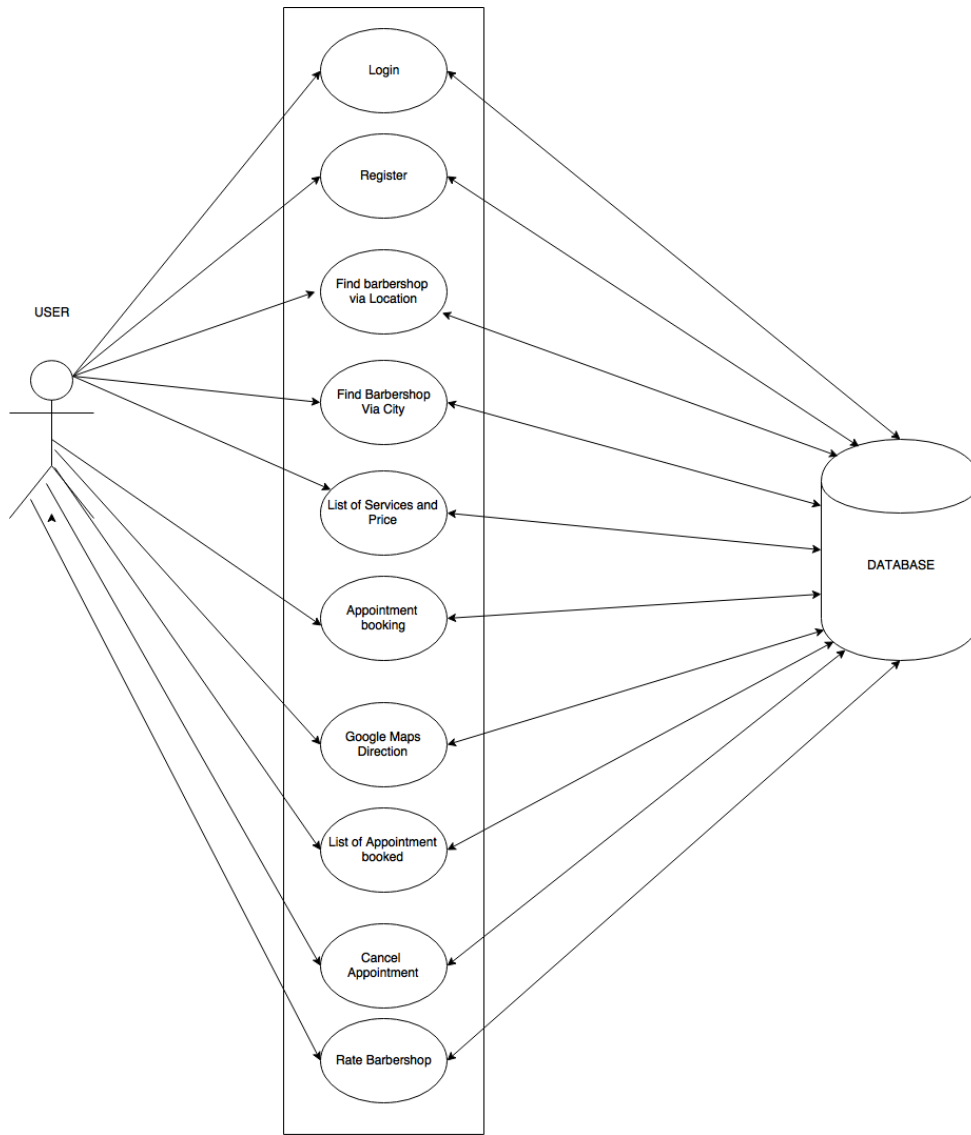
- **Ease of Use:** The application must be user friendly and easy to use. The GUI must be easy to understand efficient.
- **Easy to Remember:** Occasional Users should find the system simple to use.

- **Understandability:** The system must be easily understood by the user.
- **Task Efficiency:** The system must be fluid and efficient. All functions in the system that exceeds .5 seconds will produce an alert box displaying “loading please wait”.
- **Operable:** The application must be cohesive and performs as designed, Errors should be shown in a user friendly format, allowing the user to understand what to do.
- **Attractiveness:** The application must be appealing to the user and should be very modern with its designs and layout. The GUI would be tested on potential users of the application, to engineer the GUI to their view and opinions.

2.2 Design and Architecture



Below is the use class diagram of all the functional requirements.



2.2.1 Requirement 1: User Login/Registration:

2.2.1.1 Description & Priority

The system should allow the user to Login or Register to create an account which gives them access to the application

2.2.1.2 Use Case

Scope

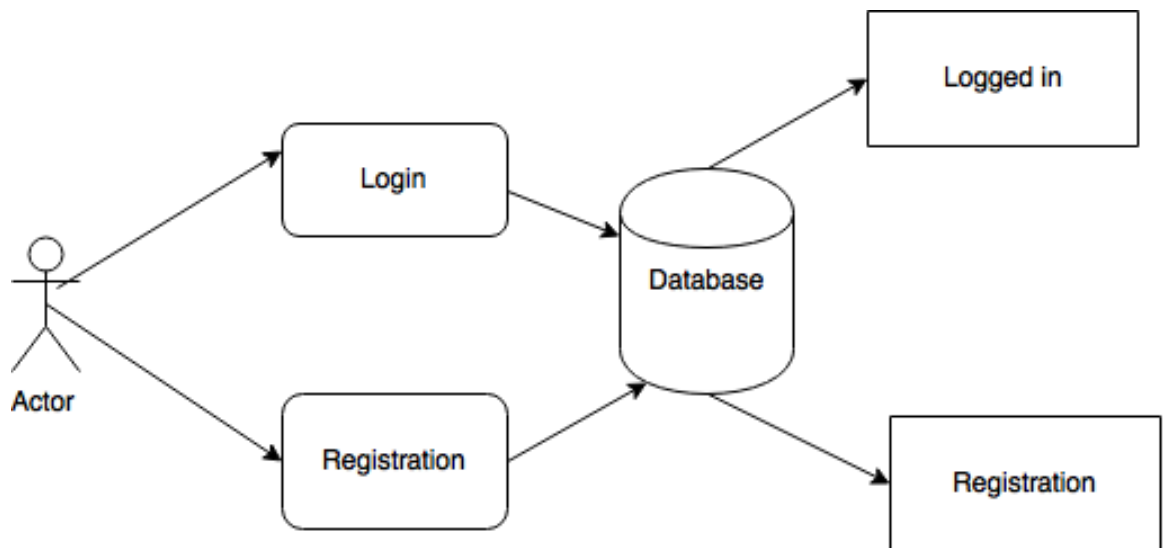
The scope of this use case is to allow the user to login or register

Description

This use case describes the logging in and registration.

Use Case Diagram

Diagram should highlight actors and uses cases.....



Flow Description

Precondition

The system is in initialisation mode.....

