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Task 1

Critically evaluate the function and advantages of web applications. [1.1, M1]

Introduction

World Wide Web (WWW) is innovation that permits clients to get to report from web servers through internet. These archives are known as pages. A website page for the most part comprises of pictures, writings, hyperlinks, structure components, and menus and so on. A site is gathering of related site pages that falls under same web map. With the consistent improvement it web innovations, idea of outline additionally continues updating. The key idea of web outline is to give rich UI as well as related and fulfilling substance in the site page. Spaanem (2013) suggests, based on the function of websites, they are categorized into static website and dynamic websites. Static websites are simply used for delivering information about individual/organization to their clients and consists of series of HTML pages where as in dynamic website (web application) client side page is built dynamically when a client visits website. This paper critically evaluates functions web applications and their advantages.

Web Application

LMU (n.d.) defines Web application as a software that run on computer with web server support. To access web application, client requires web browser or similar web tools. Unlike native programs, web programs does not require to distribute software package for installation in client computers. Some of the things that can be achieved through web application but not possible via static website are:

1. Authenticate and authorize user
2. Collect user information to perform accordingly and store information in database
3. Allows to perform tasks such as transaction, submit feedback forms, online surveys, retrieve information from database etc.

Web application permits its clients to execute business rationale that lives on a server and to see the consequences of that rationale through a web program on a customer workstation. Present day websites permit the storing, handling, catch and transmission of delicate client information (e.g., personal data, credit card data) for prompt and intermittent use. This is basically done through web application. Such components as login pages, webmail, content administration frameworks and shopping carts are utilized in web application to satisfy business requirements. These are all regular

illustrations of web applications. Some example of web applications are ecommerce sites, news portals, web based management information system, personal blogs, online surveys etc.

Working of Web Application

According to ACUNETIX (n.d.) web application function in three-tier architecture layer model. Layer one is user interface (usually web browser) that request services. In layer two, dynamic content generator such as PHP, ASP, and JSP resides. And finally third layer being database that stores contents that is utilized while rendering page for client. Database is utilized for storing user information such as username, password, email address and other details. Figure 1 demonstrates fundamental functional structure for web application.

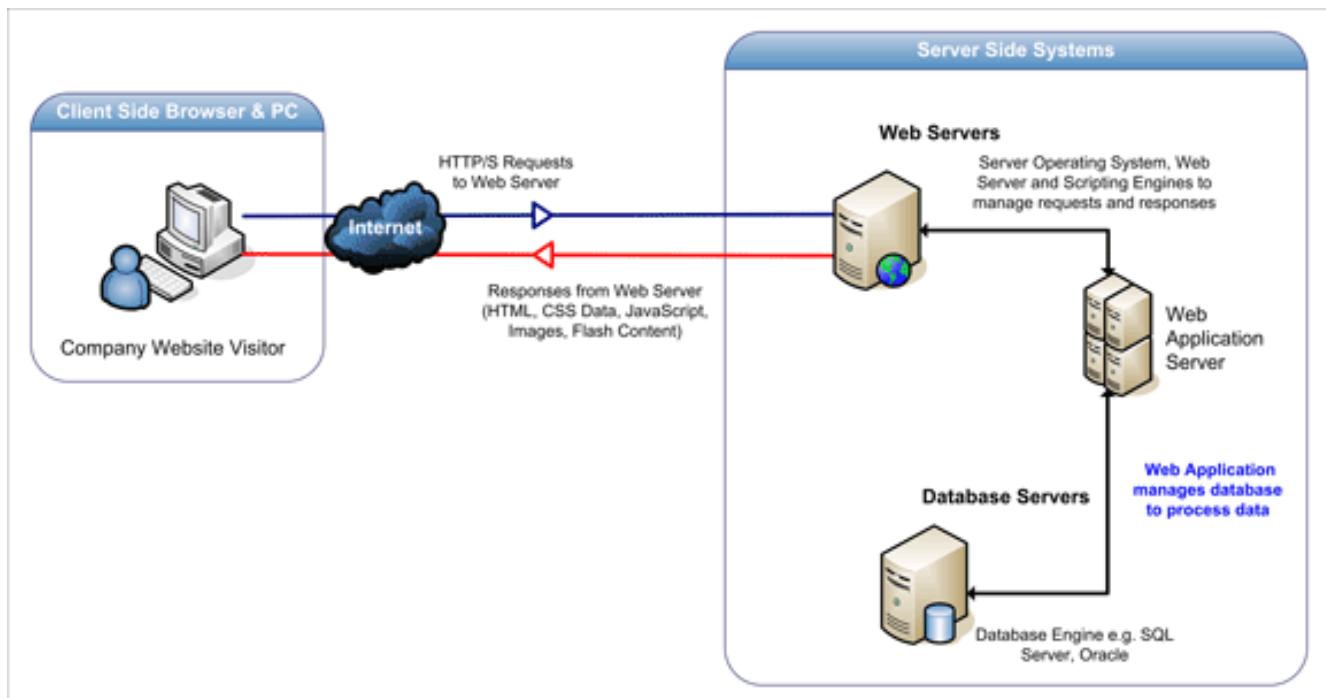


Figure 1 Working Functionality of Web application (Source <http://www.acunetix.com/>)

Advantages of Web Application

Cost effective

One of the key advantage of web application over native desktop application are the lower requirement on the end user side. It is observed that cost on testing and maintenance in web application development can be much cost effective than that of desktop application. And finally, one of the major cost benefits of web application is it does not depends on platform. If you have more than one platform, client does not require to have different version of web application for each platform. Which helps to reduce operational cost. Similarly, while testing developer does not require to worry about platform.

Accessible anywhere

Sutton (2015) highlights the benefit of web application that it is immediate and does not require installation or download. This helps client/user avoiding downloading installing application package. As web applications are cross platform and high manageability deployment is easier. User will internet access and any modern browser would be able to access the application.

Cross platform

According to DBNETSOLUTIONS (n.d.) web applications are significantly more platform independent and does not rely on hardware configuration and operating system. As most of the web applications operates on web browsers, user only require compatible browse. If a web application functions correctly on Mozilla then it will run on Mozilla anywhere, it does not matter if browser is installed in windows or android or Mac or any other platform. It offers great flexibility developers while testing the system and users while operating the system.

Improved interoperability

With web application, interoperability can be far more easily explored than with native application. Making two different proprietary system understand each other is significantly harder in desktop application. Windows application allows developer to take advantage of interoperability to achieve business requirements. For example, an e-commerce website can easily integrate with web bases accounting services.

Easier installation and maintenance

As said above, windows application does not require installation from client side. Installation is done only on server side which generates dynamic content for client upon request. MAGICWEBSOLUTIONS (n.d.) notes, web application makes installation and maintenance process less complicated. To apply on the system, only server side is updated unlike desktop programs where each client requires to download and install updates.

Security

Web application offers security as no information is store in client side and system is hosted via server. Generally, hosting servers are handled by expert technicians/engineers who monitors and maintains security. These experts takes care of every security details to ensure application's security.

Limitation in Web Application

Requires Internet

Fox (2015) highlights the disadvantage of web application that it is internet reliance. If user has not access to internet for some reason, he/she will not able to access the system. This means user who depends on web applications for editing images, texts or calculation would require internet connection. But desktop applications which does not require internet connection has many option for performing activities like text editing, calculating etc.

Browser Support

As being platform independent is huge advantage for web application, it also serves as small limitation. As web application allows user to connect to system using any web browser from any platform, users utilizes different browser to access system. This means developer have to make sure program is supported by all web browsers.

Security

Web application offers great security mechanism when server is handled by expert/specialists. But not all web applications are hosted in great third party host servers. Cheaper hosting providers takes less care of security aspect of application or need to buy additional packages for extra security support. Other security concern of web application is if server side has problem all client will be affected.

PHP5

PHP is open source scripting language that is used for web application development and for general programming, Kohan (n.d.). PHP earlier was known as Personal Home Page, now it's also called hypertext preprocessor. PHP is server side scripting language and is HTML embedded. To develop dynamic website/web application PHP statements are embedded together with HTML tags in web pages. These PHP codes are executed in server and processed by PHP interpreter.

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
 "http://www.w3.org/TR/html4/loose.dtd">
<html>
  <head>
    <title>Example</title>
  </head>
  <body>

    <?php
      echo "Hi, I'm a PHP script!";
    ?>

  </body>
</html>
```

In example above, PHP codes are mixed together with html codes. In example above, PHP code will print Hi, I'm a PHP script! In webpage.

What differentiates PHP from something like JavaScript is that the code is executed on the server, creating HTML which is then sent to the customer. The customer would get the consequences of running that script, yet would not comprehend what the fundamental code was. You can even arrange your web server to prepare all your HTML records with PHP, and after that there's truly no chance that clients can tell what source code is really used. PHP can be used for developing desktop application as well but it is not most suitable choice.

According to JAVATPOINT (n.d.) PHP file contains PHP scripts, HMLT tags, CSS, JavaScript, texts etc. and has extension of “.PHP”. After consistent improvement in the language, latest version of PHP is PHP 5. Latest version offers various feature and support that is unavailable in the earlier versions. Various features of PHP are evaluated in later part of this paper. But before that let's discuss some of the major benefits of utilizing PHP scripting language while web developing (implementing dynamic website/web application).

Benefits

- **Free of Cost:** PHP is open source scripting language
- **Platform independent:** PHP scripts can be executed on any major operating system.
- **Easy Hosting:** Finding hosting service is very much easy as most of the hosting provider offers PHP site hosting.
- PHP is very **easy** language to learn and implement
- **Enhanced Security** is offered by PHP as it allows password hashing

Features of Web application with PHP

To evaluate web application function and advantages, this documents evaluates various features of web applications and PHP.

Object-Oriented PHP

PHP has adapted object oriented model from PHP5, KILLERPHP (n.d.). With Object oriented, PHP can assume real world object as programming object and implement system using those objects. Web development can now utilize various features and advantages of OOP. This allows web application with clean and well managed coding structure. Object-Oriented PHP demonstrates following characteristics of object oriented programming while programming web application.

Polymorphism

Polymorphism allows to create methods with same name but with multiple functionality. Object oriented PHP exhibits characteristics that allows creation of method with same name but with different attributes and demonstrates different behavior. According to Alomari (2012) method polymorphism is not possible in PHP due to the fact PHP accepts variables arguments and is not type strict. Though polymorphism is possible in PHP via concept of type hinting.

Inheritance

It is feature of OOP that allows a class to inherit properties and method of another class. BEGINNERSBOOK (n.d.) explains derived class (subclass) utilizes and demonstrates behavior of its base class which is also known as superclass. With inheritance, PHP offers greater code reusability.

Encapsulation

Encapsulation is feature of OOP that allows to hide data and functional member. It is process of information hiding (CODEPROJECT, n.d.). Utilizing keyword protected, public and private programmer can decide what to hide and what is allowed to access. These keywords are known as access specified. Basically public member are accessible from other class, private methods are only accessible from methods of same class and protected keyword allows member accesses from child classes. With encapsulation PHP offers greater security while programming.

```
<?php

class CanadianPet extends Pet
{
    public function setPetName( $newName )
    {
        $this->petName = $this->checkPetName( $newName );
    }
    private function checkPetName( $petNameToCheck )
    {
        return str_replace( 'a', '', $petNameToCheck );
    }
}

?>
```

In example above, if programmer creates object of class and try to access private method of class, he/she will get error, which means access to private segment is not allowed. Which explains encapsulation.

Abstraction

Abstraction provides ability to hide working functional concept and provide only generalized view by showing relevant information. Though it sounds similar to encapsulation, both are different as abstraction solves problem in design level. With abstraction actual work is allowed to access but how that work is being done in background is hidden. Abstraction in outer layout which is utilized while designing program structure.

Error and Exception handling

Error Handling

While exploring features of web application with PHP, error and exception handling is another important feature to be considered. PHP offers great default error handling mechanism as well as exceptional handling mechanism. When error occurs, PHP provides error type, file name and line number in web page. While evaluating error and exception handing lets discuss error handling methods used in PHP.

1. Using Die () method

According to TUTORIALSPOINT (n.d.) with this method, possible error condition is checked before the action and if error occurs appropriate actions is taken. In example below, use of Die () function for error handling is demonstrated. In example, before performing real actions on file first existence of that file is checked, if file is not found, error message is thrown to browser saying file not found. And if file is found required codes are executed and success message is thrown to browser. This method is pretty effective for error handling.

```
<?php
if(!file_exists("/mydirectory/atutgorkhali.txt"))
{
die("File not found");
}
else
{
$file=fopen("/mydirectory/atutgorkhali.txt","r");
print "Opened file sucessfully";
//required codes
}
```

?>

2. Using custom error handling

In this method, custom code is written to handle errors in program. Minimum of two parameters are required in custom error handling function (error level and error message). Example for custom error handling is given below.