Activation

This use case starts when an Attempts to login in.

Main flow

1. The System presents the user with the Login screen.
2. The User inputs his username and password.
3. The System checks if the provided data exists in the database.
4. The System verifies the Users credentials.
5. The System Logs the user in.
6. The System bring user to the homepage of the application.

Alternate flow

A1: Registration

1. The User clicks on register.
2. The System displays the registration page.
3. The User fill in required details.
4. The system validates the details.
5. The System registers the Users detail to the Database.
6. The System registers the User.
7. The system sends the user to the Login page.

Alternative flow

A2: Failed Login

1. The System can't find the user credentials provided in Database.
2. The System displays the error message.
3. The system sends the user to the registration page.

Termination

The use case is terminated when the user is logged in successfully

2.2.2 Requirement 2: Location and listing of Barbershops

2.2.2.1 Description & Priority

The system Should locate and list nearby Barbershops

2.2.2.2 Use Case

Scope

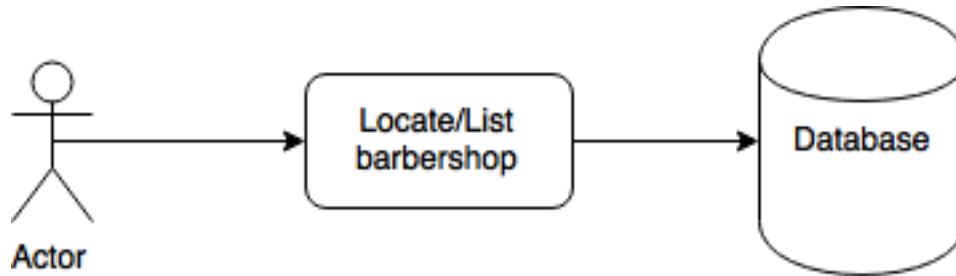
The scope of this use case is to locate and list nearby barbershops

Description

This use case describes the locating and listing of nearby barbershops

Use Case Diagram

Diagram should highlight actors and uses cases.....



Flow Description

Precondition

The User is logged in and on the homepage

Activation

This use case starts when the click on 'Find Nearby barbershop'

Main flow

1. The System uses the Users location and finds the nearest barbershop
2. The System displays a list of all the nearby barber shops

Alternate flow

A1 : Search by City

1. The User inputs what city they are in
2. The System finds barbershop using the city provided by the User

Alternate flow

A2 :Search by city failure

1. The System doesn't have any results for the city provided
2. The System display the message to the user.
3. The System finds barbershop using the User's location

Termination

The Use case is terminated when the User selects one of the listed barbershops.

2.2.3 Requirement 3: Booking appointments

2.2.3.1 Description & Priority

The system allows the user to Book appointments

2.2.3.2 Use Case

Scope

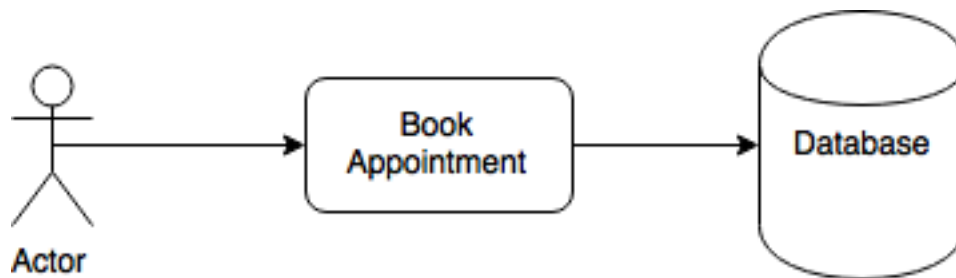
The scope of this use case is to book appointments

Description

This use case describes the booking of appointments

Use Case Diagram

Diagram should highlight actors and uses cases.....



Flow Description

Precondition

The User selects a barbershop

Activation

This use case starts when the click on 'Book Appointment'

Main flow

1. The User selects service they want to book
2. The system checks if the appointment already exists
3. The system confirms that there is record already in the database
4. The System creates the appointment
5. The System notifies the user that the appointment has been made.

Alternate flow

A1: Appointment already exists

1. The System checks if the appointment already exist
2. The System confirms that appointment already exists
3. The System notifies the User.

Termination

The Use case is terminated when the User is notified that their desired appointment has been booked.

2.2.4 Requirement 4: Cancel appointments

2.2.4.1 Description & Priority

The system allows the user to cancel appointments

2.2.4.2 Use Case

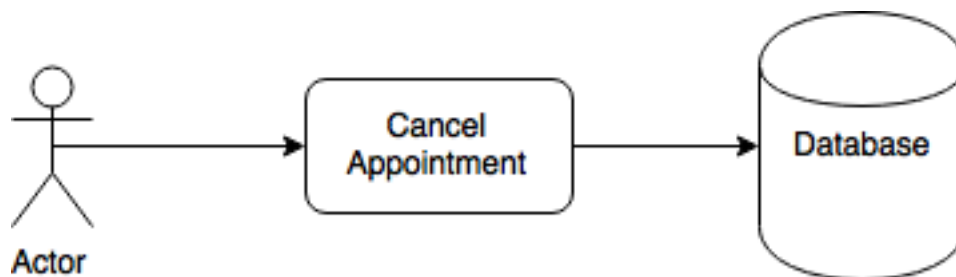
Scope

The scope of this use case is to cancel appointments

Description

This use case describes the cancelling of appointments

Use Case Diagram



Flow Description

Precondition

The User selects a barbershop

Activation

This use case starts when the click on 'Cancel Appointment'

Main flow

6. The System show available bookings to cancel
7. The User selects program to cancel
8. The System cancels the appointment and notifies user.

Alternate flow

A1: No appointments

4. The System cannot locate any bookings to cancel.
5. The System notifies the User.
6. The System provides link to homepage

Termination

The Use case is terminated when the appointment has been cancelled.

2.2.5 Requirement 5: Google maps Direction

2.2.5.1 Description & Priority

The system allows the user to get directions to a barbershop

2.2.5.2 Use Case

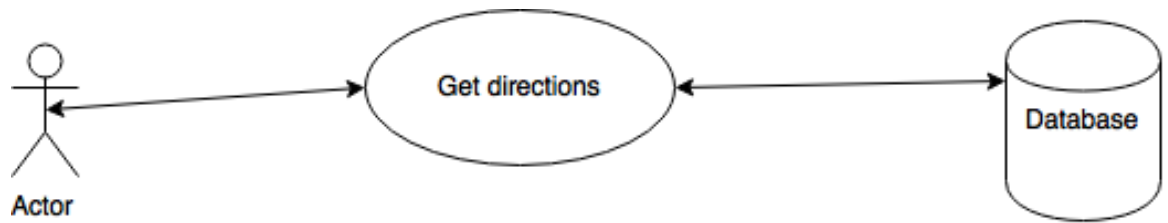
Scope

The scope of this use case is to provide user with direction to barbershop

Description

This use case describes the google maps API route function

Use Case Diagram



Flow Description

Precondition

The User is on the menu page

Activation

This use case starts when the click on 'get directions'

Main flow

1. The System loads google maps on screen.
2. The System takes users location by means of request and takes barbershops coordinate to calculate route.
3. The System display the route to the user.

Alternate flow

A1: User has given location permission

4. The System cannot get users location.
5. The System notifies the User.
6. The User proceeds to enable geolocation permission
7. The System resumes from Main flow step 2.

Termination

The Use case is terminated when the user goes to another page.

2.2.6 Requirement 6: Review/Rate Barbershop

2.2.6.1 Description & Priority

The system allows the user to Rate/review barbershops

2.2.6.2 Use Case

Scope

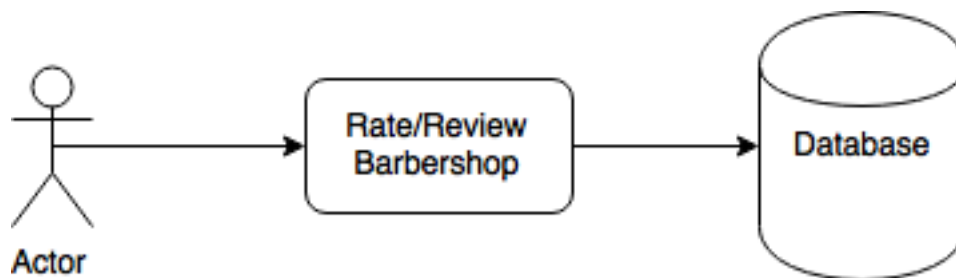
The scope of this use case is to review and rate barbershops

Description

This use case describes the review and rating of barbershops

Use Case Diagram

Diagram should highlight actors and uses cases.....



Flow Description

Precondition

The System is idle

Activation

This use case starts when the click on 'Rate barbershop'

Main flow

1. The User select a barbershop.
2. The User is given the option to rate the barbershop out of 5.
3. The User gives the barbershop a rating.
4. The system invokes the rating function.

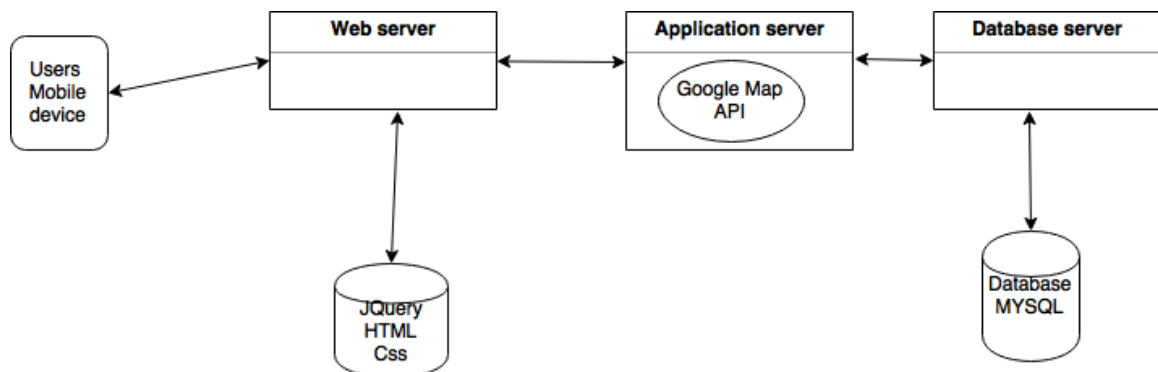
Termination

The Use case is terminated when the user leaves page.

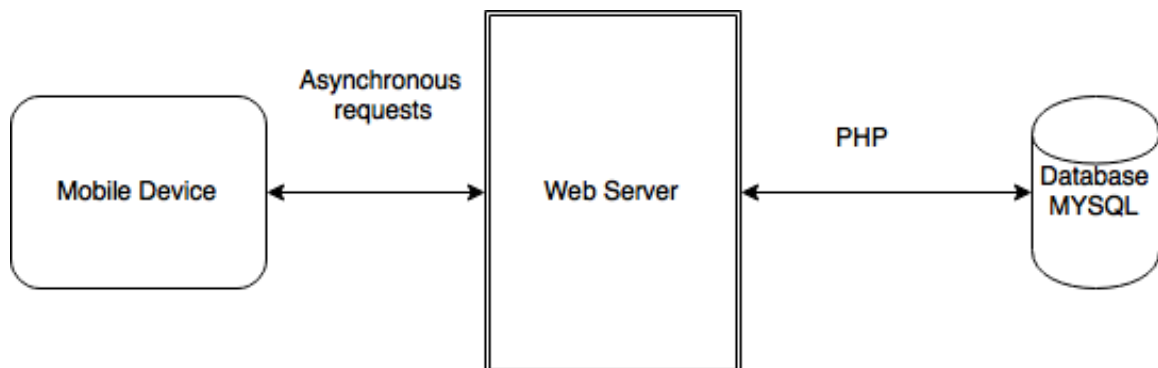
2.2.7 System Architecture

The system architecture is quite straight forward and easy to understand

The application is run on the native device which has and then it communicated with the application server and and Application program interface, Google maps API. Asynchronous calls are made to the back-end scripts and server, which holds the MYQSL database used in the application. Below is the system Hardware and Software architecture.