```
<?php
    error_reporting( E_ERROR );
    function handleError($errno, $errstr,$error_file,$error_line)
    {
        echo "<b>Error found:</b> [$errno] $errstr - $error_file:$error_line";
        echo "<br />";
        echo "Closing PHP";
        die(); } //set error handler
    set_error_handler("handleError");
    //trigger error
    testFunction();
?>
```

Above example would handle error generated when trying to access function that is not exist and display error message.

Exception Handling

Exceptional handling is used for changing flow of code execution in event of exception error, writes w3schools (n.d.).PHP offers similar exception handling capability to other programming languages java, C++, C# etc. When exception is thrown, it is handled using Try-throw-catch method. Basically it is method of exception handling where three segments try, throw and catch is utilized. Codes to be executed is written inside Try segment. If codes generates exception, exception is thrown. Throw block describes how exception is handled. It must consist of at least one catch. Catch section retrieves error information from throw and takes appropriate action.

```
<?php
function checkNumber($num) {
    if($num>1) {
```

```

        throw new Exception("Number must be 1 or below");
    }

    return true;
}

//trigger exception in a "try" block
try {
    checkNumber(2)
    echo 'If you see this, the number is 1 or below';
}

//catch exception
catch(Exception $e) {
    echo 'Message: ' . $e->getMessage();
}
?>

```

Above example demonstrates exception handling offered in PHP. When above example is executed, it will display error message Number must be 1 or below as stated in throw section. Error and exception handling features of PHP are simple and effective which helps to make this scripting language popular choice for web development.

Session Handlers

Internet demonstrates stateless nature as HTTP does not maintain states hence server does not know about clients. To overcome this, programmers utilize session feature. SITEPOINT (n.d.) explains, session helps to monitor website visit, track user navigation behavior or create shopping cart system. When a client visits web server, new session is created with a unique ID. These IDs are stored in cookies on clients own browser. These sessions are set to expire in certain defined time period to ensure security.

Session Configuration

In PHP, session management is configured with help of php.ini file. session.auto_start flag is set to 1 to automatically start session when user visits web application. Session_start() is used in php script to manually start or continue a new session. Php.ini also allows to define session period, which is 1440 seconds by default. Some of the session related functions in PHP utilized by programmers are as follows:

- **Session_start ()**: Manually sets new session if no session exists
- **Session_unset()**: resets all session variables
- **Session_destroy()**: Close/kills session

```
<?php
session_start();
?>
<!DOCTYPE html>
<html>
<body>

<?php
// remove all session variables
session_unset();