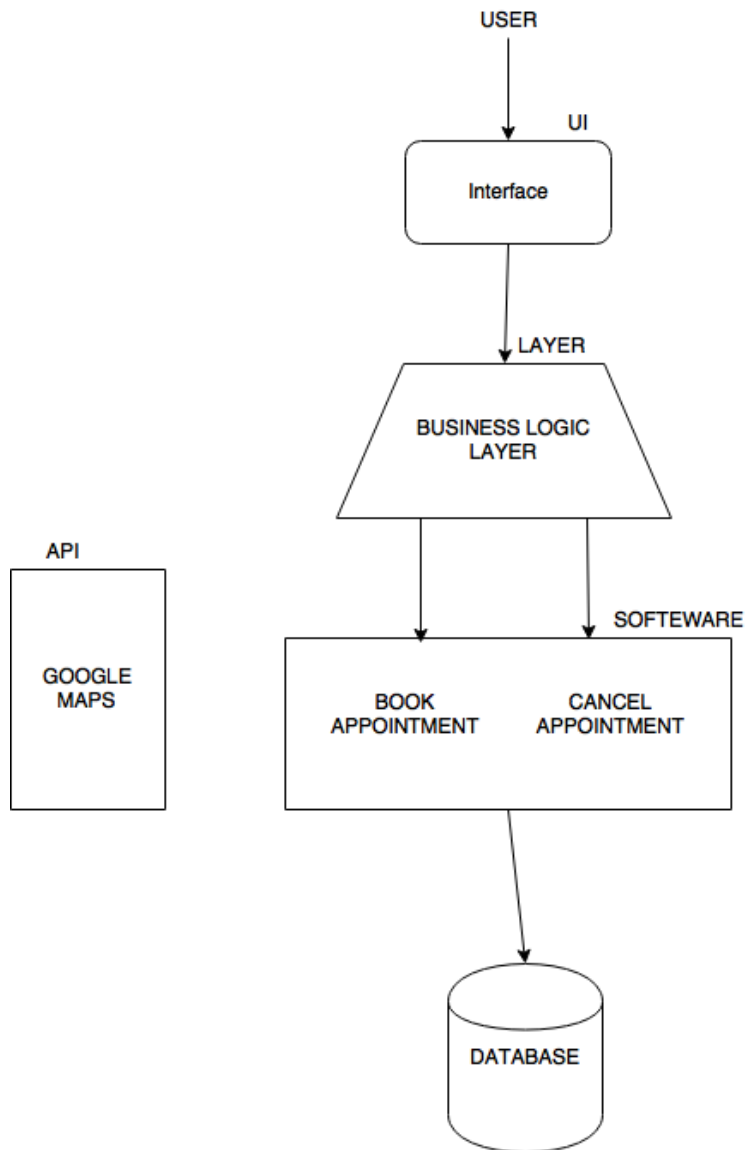


2.2.8 Hardware Architecture



2.2.9 Software Architecture

Software architecture outlines the process of the Application from a software perspective.



2.3 Implementation

In this section I will be outlining the technologies I used in the implementation of the application. Below the technologies will be described as well as coded references to the main functions and classes of the application.

2.3.1 Technology Overview

JQuery Mobile with HTML5 and CSS is used as the front-end design. JQuery and JavaScript is used for various function that will be outlined below. PHP was used to communicate with the MYSQL database. Google maps API was used to provide the user with directions to the barbershop. Ajax was used to make asynchronous calls to the PHP files which accessed MYSQL queries.

2.3.2 Technologies

2.3.2.1 JQuery Mobile

JQuery Mobile is a HTML5 based framework, designed to make mobile responsive websites and application. These application will be accessible on all smartphones, desktops and tablet devices. Instead of writing exclusive applications for each OS and mobile device, JQuery enables you to design responsive web application that works on all popular tablets, smartphones and desktop platforms. I used JQuery because of its cross-platform and cross device capabilities, and it was easy for me to learn. JQuery is also well documented. Its website provided detailed documentation and tutorials to help me with the GUI development. I used JQuery to build the User interface of my application, making it attractive to potential users. Thanks to JQuery's large library I was able to perform a host of functions in comparison to additional JavaScript libraries.

2.3.2.2 JavaScript/JQuery

JQuery is an efficient and feature-filled JavaScript library. It helps to simplify processes such as, event handling and Html document manipulation. Benefits of using was that it JQuery helped me to improve the performance of my application, I didn't need to learn any new syntaxes, because I already knew

JavaScript. In my application I used JQuery in conjunction with Ajax to make asynchronous calls to the server side script PHP which accessed MYSQL database. I also used JQuery to make sure that the functionalities that were to be performed would initiate the loading of the User Interface via document. Ready ().

2.3.2.3 Ajax

Ajax which stands for Asynchronous JavaScript and XML is a client-side script that communicates with a server/database through requests such as GET and POST. Its also used to dynamically update parts of a web page without the need to refresh the page. The benefits Ajax provided to my application was that it reduced travels between the server and client, its response time is faster so this helped to increase the speed and performance of my application. In my Application Phonegap was used to wrap my application in a native shell making it a downloadable application to android, iOS and windows devices. I used PhoneGap and in my application but there was an issue. Phonegap does not support PHP files so I couldn't access the PHP files and MYSQL database . Ajax helped me to communicate with my PHP files and database which were hosted on an online server via its asynchronous calls.

2.3.2.4 PHP

PHP is a server-side scripting language, it is widely used for making dynamic and interactive web sites. PHP is free, and Is used widely. It stands as a capable alternative to Microsoft ASP. PHP is extremely widespread and it is used by major social network company, Facebook. PHP is simple to learn and easy to understand. Prior to my application, I have used PHP in the past and found it very easy for me to use and understand. PHP is also open source and can it isn't OS specific. PHP runs on Linux, Max OSX, Windows and UNIX. For the purpose of my application, I used PHP in conjunction with MYQSL to various perform SQL queries and output the result by echoing JSON encode data.

2.3.2.5 *MYSQL*

In terms of databases, MYSQL is one of the most popular relational database management systems in the world, It uses Structured Query Language (SQL) to query the database. These queries is what is known as Create, Read, Update, Delete (CRUD) operations. MYSQL is easy to use and setting up is fairly easy to use, and also the database is easy to work with. I've also use MYSQL databases in the past, and for the purpose of my application it suited it very well. In my application I used MYSQL to store information concerning the user, which include their ID, username, email, and password. It also stores all the information concerning the Barbershops and it also holds all information concerning bookings being made. This information is used through the application and the database is constantly being accessed. During the course of the project I had no issues with MYSQL and it worked as intended.

2.3.2.6 *PHONEGAP*

PhoneGap which is also known as Apache Cordova, is a development framework for mobile applications. It is used to build cross-platform mobile apps Using web technologies such as HTML, CSS, JavaScript. PhoneGap is open source which means I could make my applications on various mobile OS at no cost at all. PhoneGap allowed me to write my application using HTML CSS and JavaScript and install it to mobile devices without losing the features of a native app. PhoneGap uses plugin to access the Natives application features, these features include camera, contacts, splash screen, geolocation and a host of other features. The only limiting factor I found was that PhoneGap couldn't process languages such as PHP, Java, .NET, ASP and JSF. In my application I used PHP to communicate with my MYSQL database. The solution to my problem was AJAX. Through AJAX I could access the server-side PHP files which enabled access to MYSQL database.

2.3.2.7 PHONEGAP Desktop and Mobile App

PhoneGap Desktop and Mobile App served as testing tools for my project. Using the application, I was able to very quickly get a real version of my application on android and iPhone. The application showed how my application would look like on the android and iPhone. PhoneGap developer allowed me to test how my application looks on the android and IOS platform without having to go through the CLI functionality. To use it, I download The PhoneGap Desktop Application and build my application on my desktop. I deploy my application to PHONEGAP Desktop application, this creates my application and hosts it on a server. To access the application on my mobile device I download the PhoneGap mobile developer application from google play store for android and Apple App store for IOS devices. When I open the application on the mobile device I just type in the server number being presented on the PhoneGap Desktop and my application loads on my phone, showing how it looks on the native device.

2.3.2.8 Google Map API

I used Google maps API to give the user directions to the barbershops they need, it takes the users location and marks the end destination by taking the latitude and longitude values of the barbershop and routes the direction. The result is displayed to the user, giving them clear directions on where to go and a visual map representation of where they are going.

2.3.2.9 GitHub

Github is a repository hosting service based on the web. I hosted my project files on my account. It was used as a backup service so that if by any chance I lost my program files I could get it from Github. I also used Github to deploy my application to PhoneGap build. Using Github enabled me to update my code and gave me the ability to upload new and updated version of my application. Github is also host to a wide variety of 3rd party plugin for PhoneGap to access native features.

2.3.2.10 Photoshop

Photoshop is a software developed by Adobe to create and edit images. In my phone I used Photoshop to design and build the logo for my application as well as the application icon.



2.3.3 Procedures

2.3.3.1 Logging the user in.

This is a description of the login process. The system User interface takes the username and password and once the user clicks on the login button, the system first checks if the fields are not empty. If the field is empty, the system will notify the user. If not the user's credentials are passed to the server-side for validating via Ajax asynchronous call. The user's provided data is sent and the system checks if it matches the credentials in the database. If It matches the database returns a number row count of 1 and the user is logged in. Upon login succession a session is started using the user's ID. This will be used through out the application until the user is logged out. If the database returns a number row value of 0, that tells us that the users information has no record in the database, hence the user cannot log in. The user's credentials are passed via asynchronous to the server using Ajax. Below first shows the Ajax call passing the users credentials and the PHP script that logs the user in.

```

$.post('http://gycs.site88.net/login.php',{username:username,password:password
},

function(data)

{

    if(data ==1){

        window.location.replace("homepage.html");

    } else if (data ==0){

        alert("Incorrect Password Combo");

    }

}

);

} return false;

});

```

```

$query = "SELECT `id` FROM `users` WHERE `username`
='".mysql_real_escape_string($username)."' AND `password` =
='".mysql_real_escape_string($password_hash)."'";

$login=mysql_num_rows(mysql_query($query));

if($login==1)

{

    $user_id = mysql_result(mysql_query($query), 0, 'id');

    $_SESSION['user_id']= $user_id;

    echo 1 ;

```

```

        } else {
            echo 0 ;
        }
    }
?>

```

The concept of the login is very similar to registration. With registration the user just fills in the provided field and once the user clicks on 'register', their credentials are checked to see if the data provided is already in the database. Upon validation success, the system creates the user's account and they are redirected to the login page.

2.3.3.2 Locating Barbershop via Location

This is function was probably one of the most challenging for me. When the user clicks "search by location" depending on whether the device location service is turned on, the system takes their coordinates and sends it to the server via Ajax once again. Then PHP invokes the SQL query that finds the nearest shop based on the user's location from a 5 km radius. The result is echoed by to the client side in a JSON encoded format. The client side uses getJSON function to get the JSON encoded result, this result is then iterated through and appended to a <ui> list in the client side. Below show snippets of the get location function then the sendLocation() function, followed by the PHP script with the SQL query to find the barbershops.

```

$("#locate").click(function() {
    if (navigator.geolocation) {
        navigator.geolocation.getCurrentPosition(sendLocation);
    } else {
        alert("please make sure location is on on your device");
    }
}

```

```

});

function sendLocation(position) {

    var latitude = position.coords.latitude;

    var longitude = position.coords.longitude;

    $.ajax({

        type:'POST',

        url:'http://gycs.site88.net/main.php',

        data:'latitude='+latitude+'&longitude='+longitude,

        success:function(msg){

            if(msg){

                window.location.replace("shops.html");

            } else { alert("sorry there are no barbershops near you"); }

        }

    });

}

$sql = "SELECT `name`, `address`, `link`, ( 6371 * acos( cos( radians(" . $lat. " ) )
* cos( radians( lat ) ) * cos( radians( lng ) - radians(" . $long. " ) ) + sin(
radians(" . $lat. " ) * sin( radians( lat ) ) ) ) AS distance FROM `shops` HAVING
distance < 5";

```

To search for barbershops via city, the user inputs what city they are in and the process that takes place is very similar to the login process. The city specified will be checked against the database, and any records that match the city, will be echoed out to the user in JSON encoded format.

2.3.3.3 Menu page

The menu page was a combination of data transfer. When the user selected the desired barbershop (Shop.html), the barbershops name and address and link was passed via the URL, the link is then sent to the server-side which matches the record to the menu of the barbershop. The menu details are then being pulled from the database and then passed by to the client for the user to see. I had some trouble with this section because even though the documentReady function() was in place the HTML and CSS loaded before the data and I would need to refresh the page to see the data appear. I later found out that it was JQuery mobile's framework causing it. When passing the name address and link in anchor tags I had to specify "data-Ajax= 'false'" for the data to be sent immediately, because JQuery mobile loads the data dynamically. Below are snippets of get URL function which gets the variables passed from the shops page, and the code that appends the menu to html values.

```
var name = decodeURI(getUrlVars()["name"]);  
  
var address = decodeURI(getUrlVars()["address"]);  
  
var link = decodeURI(getUrlVars()["link"]);
```

Below shows how I appended the results from the database to the html mark up.

```
$("#list2").append("<li><a  
href='book.html?service="+service+"&duration="+duration+"&price="+price+"  
data-ajax='false'>They offer: "+service+" <br> Duration: "+duration+" <br> And  
price: $" + price + "</a></li><br>");
```

2.3.3.4 Google Maps API Route

The google map API was used to give users direction to the selected barbershop. Once the user selects a barbershop, they are given the option of viewing it on a map which not only displays a visual representation of the route but it, also give clear cut direction from a driving perspective. I used Google maps

to get the users location and then pull the latitude and longitude values of the selected barbershop and set them as the destination. Google maps calculate route function was used to calculate the route and display the directions under the rendered map. Implementation of this took a lot of trial and error. In order for me to get it to function, I once again had to use “data-Ajax= ‘false’” when linking the user to the map. The map wouldn’t load if I simply didn’t specify “data-Ajax= ‘false’” in the anchor tag. That was probably the only major drawback I had from using jQuery Mobile while building my application. Below is the calculate route function.

```
function calculateRoute() {  
    var targetDestination = new google.maps.LatLng(destinationLatitude,  
destinationLongitude);  
  
    if (currentPosition != "" && targetDestination != "") {  
        var request = {  
            origin: currentPosition,  
            destination: targetDestination,  
            travelMode: google.maps.DirectionsTravelMode["DRIVING"]  
        };  
        directionsService.route(request, function(response, status) {  
            if (status == google.maps.DirectionsStatus.OK) {  
  
directionsDisplay.setPanel(document.getElementById("directions"));  
                directionsDisplay.setDirections(response);  
                $("#results").show();  
            }  
            else {
```

```
        $("#results").hide();  
    }  
    });  
}  
else {  
    $("#results").hide();  
}  
}
```

2.4 Testing

Below are the different test techniques and tools I used to test my application, making sure it passed the required tests.