// destroy the session
session_destroy();
?>

</body>
</html>
```

Example above demonstrates start, unset and destroy of session in PHP.

Web Services

Web services are part of web application. According to w3schools (n.d.) these services are published in web and are also found and utilized. Open protocol is used by web services while communicating. Web services are utilized by other applications and HTTP and XML are foundation of Web services. With web services web application reaches next level as it allows to publish and function or message to rest of the world. Web services utilizes XML for coding and decoding data information whereas SOAP is utilized to transport data. There are two major utilization of web services.

- Web services can tackle the interoperability issue by enabling different application to link their data. Different platform and application can exchange their data with help of web services
- It is used as application component services such as weather report component, translation service etc.

PHP utilizes web services to link web application data with android, java, asp.net applications. PHP also utilize web services to get weather service, calculation services from other web applications.

MySQL 5.5

A database system allows to store information. Most of the applications today (web/mobile/desktop) uses RDBMS for storing information. RDBMS stands for Relational database because, different tables are utilized to store information and relationship are developed between tables (TUTORIALSPOINT, n.d.).

MySQL is free and one of the most popular RDBMS that is mostly utilized for storing data for web application. Scripting language such as PHP utilizes MySQL to store information about users, products, news etc. MySQL standard SQL queries and are fast, easy and reliable to use. As MySQL is released under Open source language, developer use MySQL for free which is one of the main reason for its popularity. Just like PHP, MySQL is also going through continuous development and later version MySQL 5.5 is released. It has various improved supports over earlier versions such as better **performance, scalability, availability, usability** etc. Here are some of the advantage of using MySQL with PHP for web development.

Benefits of MySQL

- **Free** to use RDBMS
- Offers flexibility as it support PHP, Java, C, C++, PERL etc.
- MySQL requires small space for installation
- Uses standard SQL and easy to learn

Users

One of the key components while planning web application is client and ease of use. Site is essentially intended for clients henceforth client experience for diverse sorts of clients ought to be mulled over while planning application. Site ought to give clients great experience and data discovering ought to be simple. Clients can be classified into expert, regular, occasional and novice.

Expert

Expert user implies clients with high experience and legitimate information of application and innovation. Noted by Helander et al. (1997), these clients' hates to waste times and tends to utilize

alternate ways to make effective performance. Administrators, technical teams are expert users. They handle critical tasks of the application.

Regular

Regular users are those clients who visit site consistently and has learning of site structure. They have understanding regarding how diverse site pages functions. These users can easily finding items, place them in cart and perform transaction. They trust online shopping and organization with the quality of product.

Occasional

These are not regular users and only use application occasionally. They have small but needed information about application, online shopping process etc. These users seeks additional help from support team if they have any difficulties.

Novice

These users are just curious clients who visits application and has no experience and knowledge about the particular web application. These clients gives attention to small details and required assistance while using the application. These users does not trust the application hence may seek for assurance. To help these users, web application should provide proper guideline, policy guide, video references, etc.

Secure PHP Programming

When developing web application with PHP, there are many components needs to be considered in order to secure application. Basically any application faces security threats but as web applications are open and accessible from anyone, security need to be handled more efficiently. Some of the security mechanism utilized to make PHP programming secure are evaluated below here.

Input Validation

Web applications takes user inputs from Form. Users cannot be trusted as they can submit malicious data that can exploit the system. Hackers use user input to perform attacks such as SQL injection and cross site scripting. PHP allows form validation from both client side and in server side. It is recommended to validate site from server side as client side validation are not secure enough as hacker can use bot to pass client side validation.

Additionally, SITEPOINT (n.d.) highlights the fact that user can easily turn off JavaScript in browser to bypass JavaScript validation. Hence even if form is validated from client side using JavaScript, application should be re-validate using PHP scripts.

Protecting Session Data

Session data are by default stored in temp directory. In a scenario when application is hosted in shared server, other user can program script and read session information. This is why it is must to not store password, personal information in session. PHP allows to encrypt session data which can provide some level of higher security. But it does not provide complete security. Better practice for PHP developer is to store session information in different directory.

Proper error handling

PHP allows developer to hide error messages from users. Errors are helpful while developing system but if errors can be viewed by users, they can get critical information such as database information, file name information etc. To prevent it PHP developer should hide errors.

Securing MySQL

PHP utilizes MySQL RDBMS technology to store information from web application. Since data is most important factor in web application, database security is a major components of web security. While developing web application it is essential to consider both PHP and MySQL security. Some of the security practices for MySQL is listed here below.

- SYMANTEC (n.d.) suggests while installing MySQL or configuring MySQL administrator name and password should be changed and complex choice should be taken
- Anonymous database access should be disabled
- Sample databases existed in database by default should be removed due to security concerns

Summary

This document critically evaluated various advantages and limitations of web application. During evaluated several functionalities of web application is also evaluated. Due to platform independent of the web applications, it is very popular and cost effective. Web application developed for MAC can easily run on windows or Linux, all it requires its compatible web browser. Unlike desktop based applications, web application are executed in web server and only web page is dynamically generated for client computer. This makes web application accessible from anywhere around the

world. People with knowledge of software installation can go to web browser and use web application (social networking site being example).

Though web application has few limitations such as dependency in internet, and security issues with correct implementation of security measurements, web application is suitable for nearly any business requirements. Further in this document, PHP and MySQL and their roles in web application is discussed. Various feature of PHP such as free and open source, object-oriented, platform independent etc. make it one of the most famous scripting language for web development. In the same time MySQL is utilized for database service together with PHP. And finally, various types of users should be taken into consideration while developing web application along with utilizing security methods provided by PHP and MySQL.

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Task 2

Critically compare different types of Server Side Programming Languages/Scripting Languages and examine web security concerns and make recommendation for security improvements. [1.2, 1.3]

Introduction

Scripting languages are used for writing programs that run on special run-time environment. Unlike C, C++ script languages are compiled but are interpreted. Development using script language includes software applications, web applications, games etc. But unlike Conventional programs, scripting language does not create executable files. Scripting languages can be categorized into two groups; client side scripting and server side scripting. This report critically compares various scripting languages. This report also examines web security concerns to make necessary recommendations.

Client Side Scripting

Client side script is type of scripting language that is interpreted in user's machine (generally browser). Some of the popular client side scripting languages are JavaScript and VBScripts. Later one is available for Microsoft platform only which makes JavaScript most popular client side scripting language due to its large platform support. When user request for web page, page with HTML tags and JavaScript codes is returned to browser. If browser running that page has JavaScript enabled, it runs JavaScript codes. Some of the beneficial uses of client side scripting are as follows:

- It helps to reduce load on server by validating user inputs
- It helps to design and develop interactive web page user interface
- Many resources are available that can be obtained for free

Client side scripting also exhibits various disadvantages while utilizing in web application as follows:

- All browsers do not support scripts or sometimes user may disable script from browser which can reduce UI quality of application and may show various warnings
- Different browser shows different behavior to client side scripts which can complicate things

Server Side Scripting

Server side scripts are executed on server which generates dynamic page for client upon request. It means no server side script reaches client's system but instead, dynamic HTML page is generated for user. Nowadays most sites on the Internet have dynamic content. This implies the substance showed to the client has not been composed straightforwardly into the HTML page but instead it has been created by selecting data from a database that lives on the server. When client tries to view source of the page, no server side scripting codes are visible and only output from the script visible as codes are already executed in server before reaching the client's system. Critical comparison between client side scripting and server side scripting is demonstrated below.

Comparison [Client Side/ Server Side]

Criteria	Client Side Scripting	Server Side Scripting
Running Environment	Runs on clients machine (Browser)	Runs in web server [IIS, APACHE]
Examples	Some of the client side scripting languages are JavaScript, VBScript, ActionScript, Typescript etc.	Some of the Server Side Scripting languages are ASP.NET, Java, PHP, Ruby, Perl etc.
Uses	1. Interactive user interface 2. Validation 3.	1. Dynamically generates contents 2. Validation 3. User input 4. Interaction with database 5. Provides ability to send email, access control, encryption etc.
File Access	File system that resides on web server is not accessible.	File system that resides on web server is accessible.
Blocking	User can disable client side scripting in the browser	User cannot disable server side scripting
Processing Time	Response time generally faster than server side as it runs locally	Slightly slower than client side as it is processed on remote server

Different types of Server Side Scripting

This paper has already critically compared different types of scripting languages. While developing a web application programmer has massive option for server side scripting to choose from. Some

of them being PHP, ASP.Net, JAVA, Perl etc. This paper further critically compares PHP and ASP.Net scripting languages.

PHP

PHP is open source server side scripting language. It's been popular in web application development due to its large developer community and easy learning curve.

ASP.Net

ASP.NET scripting was created by Microsoft to give programmers simple scripting tool to develop web applications. ASP.NET is successor to Active Server Pages known as ASP.

Critical Comparison [PHP/ ASP]

Criteria	PHP	ASP.NET
Data Storage	PHP uses MySQL for storage	Mostly, ASP.NET uses SQL server for storage
Tools available and Ease of Usage	PHP scripting can be done using any text editor. Programmers may prefer website design tools such as Dreamweaver to manage application but it is optional	ASP.NET programmers relies heavily on Visual Studio.
Database Connectivity	PHP utilizes mysql_query to connect with database	ASP.net utilizes ODBC to connect with database
Cost	PHP and MySQL is free and does not require licensing fees	ASP.Net is available free for windows user but for popular sites it requires licensing and developer must use windows