2.4.1 Unit Testing

Throughout the development cycle of the application, unit testing was applied extensively. I used both android and IOS devices to perform Unit testing to see if each functionality in the application worked as designed. Via the mobile devices, Unit testing was applied in login and registration process, to ensure that the validation and authentication worked flawlessly. Unit testing was used to test the geolocation feature for searching for barbershops.

Unit testing was performed on Ajax asynchronous calls to PHP and MYSQL to ensure that they performed as expected and that the correct output was sent to the client.

Unit testing was performed on the Google Maps API to see how the map would work on cross platform OS devices and if the directions would be displayed as designed.

2.4.2 Cross platform testing

I tested how the application worked on different platforms, Android and IOS. I used PhoneGap's developer app to quickly deploy my application to both android and IOS. Using the PhoneGap developer application I could see how the application performed and looked on the respective devices. This gave me the ability to see the application on different platforms so that I could make any changes that needed to be made to ensure the application was running smoothly on each platform.

2.4.3 Security Testing

Security testing is a critical testing phase of the Application. The accountability of the application is measured by how secure the application is. I tested the application by trying to log in with invalid credentials and registering with data that is already in the database record. I used an application called Grabber to find security faults in my application files. Grabber is an online web based application scanner which scans the application for any security vulnerabilities. The program tell you where the vulnerabilities in your files. The application can detects security issues such as SQL injection Ajax testing File inclusion, JavaScript source code analyser. The application enabled me to ensure that my application was secure so that the user can have confidence in my application when using it.

2.4.4 Usability Testing

Efficient Usability testing can leads to a decrease in support costs, it helps to save time with development and avoid redesigning. Effective usability testing results in increased user satisfaction and improve user experience which can give an application the edge over other competitors. In my application I carried out usability testing by allowing potential users to use and navigate through my application. Majority gave good feedback and expressed that they liked how simple it was to use and navigate through.

After this I performed what is known as a “think aloud” test. A think aloud test whereby I watched how a user used my application to further any developments that needed to be made. I gave the user a scenario and a task then sat down and let the user work through the application. The task was, “You are in Saggart which is unfamiliar to you, you have only 8 euros, and you want to get a haircut later this evening at 4:30pm , and you want to know how to get there”. I then observed how the user used my application. I was very happy with the results. The user didn’t need to ask me how to do anything, and the whole process took him 4 minutes, taking into account that he had to select barbershop and compare prices. The user expressed their satisfaction with the appealing google maps API route feature. He also suggested finding barbershop based on haircut prices which I had really thought of, and will be implementing in the future. The think aloud test really gave me a real world example of how potential users can use my application. For the think aloud test I used a free screen recorder application on the android market called “Rec” to record the users interaction with the application for further review. I believe the Think aloud testing serves as a great tool for customer testing.

2.5 Graphical User Interface (GUI) Layout

Login Page.

●●○○ 48 03:43 Get Your Cut! 23%

Username:

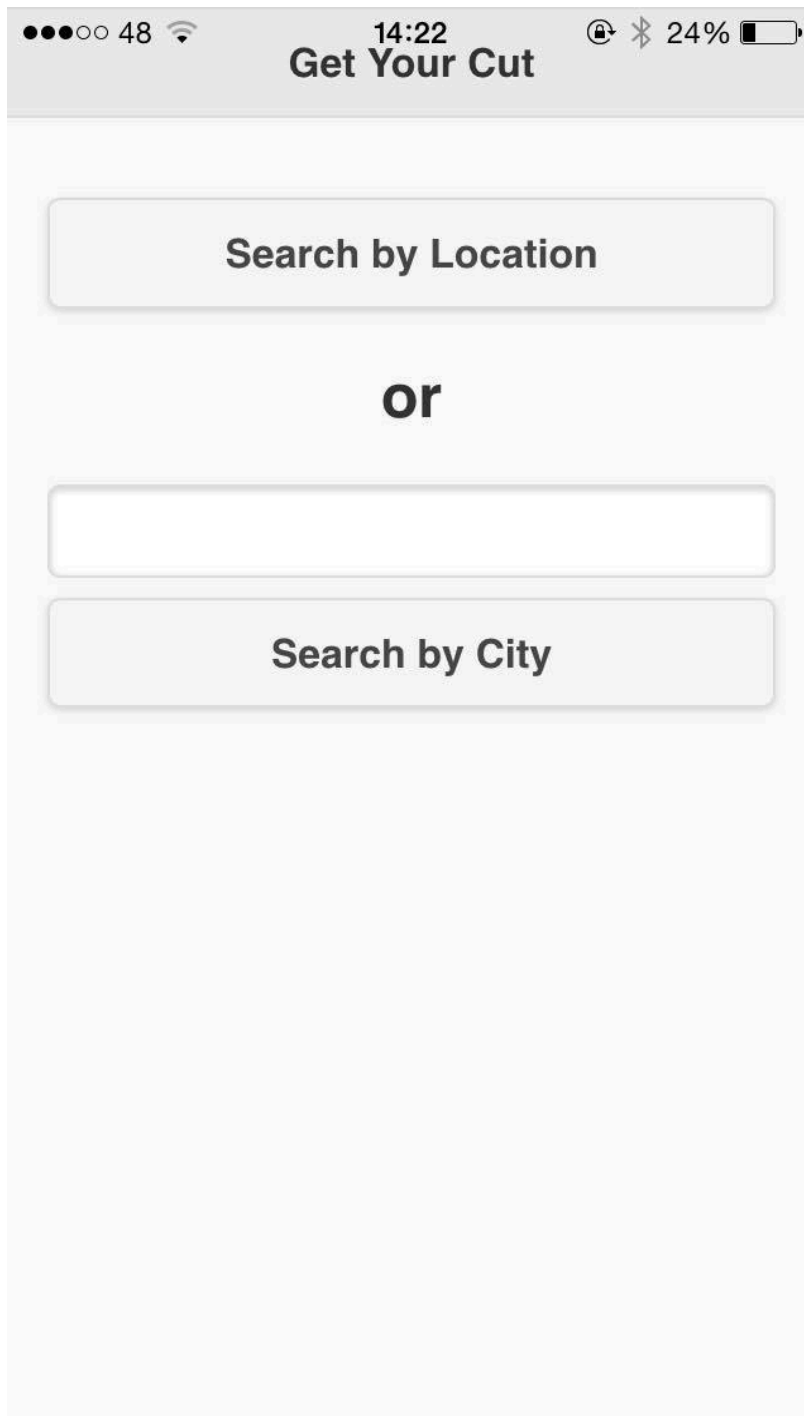
Password:

Log In




Don't have an account?