Support	Due to large community, great support is available	Limited support is available

Web Security Concerns

For many organization web security does not become top priority until security breach is not occur. In today's world it is very common for website of any kind to have security vulnerability that can be exploited by hacker. It does not matter what scripting language is used, all languages equally has these security concerns. To examine web security concern, some of the most common threats are discussed below here.

SQL Injection

SQL injection are the point at which a hacker uses a web structure field or URL parameter to access or control application database. When you utilize standard Transact SQL it is anything but difficult to accidentally embed rebel code into your inquiry that could be utilized to change tables, get data and erase information.

By utilizing inject, an attacker can trap web application into executing unintended summons or getting to unapproved information. An injection can bring about an attacker accessing and changing, ruining or erasing application information or even completely delete the system.

Cross Site Scripting

This is a genuinely far reaching info purification disappointment. An aggressor gives your web application JavaScript codes as data. At the point when this data is come back to the client unfiltered, the client's program will execute it. It can be as straightforward as making a connection and inducing a client to snap it, or it can be something significantly viler. XSS fundamentally targets scripts installed in a page which are executed on the customer side (in the client's web program) as opposed to on the server-side. XSS in itself is a risk which is achieved by the web security shortcomings of customer side scripting dialects, with HTML and JavaScript (others being VBScript, ActiveX, HTML, or Flash) as the prime offenders for this adventure. The idea of XSS is to control customer side scripts of a web application to execute in the way coveted by the malignant client. Such a control can insert a script in a page which can be executed at whatever point a related occasion is performed or at whatever point the page is loaded.

Broken authentication and session management

Authentication and session management sometimes not actualized accurately, which permits a programmer to trade off passwords, keys, session tokens, or adventure other site usage blemishes to accept a genuine site client's character. Verification and session administration incorporates all parts of taking care of client confirmation and overseeing dynamic sessions. Validation is a basic part of this procedure, yet even strong confirmation systems can be undermined by imperfect qualification administration capacities, including password change, forgot my password, remember my password, account update and other related capacities.

Security Misconfiguration

Security misconfiguration in web server and application is very common and this could be exploited by hacker to gain access to system. Some of the most common misconfigurations are,

allows users to view the error message, using default passwords, using outdated technologies. Every web application should go through security configuration as this security concern is far too common than it seems and hacker always tries to exploit misconfiguration first.

Recommendation for security Improvement

As discussed above, web application has to face various web security concerns. Hence, every web application developer should practice necessary measurements to secure their application. One of the most common and effective way of securing web is filtering user inputs. As discussed in web security concerns, most of the security flaws [SQL inject, XSS] uses user form to inject code. Filtering form would prevent attackers from submitting malicious data. Another way is to continually utilizing parameterized inquiries, most web dialects have this element and it is anything but difficult to execute. Additionally, it is recommended to not set default passwords, use latest technologies and disable users from viewing error messages.

Task 3 [2.1, 2.2, 2.3, M2]

Design a web application to meet a given requirement and **synthesis** client side and server side functionality in web application in your design and apply database for user in a web application.

Introduction

This document utilizes various tools and technologies to design web application to meet business requirement of the system. Graphical software is utilized to design user interface for the project. Similarly, to design database system, MySQL is utilized. To plan database and user interface for the system, tools such as use case diagram and schema model is used.

Use-Case Diagram

Use case charts are considered for abnormal state necessity examination of a framework. So when the prerequisites of a framework are broke down the functionalities are caught being used cases. So we can say that uses cases are only the framework functionalities written in a sorted out way. Presently the second things which are applicable to the utilization cases are the Actor. Actor can be characterized as something that collaborates with the framework. The actor can be human client, some interior applications or may be some outside applications.



Figure 2 Use Case diagram for Online Mobile Shop System

Justification

Use case diagram for online mobile shopping system is developed above. It has two actors, administrator and users. Each actor has relation with various cases. According to use case, both admin and user requires to login the system. Admin can manage users, products, brands, while users can purchase, add to cart, view and sign up. Both user and admin can logout from the system. This diagram helps to understand overview of the system.

Actor Admin should first login into the system before being able to manage products which includes deleting, updating, and creating products. Similarly, he/she requires to login to manage brands and users. On the other hand user requires to sign up first before login into the system. Then he/she can explore products, add products to cart and purchase them.

User Interface Design

User interfaces layout for the system is designed using graphical tool “Photoshop”. These layouts are later converted into real webpages. It is always good practice to design layout in Photoshop first as it gives overview of how system would look when it's ready. It is also a way to display design prototypes to project stakeholders, sponsors while proposing the idea.

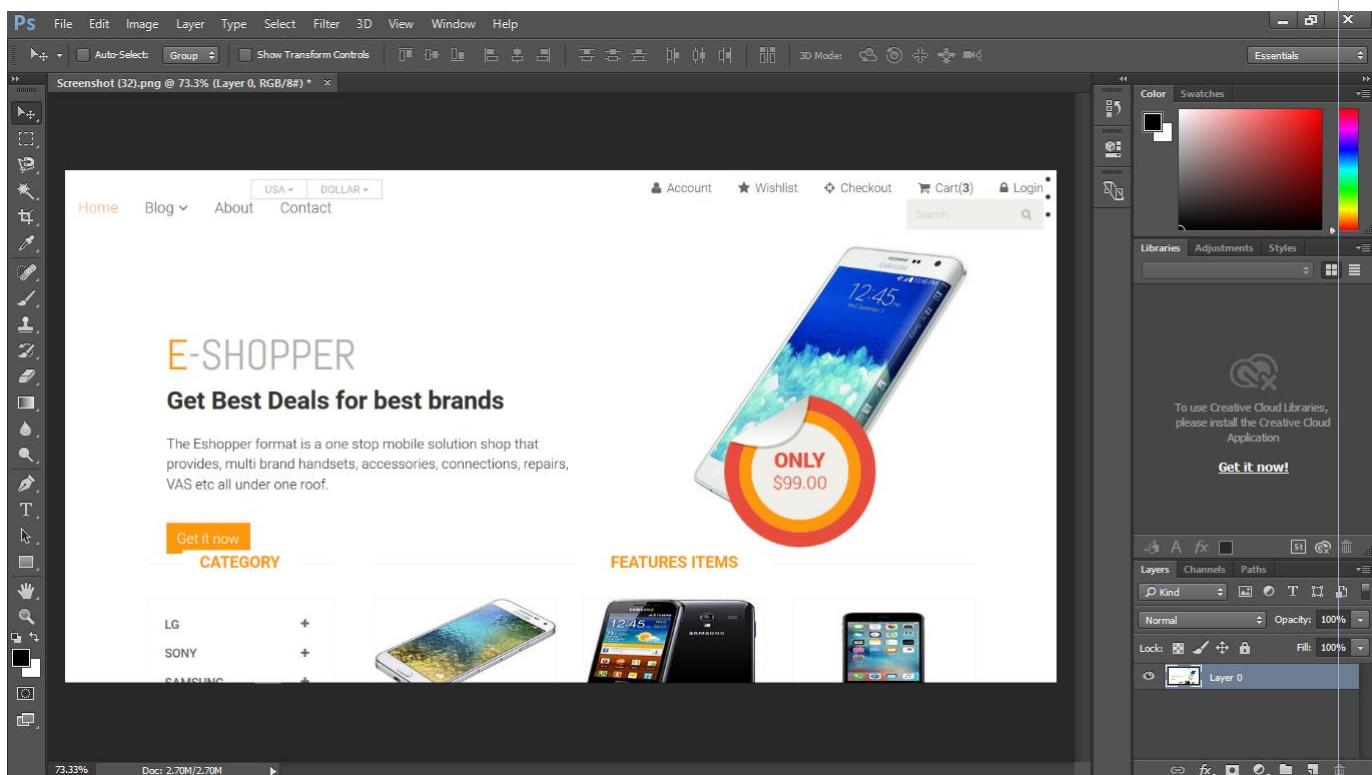


Figure 3 Layout design using Photoshop

User interface layouts for the given project is designed below using Photoshop.

General Client

Home

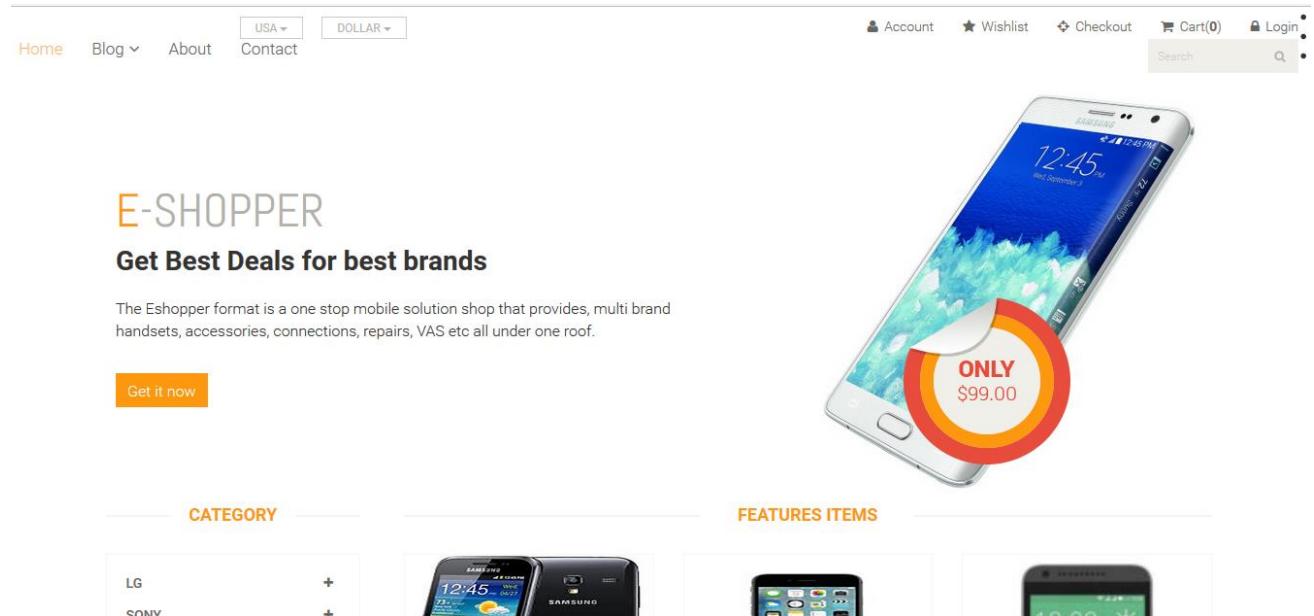


Figure 4 Home Page

Navigation Menu

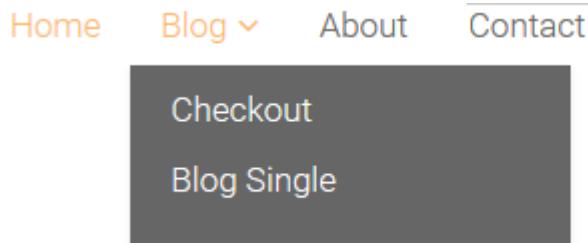


Figure 5 Navigation menu

Contact Us

GET IN TOUCH

Name	Email
Subject	
Your Message Here	

Submit

Figure 6 Contact up layout

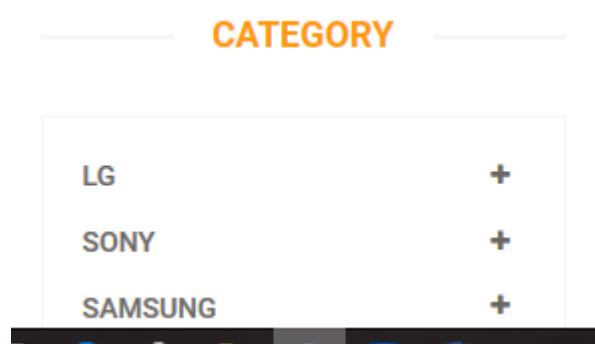
Side Menu

Figure 7 Side menu

Product Detail

FEATURES ITEMS

Samsung Black220

Android OS, v5.1.1 (Lollipop) CPU Quad-core 1.2 GHz Memory Card slot microSD, up to 128 GB Internal 8 GB, 1.5 GB RAM Camera Primary 8 MP, 3264 x 2448 pixels, autofocus, LED flash Features Geo-tagging, touch focus, face detection Video 1080p@30fps Secondary 5 MP

NPR.21000

Samsung Black220

Add to cart

Figure 8 Product Detail layout

Login

Login to your account

Keep me signed in

Login

Figure 9 Login Form

Signup

New User Signup!

Name
meet_atutgorkhali@yahoo.com

Confirm Password
Phone
Address
 No file selected.

Figure 10ISignup form

Cart

Item	Price	Quantity	Total
 G77 Samsung G77 RAM: 1GB Camera: 5MP Memo... read more	NPR.12000	<input type="button" value="1"/> Delete	
 HTC 620 G 1.7 GHz, octa-core Android OS, v4.4.4 (... read more	NPR.31000	<input type="button" value="0"/> Delete	
 HTC 620 G 1.7 GHz, octa-core Android OS, v4.4.4 (... read more	NPR.31000	<input type="button" value="1"/> Delete	

Total: 43000

Figure 11Cart layout

Administrator Panel

Login

Username	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/>	

Figure 121 Login form for admin

Admin Panel

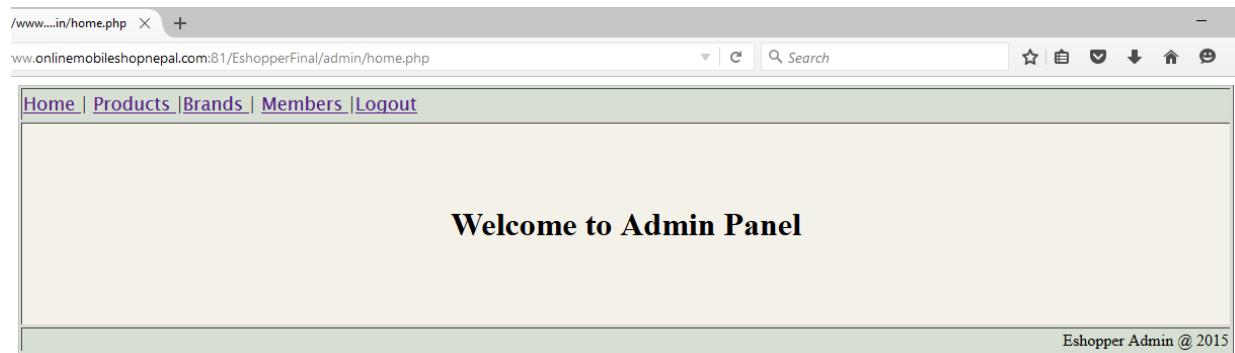


Figure 132 Admin panel Layout

View Brand

Home Products Brands Members Logout			
+ Add Brands	Brand ID	Brand Name	Action
	4	LG	Edit Delete
	6	Sony	Edit Delete
	7	Samsung	Edit Delete
	8	Apple	Edit Delete
	9	HTC	Edit Delete
	11	Micromax	Edit Delete

Eshopper Admin @ 2015

Figure 14 View Brand Layout

Add new Product

Home Products Brands Members Logout			
Model Name	<input type="text"/>		
Price	<input type="text"/>		
Description	<input type="text"/>		
Upload Image	Select Image:	<input type="button" value="Browse..."/>	No file selected.
Select Brand	<input type="button" value="--select brand--"/>		
<input type="button" value="Save"/>			

Eshopper Admin @ 2015

Figure 15 Add product Layout

[View Members](#)

Home Products Brands Members Logout																			
<table border="1"> <thead> <tr> <th>Member Name</th><th>Phone</th><th>Address</th><th>Email</th><th></th></tr> </thead> <tbody> <tr> <td>Atut Gorkhali</td><td>2147483647</td><td>Kathmandu</td><td>meet_atutgorkhali@yahoo.com</td><td>Send Email Delete</td></tr> <tr> <td>Nabin Kumar Singh</td><td>9812312</td><td>Kathmandu</td><td>nabinksingh@yahoo.com</td><td>Send Email Delete</td></tr> </tbody> </table>					Member Name	Phone	Address	Email		Atut Gorkhali	2147483647	Kathmandu	meet_atutgorkhali@yahoo.com	Send Email Delete	Nabin Kumar Singh	9812312	Kathmandu	nabinksingh@yahoo.com	Send Email Delete
Member Name	Phone	Address	Email																
Atut Gorkhali	2147483647	Kathmandu	meet_atutgorkhali@yahoo.com	Send Email Delete															
Nabin Kumar Singh	9812312	Kathmandu	nabinksingh@yahoo.com	Send Email Delete															
Eshopper Admin @ 2015																			

Figure 16 View Member layout

[Schema-Model](#)

A schema diagram is the structure behind information association. It is a visual representation of how different tables are relational with each other. Schema diagram describes various database objects, their attributes and relationship. In Schema all database tables are drawn along with their attributes and unique features such as primary key. Table relation is also described using foreign a primary key. Schema model allows to study and database system for the project.

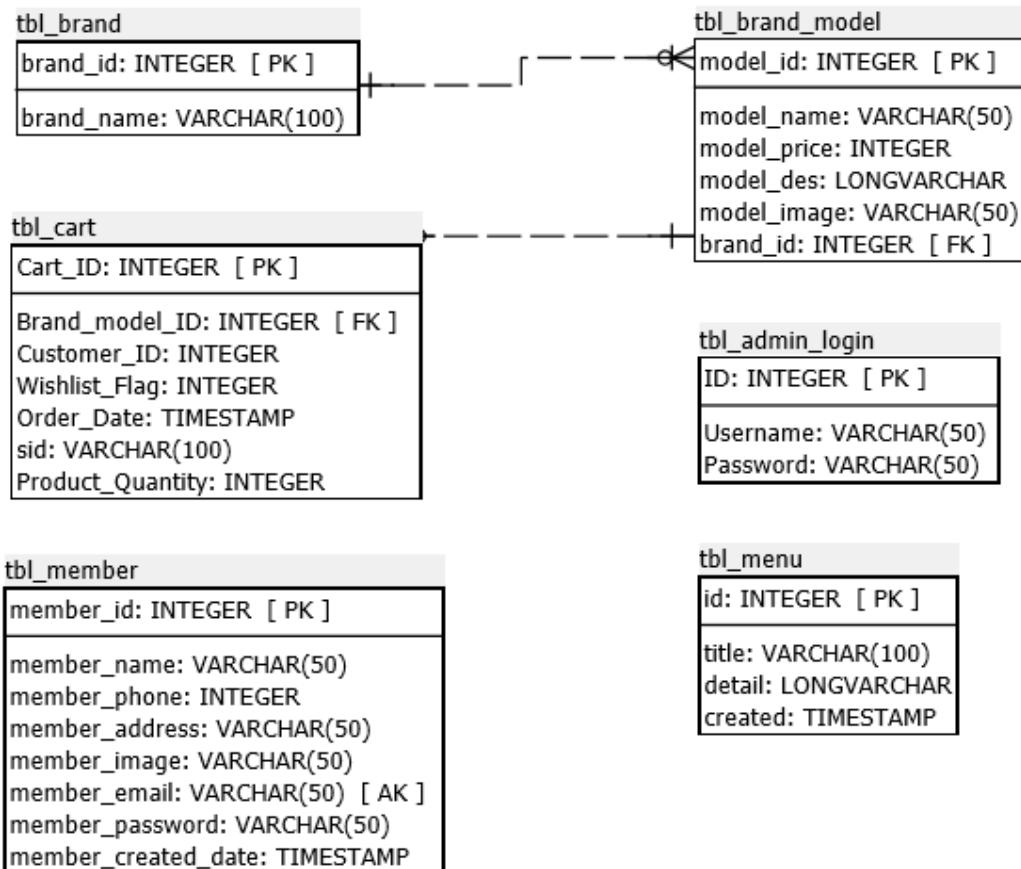


Figure 17 schema Diagram for proposed web application

Justification

Design schema diagram for the system consists of tables for brand, model, members, cart, admin and menus. Attributes for each table and relation between tables are described using PK and FK [primary key and foreign key]. Design shows model table has brand id as foreign key which means all models are in relational with brand. Similarly, all cart data is in relation with model. Utilizing schema diagram, database for the system will be designed.

Overall design Justification

Design for the project is analyzed using various tools such as use case and schema diagram before using Photoshop to design layouts and Phpmyadmin to design database. Now table below justifies the choice of design for the project.

S.N.	Designed Module	Reason
1	Login Module	Separate login modules for admin and users are designed to for authentication and authorization and securing web application
2	Product Module	Product module is designed to allow administrator manage the products
3	Brand Module	This module will allow administrator to manage brands
4	Signup Module	New clients will sign up using this module
5	Cart Module	Users will be all be manage cart using this module
6	Purchase	Users will be able to purchase mobile using this module
7	View Products	User will be able to explore mobiles using this module.

Task 4

Evaluate alternative design and solutions to meet given requirement. [2.4]

Front End Design

UI design and Database design for given project is planned and designed in previous document. This document now evaluates various technologies for those designs. Front end design implementation, database design for the system and tackling web security issues in new system is evaluated.

Front end design is what client sees in the web browser. Front end refers to a user's direct interaction with system. Front end design is also known as client side design. While assessing the front end plan, it is important to discover the guests learning background in a site that must be made. The assessment procedure ought to be done toward the start of the task, before we begin including substance and outline. Amid the period of arranging or planning developmental assessment should be did for testing the viability of what we are making. Graphical tool such as Photoshop is utilized in previous paper to design UI for the system. Now these designs are evaluated to implement in the project. HTML, CSS and JavaScript is utilized to prepare front end design for the system.

HTML

Hypertext Markup Language (HTML) defines structure of the page and foundation of web application. In given example below [figure 1] Login form is designed using HTML tags.

User:	<input type="text"/>
Pass:	<input type="password"/>
<input type="button" value="Login"/>	

Figure 18Front End Interface

```

<tr>
    <td>User:</td>
    <td>
        <input type="text" name="user"></td>
    </tr>
    <tr>
        <td>Pass:</td>
        <td><input type="text" name="pass"></td>
    </tr>
    <tr>
        <td colspan="2" style="text-align: center">
            <input type="submit" value="Login" style="width:200" align="middle">
        </td>
    </tr>

```

Figure 19 HTML Tags for Login Form

JavaScript

JavaScript is client side scripting languages. JavaScript is utilized in project to improve interactivity of the application and validating the forms. Example below shows use of JavaScript to validate signup form for signup module (figure 3).

```

if(!regularExpression.test(password1))
{
    document.getElementById('password1').focus();
    document.getElementById('password1_error').innerHTML='password should contain atleast one number
and one special character';
    return false;
}
if (name=="")
{
    //alert('Enter Name');
    document.getElementById('name').focus();
    document.getElementById('name_error').innerHTML='Enter Name';

    return false;
}

else if (email=="")
{
    //alert('Enter email');
    document.getElementById('email').focus();
    document.getElementById('email_error').innerHTML='Enter email';

    return false;
}
/*else if (!re.test(email))

```

Figure 20Javascript Validation

CSS

Cascading style sheet maintains the presentation of web application combining with HTML. It provides style to the web pages. Example below (figure 4) shows CSS codes used in system to improve user interface of the system.

```

body {
  font-family: 'Roboto', sans-serif;
  position: relative;
  font-weight: 400px;
}

ul li {
  list-style: none;
}

a:hover {
  outline: none;
  text-decoration: none;
}

a:focus {
  outline: none;
  outline-offset: 1px;
}

```

Figure 21 CSS in online Mobile Shop

Database Design

Database is fundamental requirement of a web application. All information in application about news, brands, cart, members, admins etc. are stored in database system. User interface and database system is linked together with help of backend programming. Database design for the online mobile shopping system is designed using schema diagram in previous paper. Utilizing that diagram and using Phpmyadmin MySQL database for the system is developed.

Phpmyadmin

PHP has written a free and open source tool called Phpmyadmin. This tool handle the organization of MySQL with the utilization of a web program. It can perform different assignments, for example, making, altering or erasing databases, tables, fields or columns; executing SQL proclamations; or overseeing clients and authorizations. For online mobile shopping, database is designed using Phpmyadmin. Database includes various table, their relationship and their attributes.

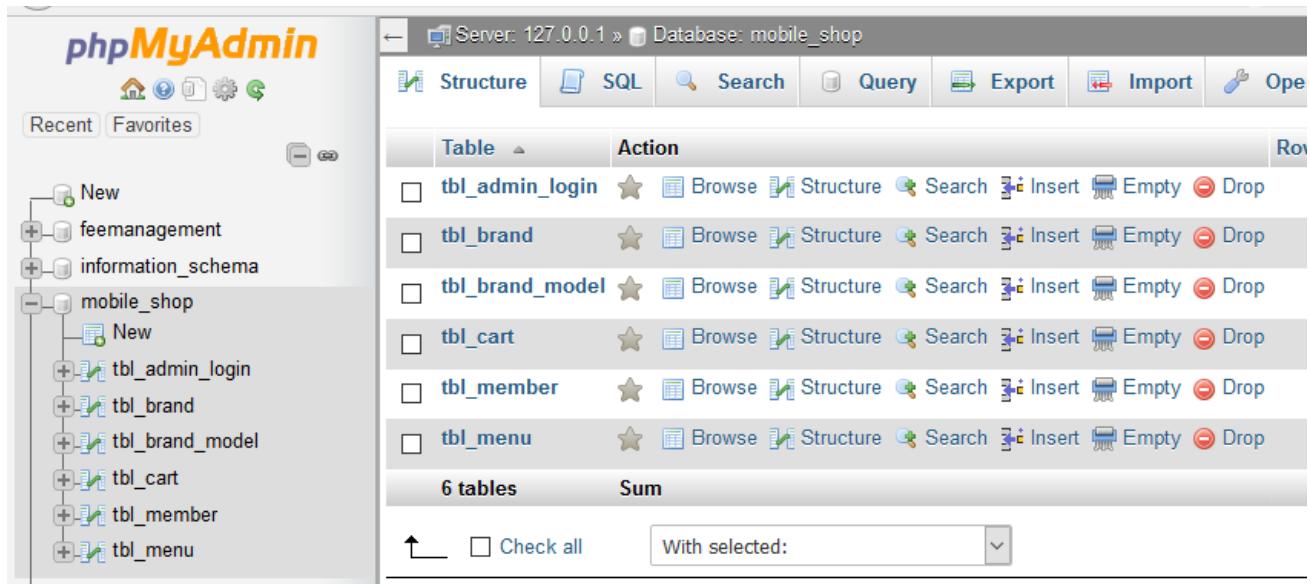


Figure 22 Database design for the web application

Web security Issues

While evaluating alternative design and solution some of the mechanism utilized in designed system to tackle web security issues are discussed briefly here.

Password Encryption

Password encryption is great tool to prevent database user viewing member's password. Password is encoded into secret form to secure password. For encoding secret key, MD5 sort has been utilized which limits us to see the watchword of client's or administrator. MD5 changes a secret word made of numbers or letters in order into a long arrangement of letters in order and numbers which make the programmers hard to break the watchword. For instance: "Atut Gorkhali" is changed to "e5eb4aaac4be26be93c5bacee6fa62c1". So we have utilized this framework to encode the password word of clients of our framework.