Register


Below is the page to select how you want to view the barbershop




Below is the route and directions to a barbershop.

●○○○○ 48  03:54  14% 

Map Satellite




Google Map data ©2016 Google Terms of Use

 58 Millrace Park, Saggart, Co. Dublin, Ireland

2.8 km. About 5 mins

1. Head northwest on Millrace Park41 m

 2. Turn right to stay on0.1 km

2.6 Customer testing

For customer testing I performed Persona testing. This test involves getting willing volunteers to come and use the application and provide feedback on their experience whether it be positive or negative.

Dammy(23): Dammy is a master students and specialized in entrepreneurship. He liked the concept and thought it would revive barbershops who barely get customers. He especially like the google maps Direction features as it take away the task of finding the barbershop by their own means. He said there is definitely a market for such technologies.

Michael(19): Michael is an iPhone user and technology enthusiast. He also liked the concept o the application and the services it provided. He said although he probably won't change barbershop and the application wont be that useful to him, he admitted that it would suit people who aren't too picky with their barbers and and visiting or new in their area.

James(26): James is a student and is a smartphone user. He said really liked the application. He felt the google maps route would help customers get to the shops. He said he would use it the application and that barbershops can attract more people by promoting the application and offering discounts since most barbershops are really online.

Conclusions

The Get Your Cut technical report outlines all the steps it took in the creation of the application.

Overall I enjoyed the development of the this project. It pushed me further than I thought it would and I have gained an invaluable experience from it. This project enabled me to go through the entire development cycle. From the project scope, purpose and the application's aim , through the Functional requirements and Non functional requirements, Data requirements, User Requirements, Environmental requirements, Usability Requirements, Design and Architecture, Implementation, Testing and GUI development. This project has given me the confidence to tackle future projects that I will be undergoing later in my career.

3 Further development or research

With more resources, where could the results of this project lead to?

With further research and development I believe Get your Cut can thoroughly become the number one go-to application for booking barbershop appointments. I hope to add more features to the application such as the ability to see which barbers they have and to select which barber they want for their hair appointment. I will also want to implement a notification feature, either through the application or the native device to notify the user once the time for their appointment draws near. I would also want to make the application accessible to people with special needs by applying text to speech functionality to the application.

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3.2 Project Proposal

Project Proposal

Get your cut

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BSc (Hons) in Computing

Specialisation (Networking and Mobile Technologies)

Date 30/09/2015

3.2.1 Objectives

Summary:

Get your cut is a web application that allows customers to book haircuts online making the problem of queues a problem of the past. You get a list of nearby barbershops to book haircuts from all from the luxury of your portable device.

Search results: The application will give you a list of nearby barbershop to select from depending on your location.

Bookings process: The application will enable you to book haircuts by selecting a date and time.

Review system: The application will enable the customer to give a review of the barbershop by giving them a rating.

User Experience/Interaction: The applications UI design will be built by HTML JQuery mobile, which is a mobile first responsive driven design framework. The framework will be applicable to all mobile devices. The UI will be very user friendly making it a satisfactory experience for the user/customer.

3.2.2 Background

The idea came about from my own experiences at barbershops. I would go to a barbershop and would have to wait almost an hour at peak times. I used to dread going to the barbershop anticipating the long queues. I noticed the this was a very prominent issue so I sought a solution.

I wanted to create a platform whereby the user can book haircuts, eliminating the issue of standing waiting in queues. It also enables the barbershop to establish an online presence which can bring in more customers to the business.

I also saw that there is a niche in the market for this application.

3.2.3 Technical Approach

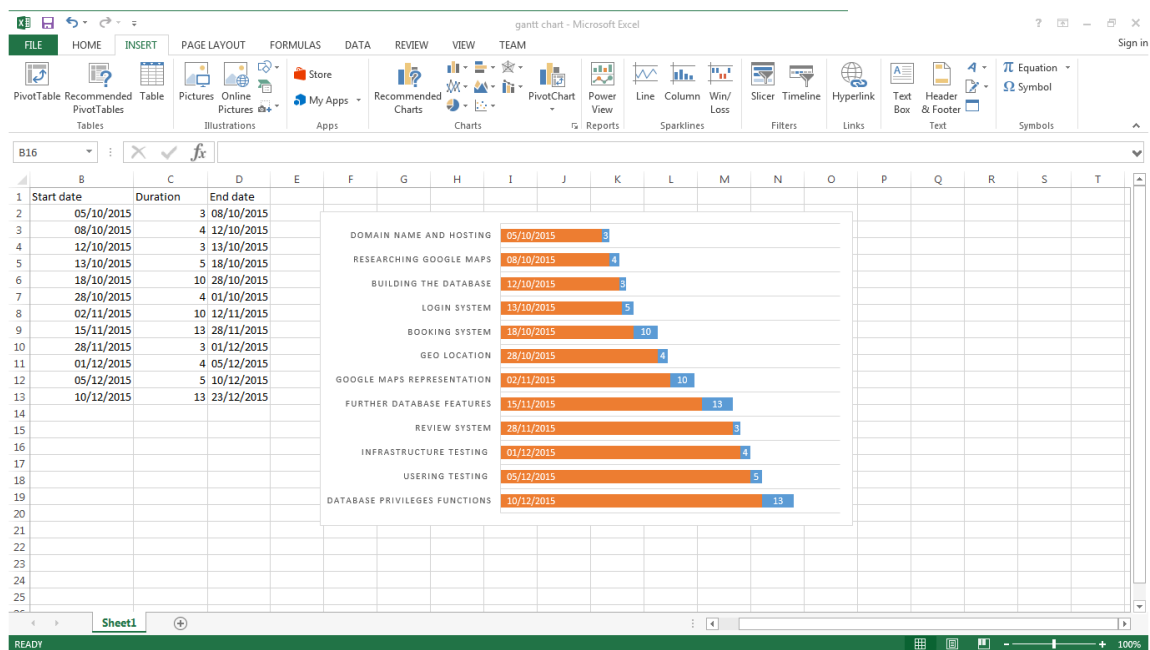
It will be a Hybrid application

3.2.4 Special resources required

Main resource would be Online tutorials.

3.2.5 Project Plan

Gantt chart using Microsoft Project with details on implementation steps and timelines



3.2.6 Project Plan

Gantt chart using Microsoft Project with details on implementation steps and timelines

3.2.7 Technical Details

PHP –PHP serves as the main scripting language for my application. This will be used for writing to the database, pulling information from the database also for the booking system and also querying the database.

HTML5 & CSS – I will be using HTML5 and CSS in conjunction with JQuery mobile to help with the User Interface.

JavaScript – This will be used for interactivity such as the map itself and for creating a cleaner, smoother UI.

PhoneGap: I will be using phoneGap to enable my application to be cross platform hybrid application.