```
member_password=md5('$_member_password');
```

Figure 23 Use of MD5 to encrypt password

Post Method

While submitting a form, POST method is utilized while submitting critical form such as login form, transaction form etc. POST is more secured option than GET method as it hides data in URL and browser does not store history.

```

<form method="post" action="login.php" id="loginForm">
<?php if(isset($_GET['msg']) && $_GET['msg'] == "err") { ?>
<tr>
<td colspan="2"><p>Invalid username or password!</p> </td>
</tr>
<?php } ?>
<tr>
<td colspan="2" style="text-align: center;">

```

Figure 24POST method for securer submission

SQL injection

To tackle with inject flaws such as SQL injection, system can utilize Form validation. Form for the system can be done in on client level as well as server level. Form validation would help to filter suspicious input and prevent injection attacks like SQL inject. Successful SQL injection can read delicate information from the database, adjust database information (Insert/Update/Delete), execute organization operations on the database, (for example, shutdown the DBMS). Hence necessary steps need to be taken to secure site against such issues.

Summary

This document evaluates alternative designs and solutions to satisfy the requirement. Front End of the system is implemented using style sheet, markup language and client side scripting. To create User interface, html works as foundation for the UI and CSS helps to style the foundation. To make UI interactive system have utilized JavaScript. Furthermore, this document also develop database design using Phpmyadmin. Database design is justified by evaluation of schema diagram. And finally, various web security issues tried to tackle in this project is briefly discussed.

Task 5

Implement a web application to prepared design using client side and server side scripting languages. Also **implement** web enabled database system to store, retrieve and manipulate data in web application and **identify and implement** opportunities for error handling and reporting.

Introduction

This paper documents implementation of web application. Various tools and technologies utilized while designing user interfaces and database system for the proposed system. This document implements backend system using scripting languages to store, manipulate and retrieve data in application. Before implementing the system, it is essential to review the business requirements as well as select and plan proper system development life cycle to manage the system project.

Business requirement

To understand business requirements, various fact finding tools such as interview, feedback, questionnaire etc. were utilized. Business requirement summary for the given online mobile shopping system is given below. [Figure 1]

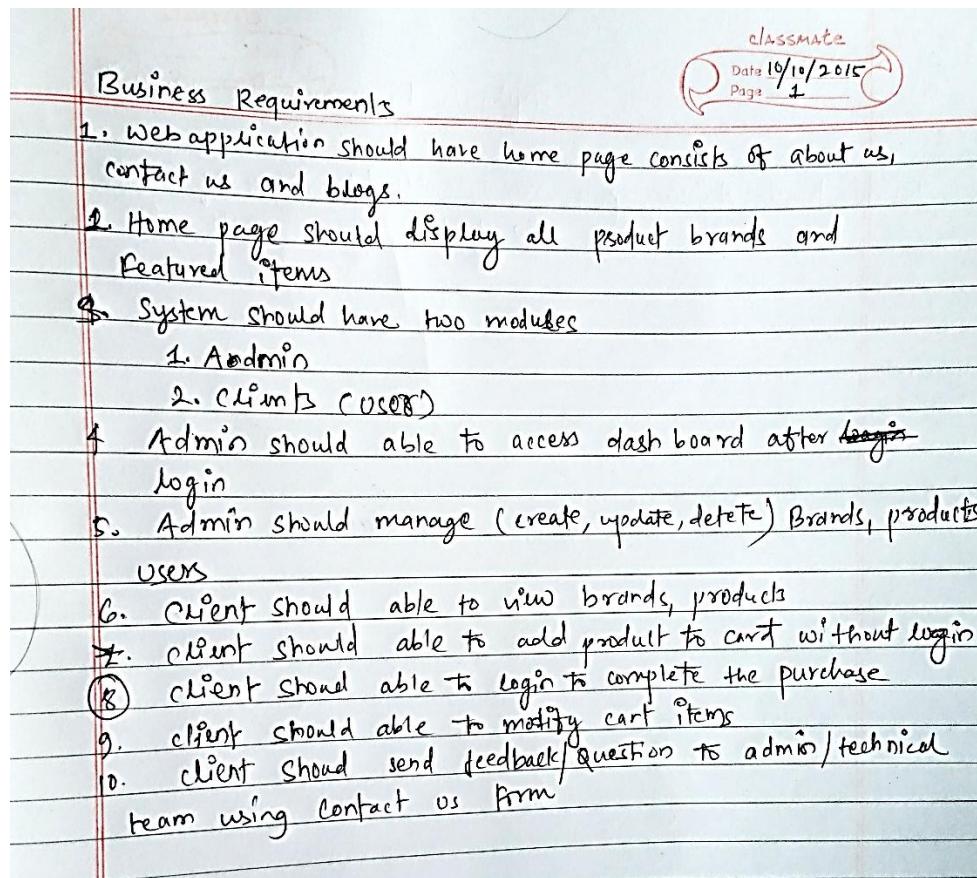


Figure 25 Business requirements

To satisfy business requirements following components are implemented in the developed system.

- Login System
- Client Home Page consisting links to about us, contact us and blogs
- Admin Panel
- User Management
- Product Management
- Brand Management
- Add to cart
- Purchase
- Contact Form [Contact us]

System Development Model

System Development Life Cycle (SDLC) for the project is identified and selected to plan various phases of the project and then describe each phases. Developing system based on a SDLC helps to achieve business requirement and develop quality product. Based on the nature of the system, waterfall development model is selected for the project. Each phase and their purpose in prepared SDLC plan is described below.

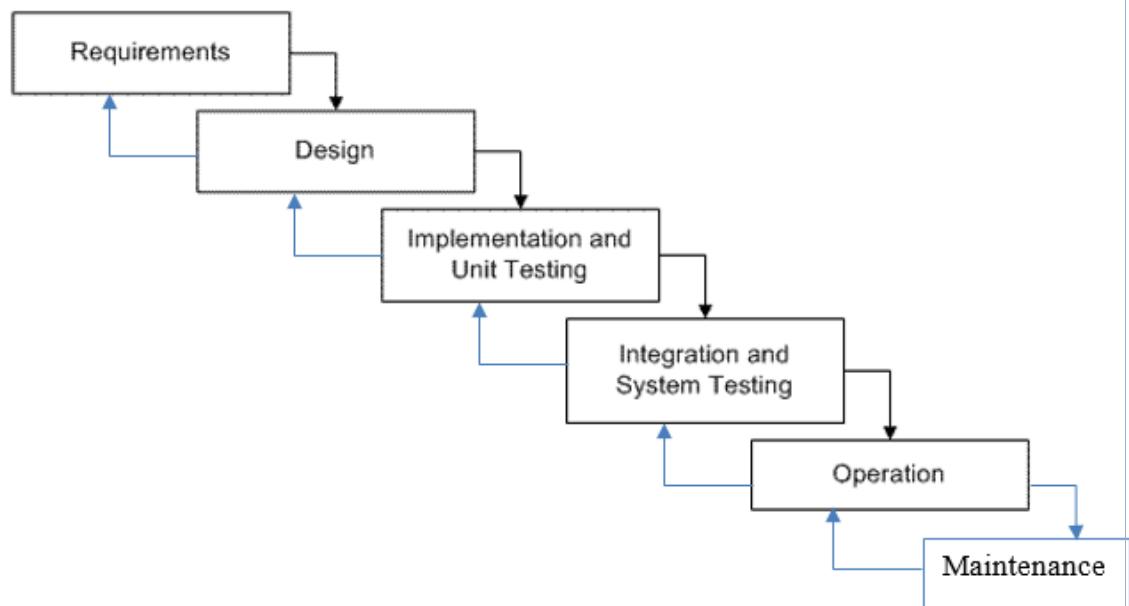


Figure 26 SDLC for the project

- **Requirement gathering and analysis**

This phase will conduct various fact finding to identify functional and nonfunctional requirements. Feasibility of the system is evaluated and Software requirement Specification is prepared.

- **Design**

In this phase, system is designed. Tools and technologies such as schema diagram, use case etc. is utilized to plan system design. UI and database system is also designed. This project utilized tools like Photoshop to design UI and MySQL for database design.

- **Implementation / Develop**

After system is design and planned, Implementation phase develops the system based on design specification from design phase. Online mobile shopping project implements Front End and Back End during implementation phase. HTML, CSS and JavaScript is utilized for front end implementation where as PHP and MySQL is utilized for back end implementation.

- **Testing**

After Implementation of system, project is tested using various testing techniques is conducted before deployment. These techniques includes stress testing, integration testing, compatibility testing. Testing is documented as test log and analyzed for maintenance recommendation. Testing and debugging test is repeated until product achieves acceptance level.

- **Deployment/ Operation**

After developed project is reaches acceptable level during iteration of testing and debugging it is prepared to be released. Online mobile shopping system will be uploaded to web server so than anyone could access them.

- **Maintenance**

Further maintenance of the system will be done based on the feedbacks provided by users through feedback form.

Implementation of Web application

Both client side and server side scripting is utilized while implementing system for online mobile shopping system. PHP is used as server side and JavaScript is used ad client side scripting language.

Administrator Roles

Administrator roles consists of login, product management, brand management and member management modules.

Login Module

Login.php

```
<?php
require("../class/class.parent.php");
extract($_POST);
$obj = new Eshop;
$count = $obj->selectLogin($user,$pass);
if($count == 1 ) {
    echo "success";
header("location:home.php");
}
else
{
    echo "error";
header("location:index.php");
}
?>
```

Check_login.php

```
<?php
extract($_POST);
$sql=$obj->check_login($member_email,$member_password);
?>
```

Database integration

```
function selectLogin($user, $pass)
{
    $conn = mysql_connect("localhost", "root","");
    mysql_select_db("mobile_shop",$conn);
    $sql ="select Username,Password from tbl_admin_login
    where Username = '$user'
    and Password = '$pass'";
    if($result=mysql_query($sql,$conn)){
        $count = mysql_num_rows($result);
        return $count;
    }
}
```

Product Management

[View Products](#)

```

<tr>
    <td>Model Name</td>
    <td>Model Price</td>
    <td>Description</td>
    <td>Image</td>
    <td>Brand Name</td>
    <td>Action</td>
</tr>
<?php

$sql=$obj->view_products();
while($row=mysql_fetch_array($sql)){
?>
<tr>
    <td><?php echo $row[1] ?></td>
    <td><?php echo $row[2] ?></td>
    <td><?php echo $row[4] ?></td>
    <td></td>
    <td><?php echo $row[5] ?></td>
    <td><a href = "home.php?page=edit_product&id=<?php echo $row[0] ?>">Edit </a> | <a onclick="return val
ef="home.php?page=del_products&id=<?php echo $row[0] ?>"> Delete </a></td>
</tr>

<?php } ?>

```

[Database integration](#)

```

private function SelectModel()
{
    $sql = mysql_query("select M.model_id,
    M.model_name,M.model_price,M.model_image,M.model_des,B.brand_name from tbl_brand as B, tbl_brand_model
    as M where B.brand_id=M.brand_id ");
    return $sql;
}

```

[Drop down in New Product page](#)

```

<?php
    $res = $obj->selectBrand();
    while($row = mysql_fetch_array($res)) {
?>
<option value="<?php echo $row[0]; ?>"><?php echo $row[1]; ?></option>
<?php } ?>

```

Delete Products

```

<?php
$id=$_GET['id'];
$img=$obj->selectImg($id);
$del=$obj->del_products($id);
if ($del)
{
    unlink('products/'.$img[0]);

    echo "<script>alert('Data deleted!!!')</script>";
    echo "<script>window.location='home.php?page=view_products'</script>";
}
else
{
    echo "<script>alert('Data not deleted!!!')</script>";
    echo "<script>window.location='home.php?page=view_products'</script>";
}

?>

```

Brand Management

View Brands

```

<?php

$sql=$obj->selectBrand();
while($row=mysql_fetch_array($sql)){
?>
<tr>
<td><?php echo $row[0] ?></td>
<td><?php echo $row[1] ?></td>
<td><a href = "home.php?page=edit_brand&id=<?php echo $row[0] ?>">Edit </a> | <a onclick="return validate()" href="home.php?page=del_brands&id=<?php echo $row[0] ?>"> Delete </a></td>

```

Insert Brand

```

<?php
extract($_POST);
if($obj->brandAdd($bname)){
    header("Location:home.php?page=view_brand&msg=success");
}
else{
    header("Location:home.php?page=brands&msg=err");
}

?>

```

Edit Brand

```

<?php
extract($_POST);
if ($obj -> updateBrand($bname,$bid)){
echo "<script>window.location='home.php?page=view_brand&msg=success'</script>";
}
else{
    echo $bname;
    echo $bid;
    die("Error! Could not update brand!");
}

?>

```

Database Integration

```

function updateProduct($mname, $mprice, $mdesc, $mimagine, $mbrand, $mid){
$sql = mysql_query("update tbl_brand_model set model_name='$mname',
model_des='$mdesc',
model_image='$mimagine',
brand_id='$mbrand',
model_price='$mprice' where model_id = $mid
");
return $sql;
}

```

Delete Brand