MySQL – I will be using MYSQL queries for the database in conjunction with PHP

Google Maps API – This will be used for the map and geo location of the various barber shops and routing directions to the barbershop.

JQuery Mobile – JQuery mobile will be used to build the mobile driven, responsive front-end UI of the application.

3.2.8 Evaluation

I will be performing various tests on my application, both during and upon completion. Black box testing will be used for testing the functionality of the Application. White box testing will be used for testing the internal structure of the application. I will also have users use the application to test for any errors or problems from a UI and ease of use point of view.

____OlaDimeji Adekanmbi 30/09/2015____

Signature of student and date

3.3 *Application Programming Interfaces (API)*

Google Maps:

The API being used is Google Maps API. It will be used to get the users location and perform queries based on their location. My system uses google maps to locate the barbershops and also to give directions to the barbershop.

4 System Evolution

Over this system can grow to be best application for barbershop appointment, its cross platform allows all smartphone to have access to the application. The feedback I have gotten from people who have use the system were quite positive.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: September

My Achievements:

This month was about brain storming to find an idea for the final year project. The lecturer gave us examples of past project to help us find inspiration for our own project.

My reflection

This month was just about finding the idea. I hope I find one that I can it very suitable to my module stream (mobile.)

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: October

My Achievements

This month was all about researching. Researching what I need to make my application for e.g. Html and CSS for my user interface PHP as my scripting language, MySQL as database etc. I decided to select Bootstrap as my front end framework as it is very mobile friendly and there is a lot of documentation on it which means I can find what ever resources I need from it.

My reflection

From my researching I've found that my application can be done in PHP, bootstrap, MySQL and Google map API.

Intended Changes

In the next coming weeks, I hoping to start going through some tutorials in PHP, bootstrap, MySQL and Google API.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: November

My Achievements

This month, I was able to get to grips with the technologies I will be using. With the aid of plural sight, I was able to undergo a series of tutorials to get well accustomed to the technologies I will be using such as PHP, MYSQL, Bootstrap. I have made significant progress with my requirement specification document and I have made a start on my Analysis and design document. It took me some time to find the functionality of the distance query functions of the google API.

Project Contribution:

Doing up my Requirement specification: filled out the requirement specification document for my project, its still an on going progress as I continue working through it with my supervisor

Starting my Analysis and designs document: Document that describes the structure and architecture of the project

Creating and connecting database: Using phpMyadmin PHP and MYSQL, successfully created a database and connected it to my application to carry out data queries.

Login/registration page: I made the login and registration page for my project application.

My reflection

I felt, it would have worked well to set short goal ranging from a few days to a week max. It would have kept me constantly working and improving. I would work on my project one day and not touch for a whole week

Intended Changes

Next month, I will try to set more short term goal to keep me consistently working on my project. For the next month hope to have the google maps API fully integrated with my application. I also hope to be making a start on the booking aspects of the application as it is an integral part of the project. I want to take advantage of the next month as college will be closing and I would have more time to work on the project. I hope to make significant progress for the end of the next month.

Date of Meeting: 28th November 2015

Items discussed: Requirement specification

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: December

My Achievements

This month I have made significant progress with my Analysis document. I'm also still trying to get to grips with the Google API Latitude and Longitude values. I'm trying to incorporate it with my project.

Project Contribution:

Updating My requirement specification.

Finishing my Analysis and designs document for the upload (Document that describes the structure and architecture of the project)

Working on some bootstrap designs.

My Reflection

My original intention was to fully have the google API fully functioning in my application but its taking longer than I anticipated.

Intended Changes:

Next month, I will try to make as much progress with the Google API. I cannot fully say where ill be by next month due to exams coming and most of my focus will be on the upcoming exams till mid January.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: January

My Achievements:

This month I updated my Requirement specification document and Analysis and Design document. I started working on my technical report. And lastly I made presentation slides for my upcoming presentation with helpful tips from my supervisor.

Project contribution:

Created PowerPoint presentation for mid point presentation.

Started working on Technical report.

Updated Requirement specification document.

Updated Analysis and design document.

My Reflection:

I haven't done much in respect to the building of the application as much as I wanted. The exam period really made me drift from it for a while.

Intended Changes

Next month, I hope to pick up the pace and get my application into its beta version as soon as possible.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: February

My Achievements

I've been working on the project more often setting about 2-3 hours to week to focus on it. I have gotten the search by location functionality finally working. My supervisor gave me the idea of searching by city as another option seeing that not all user will want to give away their location and I currently working on it. I've also updated my technical report, I found out during the presentation that the requirement spec is not suppose to be in the technical report as a separate file, but rather it should be the basis of filing out my technical report.

Project contribution:

Finished Search by Location feature.

Started working on Search by City feature.

Updated technical report.

My Reflection:

There's a lot to be done but I am happy with the steady progress I am making. I feel like I've started making real progress as my application is now taking shape. My supervisor is always keeping record of how I'm doing and that is greatly beneficial for me.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: March

My Achievements

I made the barbershops menu page, this contains the name, address, rating and also the menu they offer. I have also made some User interface alterations after doing some customer testing by asking fellow colleagues and the barbershop I go to in Tallaght. I decided to make JQuery mobile my front end framework so the application can be a mobile first design. I decided to make my web application to a hybrid application using PhoneGap to wrap the application in a native shell. I have discussed these changes with my supervisor and he has given me the go ahead. but for safety measures, the supervisor told me to be careful and to have the bootstrap framework just incase I run into problems. My Technical report is also being updated as I continue with the project and make changes.

Project contribution:

Updated technical report.

Created the menu page for barbershop.

Made changes to User interface framework and design.

My Reflections

I have made steady progress thus far, but I know I won't be able to really work on the project that much in the next coming weeks as my final exams are fast approaching, commencing on the 11th of next month. I also have some CA projects and deadlines to meet. I will still try and keep working on it through the hectic period.

Intended Changes

Next, month my goal is to have all functional requirements of my application running and working on the technical report to meet the deadlines comfortably.

Reflective Journal

Student name: Oladimeji Adekanmbi

Programme: BSc in Computing

Month: April

My achievements

I have nearly finished with my project, The technical report is 80% done, just need to clean it up and make it presentable to the examiners. I have made my showcase poster and it will be printed closer to the hand in date.

My Reflection

This project has been a rollercoaster, even though its not over yet. It has really thought me the importance of time management and diligence. I have enjoyed this experience. The past two semester have flown by and in the next few weeks ill be finished and have my degree gotten. I thank all the staffs and lecturers and especially my supervisor for the effort and time put in to make my project a success.

Intended changes

Next month, I hope to meet all my deadlines, submit my completed technical report, submit the project code with the project presentation slides, have a mock presentation with my supervisor before I have my final year presentation. Then I prepare to do the project showcase and after, thank God for helping me get a Degree in BSc Hons in Computing.