```

<?php
$id=$_GET['id'];
$del=$obj->del_brands($id);
if ($del)
{
    echo "<script>alert('Data deleted!!!!')</script>";
    echo "<script>window.location='home.php?page=view_brand'</script>";
}
else
{
    echo "<script>alert('Data not deleted!!!!')</script>";
    echo "<script>window.location='home.php?page=view_brand'</script>";
}

?>

```

Image File Uploading

```

<?php
$name = $_FILES['imge']['name'];
$path = $_FILES['imge']['tmp_name'];

echo $path;
move_uploaded_file($path,'uploadedimage/'.$name);

?>

```

Image File Removing/Deleting

```
unlink('products/' . $img[0]);
```

Member Management

View Members

```

<?php
    $row = mysql_fetch_array($result);
    ?>
    <tr>
        <td><?php echo $row[1] ?></td>
        <td><?php echo $row[2] ?></td>
        <td><?php echo $row[3] ?></td>
        <td><?php echo $row[4] ?></td>
        <td><a href="#">Send Email</a> | <a onclick="return validate()" href="home.php?page=del_member&id=<?php echo
        $row[0] ?>"> Delete </a></td>
    </tr>

```

Delete Member

```

public function del_member($id)
{
    $sql=mysql_query("delete from tbl_member where member_id=$id");
    return $sql;
}

```

Significance of Administrator roles

- Administrator has access to neat dashboard
- Has access to member management
- Product Management
- Brand Management
- Can upload product images

User Roles

User roles consists of add to cart, view product, login, contact us modules.

Sign UP

```

<?php
extract($_POST);

$sql=$obj->signup($name,$phone,$address,$image,$email,$password);
if ($sql)
{
    echo "<script>
                window.location='index.php?page=update_cart';
            </script>";
}

?>

```

Database Integration

```

function signup($member_name,$member_phone,$member_address,$member_image,$member_email,$member_password)
{
    $sql=mysql_query("insert into tbl_member set
        member_name='$member_name',
        member_phone='$member_phone',
        member_address='$member_address',
        member_image='$member_image',
        member_email='$member_email',
        member_password=md5('$member_password')");
    if ($sql)
    {
        return $sql;
    }
    else
    {
        die("Error! signup failed!");
    }
}

```

Login

```

<?php
extract($_POST);
$sql=$obj->check_login($member_email,$member_password);
?>

```

Database Integration

```

function check_login($member_email,$member_password)
{
    $sql = mysql_query("select * from tbl_member
        where member_email = '$member_email'
        and member_password = md5('$member_password')");

    $count = mysql_num_rows($sql);
    $row=mysql_fetch_row($sql);
    $memid=$row[0];
    if ($count==1)
    {
        $_SESSION['name']=$member_email;
        $_SESSION['customer_ID']=$memid;
        $updatecart=$this->update_cart_customer(session_id(),$memid);
        echo "<script>
            window.location='index.php?page=member_profile';
        </script>";

    }
    else{
        die("Error! Login failed!");
    }
}

```

Select Product

```
<div class="single-products">

    <div class="productinfo text-center">
        
        <h2>NPR.<?php echo $row['model_price'];?></h2>
        <p><?php echo $row['model_name'];?></p>
        <a href="index.php?page=cart&brand_model_id=<?php echo $row['model_id'] ?>
            <i class="fa fa-shopping-cart"></i>Add to cart</a>
    </div>

    <div class="product-overlay">
        <div class="overlay-content">
            <!--
            <h2>NPR.<?php echo $row['model_price'];?></h2>
            <p><?php echo $row['model_name'];?></p>
            <a href="index.php?page=cart&brand_model_id=<?php echo $row['model_id'] ?>
                <i class="fa fa-shopping-cart"></i>Add to cart</a>
            </div>
        </div>
    </div>
</div>
```

Add to Cart

```
<?php
$brand_model_id=$_GET['brand_model_id'];
$sid = session_id();
$sql=$obj->Add_toCart($customer_id=1,$brand_model_id,$wishlist_flag=0,$sid);
if ($sql)
{
    echo " <script>
        window.location='index.php?page=sub_items&id=$brand_model_id';
        </script>  ";
}
?>
```

Database Integration

```
function Add_toCart($customer_id,$brand_model_id,$wishlist_flag,$sid)
{
    $sql=mysql_query("insert into tbl_cart set
        Customer_ID=$customer_id,
        Brand_model_ID='$brand_model_id',
        Wishlist_Flag=$wishlist_flag,
        sid='$sid',
        Product_Quantity=1");
    if ($sql)
    {
        return $sql;
    }
    else
    {
        die("Error! Product not added to cart");
    }
}
```

Contact US

```

<?php
    header('Content-type: application/json');
    $status = array(
        'type'=>'success',
        'message'=>'Thank you for contacting us. We will contact you as early as possible.'
    );

    $name      = @trim(stripslashes($_POST['name']));
    $email     = @trim(stripslashes($_POST['email']));
    $subject   = @trim(stripslashes($_POST['subject']));
    $message   = @trim(stripslashes($_POST['message']));

    $email_from = $email;
    $email_to = 'Support@EshopperMobile.com';//replace with your email

    $body = 'Name: ' . $name . "\n\n" . 'Email: ' . $email . "\n\n" . 'Subject: ' . $subject . "\n\n" . 'Message: ' .
    $message;

    $success = @mail($email_to, $subject, $body, 'From: <'.$email_from.'>');

    echo json_encode($status);
    die;
?>
```

Significance of User roles

- User has access to home page consists of links to about, contact, blogs and other pages
- Has access to add to cart module to add item to car
- Can send message to administrator/support team
- Can login or sign up

Error Log

To log the errors following scripting template is utilized. This template will help hiding error message from user and recording them in file. In example below, thrown error will be captured and stored in place of Error Content

```

<?php
date_default_timezone_set("Asia/Kathmandu");
$filecontent=fopen("log.txt","a");
fwrite($filecontent,date('Y-m-d h:i:s')."Error Content"."\\r\\n");

?>
```

Significance of Server Side Scripting

- Allowed to store and display brand, product, member information
- Allowed database integration with UI to retrieve and manipulate web application data
- Achieve business requirement of the system

Client Side Scripting

In developed system client side scripting is utilized in form validation and delete confirmation page.

Validating

```

function callme()
{
    document.getElementById('name_error').innerHTML="Enter Numeric only";
}
function validateSignUp()
{
    //var newPassword = document.getElementById('password1').value;
    var minNumberofChars = 6;
    var maxNumberofChars = 16;
    var regularExpression = /^[a-zA-Z]{6,16}$/;
    var regularExpression = /^(?=.*[!@#$%^&*])/;
    alert(newPassword);

    //var re = /\S+@\S+\.\S+/;
    //alert("TEST");
    //by getElementById
    var name=document.getElementById('name').value;
    //by form name
    var email=document.signupForm.email.value;
    //alert(email);
    var password1=document.getElementById('password1').value;

    var password2=document.getElementById('password2').value;

```

Confirm Delete

```

<script>
function validate(){
    //alert('hello world!');
    //confirm box
    if (confirm('Are you sure to delete this brand?'))
    {
        return true;
    }
    else{
        return false;
    }
}
</script>

```

Significance of Client side scripting

- Helps from injection flaws by filtering user inputs
- Helps to prevent deleting objects by mistake

Error Handling

Developed system utilizes die () function as well as try, throw and catch for error handling.

Die ()

```
<?php
extract($_POST);
if ($obj -> updateBrand($bname,$bid)){
echo "<script>window.location='home.php?page=view_brand&msg=success'</script>";
}
else{
    die("Error! Could not update brand!");
}
?>
```

Figure 27 Error handing using die () function

Try, Throw and Catch

```
try{
    $sql=$obj->selectBrand();
    if(!$sql){
        throw new Exception('Connection Error');
    }
    while($row=mysql_fetch_array($sql)){
    ?>
    <tr>
        <td><?php echo $row[0] ?></td>
        <td><?php echo $row[1] ?></td>
        <td><a href = "home.php?page=edit_brand&id=<?php echo $row[0]?>">E
href="home.php?page=del_brands&id=<?php echo $row[0]?>"> Delete </a></
</tr>
    <?php }
    catch (Exception $e) {
        echo 'Caught exception: ', $e->getMessage(), "\n";
    }
}
```

Figure 28 Exception Handling using Try Throw and Catch

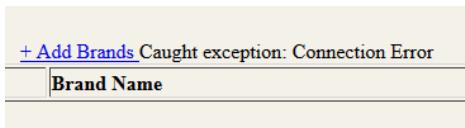


Figure 29 Error Thrown in Try Catch

Database Implementation

Database for the web application is developed using PHP based Phpmyadmin. Phpmyadmin is a standout amongst the most prevalent applications for MySQL databases administration. It is a free device written in PHP. Through this product you can make, change, drop, erase, import and fare MySQL database tables. You can run MySQL questions, streamline, repair and check tables, change gathering and execute other database administration charges.

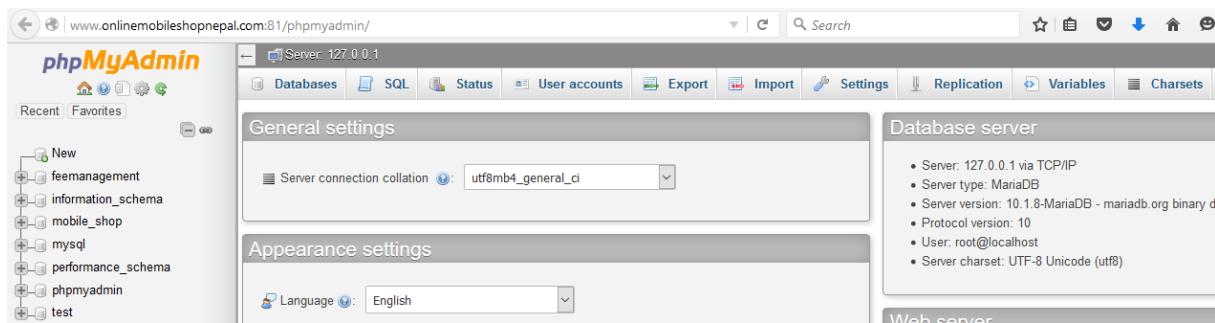


Figure 30 Phpmyadmin

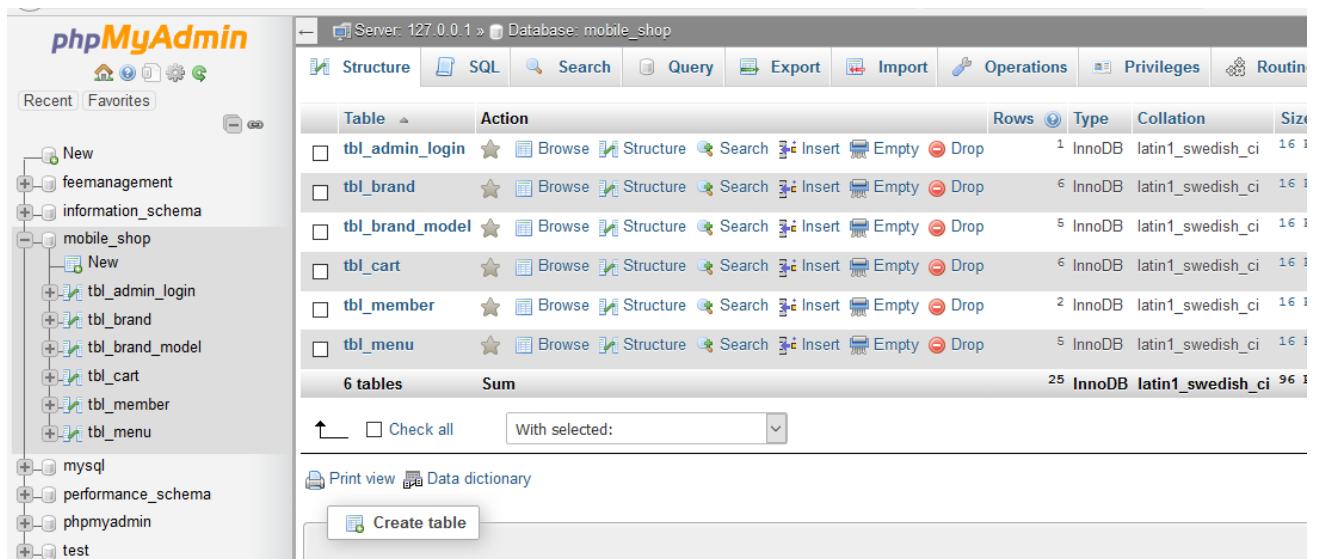


Figure 31 Developed database system using Phpmyadmin

Summary

This paper documented implementation of the online mobile shopping system project. Before conducting implementation, business requirement was reviewed. To properly plan and manage the application development project waterfall SDLC model was chosen. Then scripting languages were implemented to program and achieve those business requirement. Each modules requirement identified by review of business requirement is included in developed system. Now system is developed, before being published for public it should be tested, debugged and well documented.

Task 6

Critically review and test a web application using a web enabled database management system and **analyze** the actual test result against expected result to identify discrepancies. [4.1, 4.2 D1]

Introduction

This paper documents testing of the developed project as well as critically reviews the system. Testing is very important phase of any application development. It helps to find bugs, errors and misconfigurations in the product. Testing would help to reduce issues in the system and improve its quality and performance. As the system is developed using waterfall model, identified issues are addressed before deployment but testing and debugging is done iteratively before business requirement is not achieved. This paper documents results during various tests such as compatibility test, unit test, stress test, and integrate test as test log which is later further analyzed to evaluate overall test results.

Unit Test

Unit test involves testing of small units of the project. For example, links, button clicks, drop down etc. Unit testing must be finished with a mindfulness that it may not be conceivable to test a unit for each info situation that will happen when the project is keep running publicly. Unit testing can be tedious and monotonous. It requests persistence and painstaking quality from the testing/development team. Unit testing carried out on the developed system is documented below.

Date:11/20/2015				
T.N.	What was tested	Expected Output	Actual Output	Test Remarks
1	Navigation Menu Links	Clicking contact menu should open relevant page	contact page opened when contact clicked in menu	OK
Screenshot				

Home	Blog	About	Contact	
GET IN TOUCH				
<input type="text" value="Name"/>		<input type="text" value="Email"/>		
<input type="text" value="Subject"/>				
<input type="text" value="Your Message Here"/>				

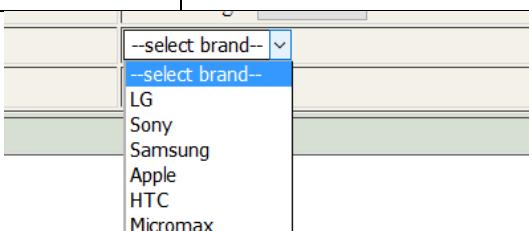
2	Internal Links	Should open relevant module page when clicked link in admin panel	When clicked link for add product, add product page opened	OK
---	----------------	---	--	----

Screenshot	
------------	---

Home Products Brands Members Logout																
<table border="1"> <tr> <td>Model Name</td> <td><input type="text"/></td> </tr> <tr> <td>Price</td> <td><input type="text"/></td> </tr> <tr> <td>Description</td> <td><input type="text"/></td> </tr> <tr> <td>Upload Image</td> <td>Select Image: <input type="button" value="Browse..."/> No file selected.</td> </tr> <tr> <td>Select Brand</td> <td>--select brand--</td> </tr> <tr> <td>Save</td> <td><input type="button"/></td> </tr> </table>					Model Name	<input type="text"/>	Price	<input type="text"/>	Description	<input type="text"/>	Upload Image	Select Image: <input type="button" value="Browse..."/> No file selected.	Select Brand	--select brand--	Save	<input type="button"/>
Model Name	<input type="text"/>															
Price	<input type="text"/>															
Description	<input type="text"/>															
Upload Image	Select Image: <input type="button" value="Browse..."/> No file selected.															
Select Brand	--select brand--															
Save	<input type="button"/>															
Eshop																

3	Drop Down Menu	Should list all brands correctly	Listed down available brands correctly when clicked	OK
---	----------------	----------------------------------	---	----

Screenshot	
------------	---

	
---	--

4	Add to cart	When user click on add to cart, item should be added to cart	Successfully added item in cart when add to cart is clicked	OK
---	-------------	--	---	----

Screenshot	 <p>NPR.50000</p> <p>Iphone 6</p> <p><input type="button" value="Add to cart"/></p>			
 Account Wishlist Checkout Cart(3) Login				
5	Item Detail	Clicking product in left menu should provide detailed information	When clicked item from left menu, detailed information loaded	OK
Screenshot	 <p>SAMSUNG</p> <p>E7 G77 SAMSUNG BLACK220 SAMSUNG 800</p> <p>APPLE</p> <p>CATEGORY</p> <ul style="list-style-type: none"> LG SONY SAMSUNG APPLE HTC MICROMAX <p>FEATURES ITEMS</p> <p>Samsung Black220</p> <p>Android OS, v5.1.1 (Lollipop) CPU Quad-core 1.2 GHz Memory Card slot microSD, up to 128 GB Internal 8 GB, 1.5 GB RAM Camera Primary 8 MP, 3264 x 2448 pixels, autofocus, LED flash Features Geo-tagging, touch focus, face detection Video 1080p@30fps Secondary 5 MP</p>			
6	Login button submit	Should allow to login when login form is submitted with correct credential	Login allowed when button pressed	OK

Screenshot	<p>Login to your account</p> <p>meet_atutgorkhali@yahoo.com</p> <p>••••••••••</p> <p><input type="checkbox"/> Keep me signed in</p> <p>Login</p>
-------------------	---

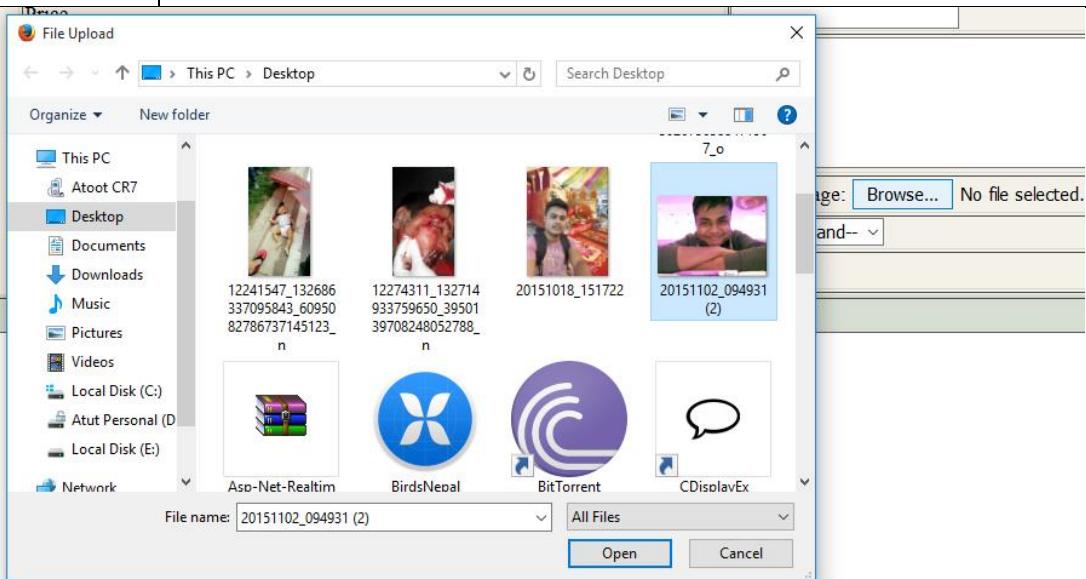


Welcome

meet_atutgorkhali@yahoo.com
[history](#)
[Log out](#)

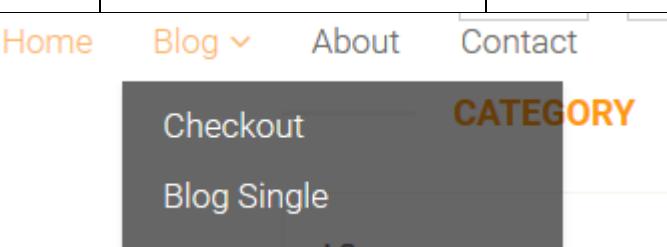
7	Browse File Button	Should allow to browse through files to upload	Allowed to browse and select file when browse button clicked	OK
---	--------------------	--	--	----

Screenshot	<p>Select Image: <input type="button" value="Browse..."/> No file selected.</p>
-------------------	---



8	Logout Button [User]	Should make user logout from the system	Successfully logged out from system	OK
---	----------------------	---	-------------------------------------	----

Screenshot	<p>meet_atutgorkhali@yahoo.com</p> <p>Wishlist</p> <p>Checkout</p> <p>Cart(3)</p> <p>Log Out</p>
-------------------	--

<p style="text-align: right;">Account Wishli:</p> <p>Login to your account</p> <div style="text-align: center; margin-top: 10px;"> OR </div> <div style="background-color: #f0f0f0; padding: 10px; border-radius: 5px;"> <div style="margin-bottom: 10px;"> <input style="width: 100%; height: 30px; border: none; border-bottom: 1px solid #ccc; padding: 5px; font-size: 14px; margin-bottom: 5px;" type="text"/> </div> <div style="border: 1px solid #ccc; width: 100%; height: 30px; border-radius: 5px; background-color: #f0f0f0; position: relative;"> <div style="position: absolute; left: 10px; top: 10px; font-size: 12px; color: #ccc;">Password</div> </div> <div style="margin-top: 10px;"> <input type="checkbox"/> Keep me signed in </div> <div style="text-align: center; margin-top: 10px;"> <input style="background-color: orange; color: white; border: none; padding: 5px 15px; border-radius: 5px; font-weight: bold; font-size: 14px;" type="button" value="Login"/> </div> </div>				
9	Blog page Link	Clicking blog link should open blog page	Error message appeared saying fin object not found	Failed
Screenshot				

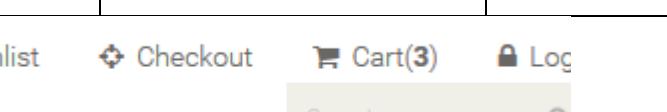
Object not found!

The requested URL was not found on this server. The link on the [referring page](#) seems to be wrong or outdated. Please inform the author of [that page](#) about the error.

If you think this is a server error, please contact the [webmaster](#).

Error 404

www.onlinemobileshopnepal.com
Apache/2.4.17 (Win32) OpenSSL/1.0.2d PHP/5.6.14

10	Cart Link	When clicked in cart, detailed information page [cart page] should load	New cart page with detailed information about current cart loaded when cart link is clicked	OK
Screenshot				

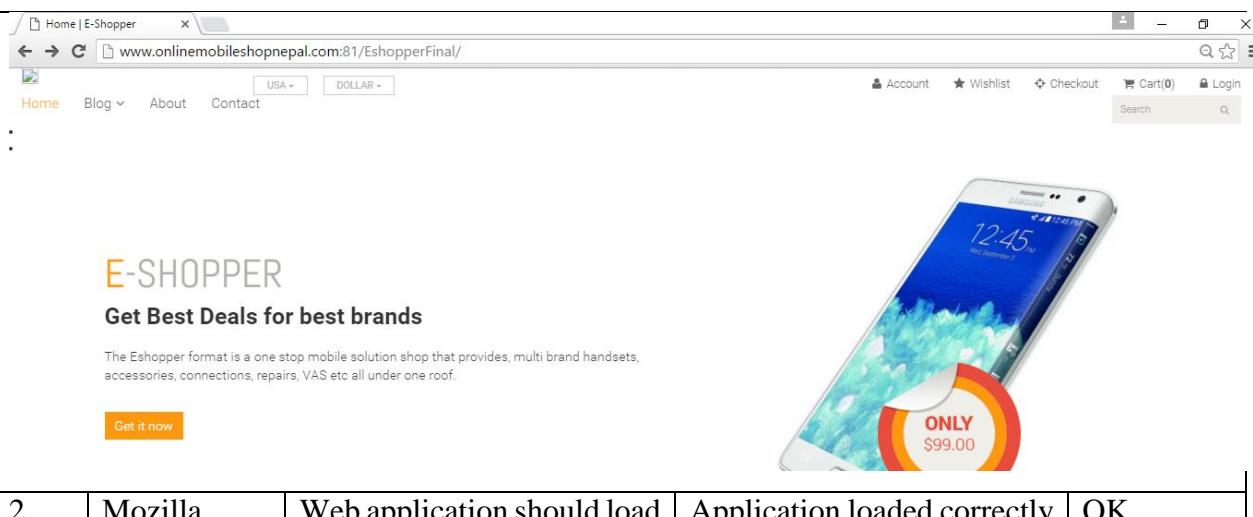
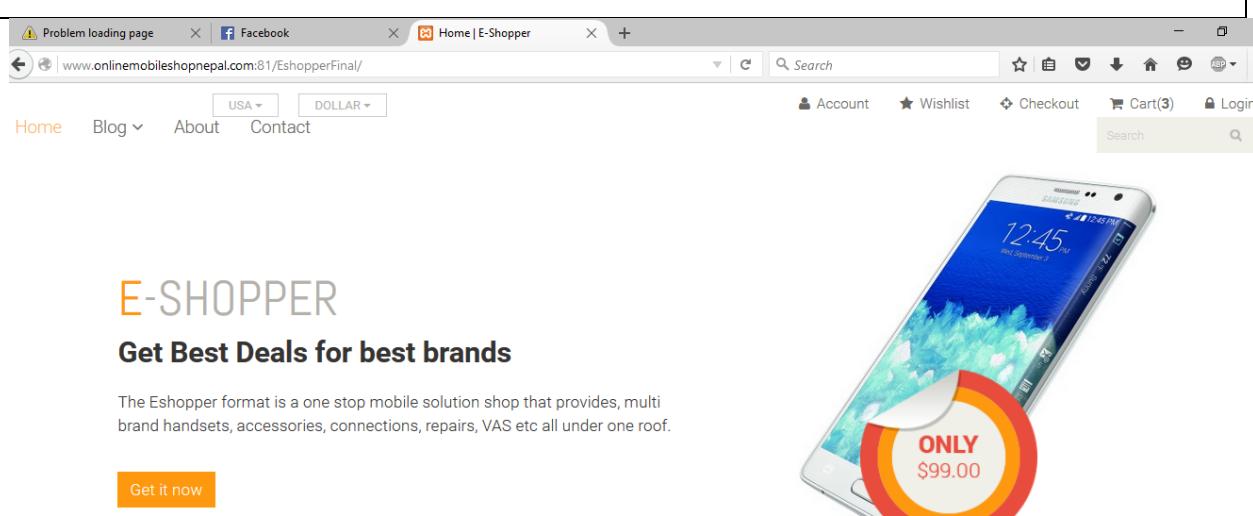
Home > Shopping Cart

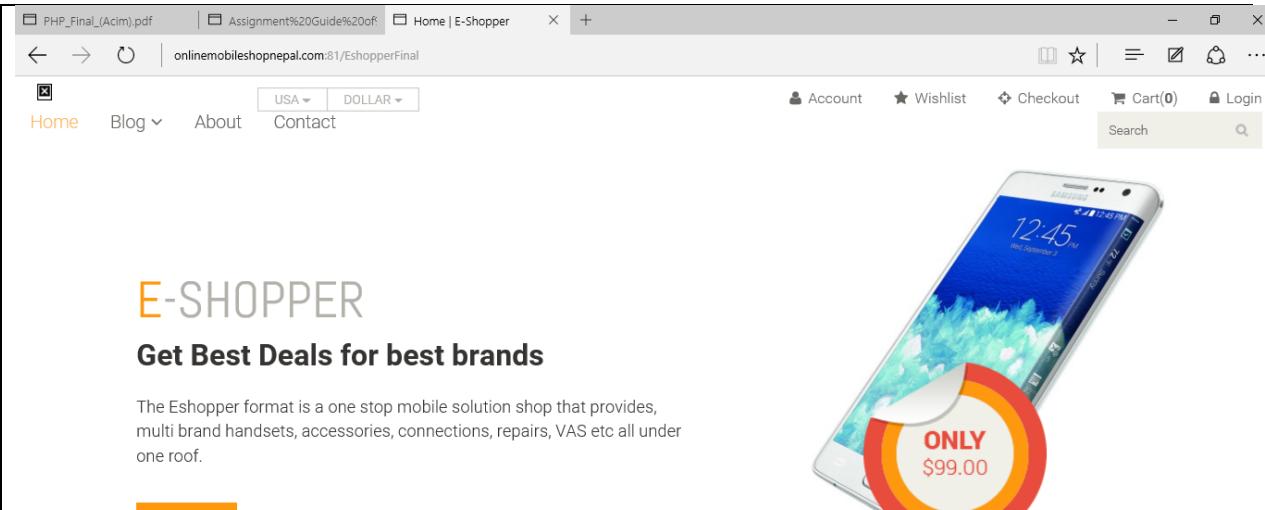
Item	Price	Quantity	Total
 G77 Samsung G77 RAM: 1GB Camera: 5MP Memo... read more	NPR.12000	<input type="text" value="1"/> Delete	
 HTC 620 G 1.7 GHz, octa-core Android OS, v4.4.4 (... read more	NPR.31000	<input type="text" value="0"/> Delete	
 HTC 620 G 1.7 GHz, octa-core Android OS, v4.4.4 (... read more	NPR.31000	<input type="text" value="1"/> Delete	
Total: 43000 Update Cart Checkout			

Compatibility Test

Compatibility testing involves testing of system in various environment. Such as different hardware configuration, different OS, different users etc. Compatibility test results are documented below here.

Date:11/20/2015				
T.N.	What was tested	Expected Output	Actual Output	Test Remarks
1.	Chrome compatibility	Web application should load correctly in chrome browser	Application loaded correctly in chrome browser	OK
Screenshot				

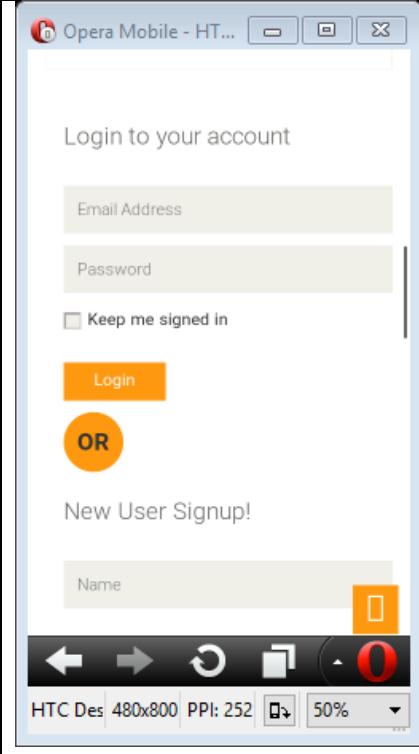
				
2	Mozilla compatibility	Web application should load correctly in chrome browser	Application loaded correctly in chrome browser	OK
Screenshot				
				
3.	Edge compatibility	Web application should load correctly in chrome browser	Application loaded correctly in chrome browser	OK
Screenshot				



The screenshot shows the homepage of the E-SHOPPER website. At the top, there's a navigation bar with links for Home, Blog, About, Contact, Account, Wishlist, Checkout, Cart(0), and Login. A search bar is also present. The main content features a large image of a smartphone displaying a deal: "ONLY \$99.00". Below the phone, there's a banner with the text "Get Best Deals for best brands" and a "Get it now!" button. A descriptive text states: "The Eshopper format is a one stop mobile solution shop that provides, multi brand handsets, accessories, connections, repairs, VAS etc all under one roof." There's also a table below:

4.	Mobile compatibility	Web application should load correctly in mobile browser	Application loaded correctly in mobile browser	OK
----	----------------------	---	--	----

Screenshot

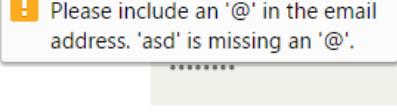


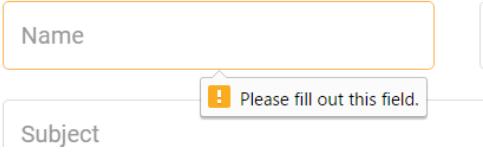
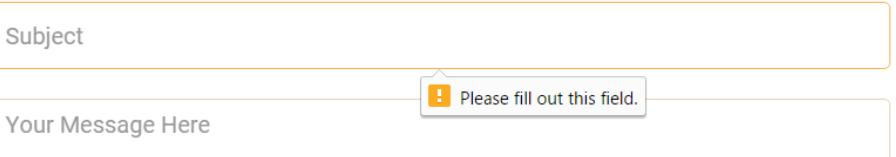
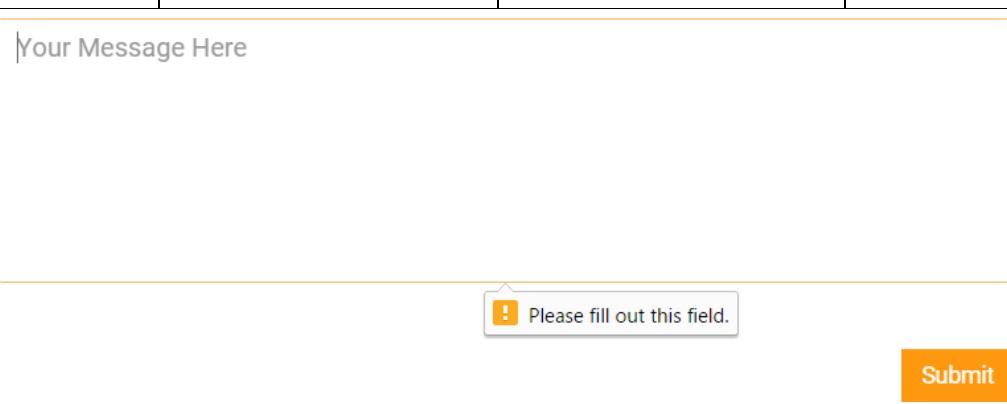
The screenshot shows the Opera Mobile browser interface. It displays two overlapping pages: a "Login to your account" page with fields for Email Address and Password, and a "New User Signup!" page with a Name field. The browser status bar at the bottom indicates "HTC Des 480x800 PPI: 252 50%".

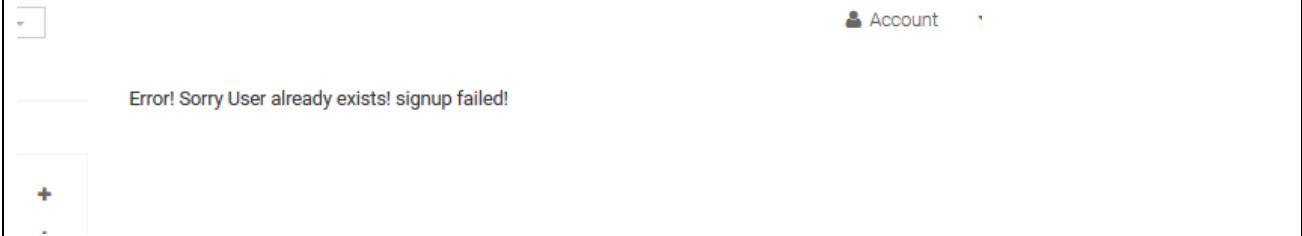
Stress Test

Basically in stress testing, extreme condition of product is tested. In current testing, validation test is done as form of stress testing. Testing results are documented below.

Date:11/20/2015

T.N.	What was tested	Expected Output	Actual Output	Test Remarks
1	Validation: Sign Up [Name]	Should not allow to submit empty field	Gave warning message and blocked submission	Ok
Screenshot		 Enter Name		
2	Validation: Sign Up [Email]	Should require valid email address	Gave warning message when tried to submit invalid email	OK
Screenshot		 Please include an '@' in the email address. 'asd' is missing an '@'.		
3	Validation: Sign Up [Password]	Should require minimum 6 letters and special character	Gave warning message when tried to submit password that does not match requirement	OK
Screenshot		 Password should be of 6 characters		
 password should contain atleast one uppercase letter and one special character				

4	Validation: Contact us [Name]	Should require Name fields filled before submission	Warned and blocked submission while name field was blank	
Screenshot				
5	Validation: Contact us [Email]	Should require email fields filled with valid email before submission	Warned and blocked submission while email field was blank	OK
Screenshot				
6	Validation: Contact us [Subject]	Should warn and block submission when subject is blank	Warned and blocked submission while subject field was blank	OK
Screenshot				
7	Validation: Contact us [Massage]	Should warn and block submission when massage is blank	Submission blocked with warning massage when massage filed was blank	OK
Screenshot				

8	Two user with same Email	Signup using same email twice should be not be allowed	Signup failed while trying to sign up twice using same email	OK
Screenshot				

Integrate Test

Integrate testing tests integration of different modules of the system. Test documentation for integrate testing is provided below.

					Date:11/20/2015																																																	
T.N.	What was tested	Expected Output	Actual Output	Test Remarks																																																		
1.	Database Integration [Retrieve] View product	Should successfully retrieve data from database and load in view product page	Successfully retrieved information	OK																																																		
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[Home](#) | [Products](#) | [Brands](#) | [Members](#) | [Logout](#)

+ Add Products					
Model Name	Model Price	Description	Image	Brand Name	Action
G77	12000	Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB		Samsung	Edit Delete
Iphone 6	50000	11.93 cm (4.7) 2 GB RAM and 16 GB ROM 1.8 GHz Dual Core Processor 12 MP Rear and 5 MP Front...		Apple	Edit Delete
HTC 620 G	31000	1.7 GHz, octa-core Android OS, v4.4.4 (KitKat) 1 GB RAM 8 MP Rear Camera		HTC	Edit Delete

2.	Database Integration [Insert] Add product	Should successfully insert data in database from add product form	Successfully added information	Ok
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Screenshot	Home Products Brands Members Logout												
	<table border="1"> <tr> <td>Model Name</td> <td><input type="text" value="G77"/></td> </tr> <tr> <td>Price</td> <td><input type="text" value="12000"/></td> </tr> <tr> <td>Description</td> <td>Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB</td> </tr> <tr> <td>Upload Image</td> <td> Select Image: <input type="button" value="Browse..."/> No file selected.</td> </tr> <tr> <td>Select Brand</td> <td><input type="button" value="Samsung"/></td> </tr> <tr> <td>Save</td> <td><input type="button" value="Save"/></td> </tr> </table> <p>Eshopper Admin @ 2015</p>	Model Name	<input type="text" value="G77"/>	Price	<input type="text" value="12000"/>	Description	Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB	Upload Image	 Select Image: <input type="button" value="Browse..."/> No file selected.	Select Brand	<input type="button" value="Samsung"/>	Save	<input type="button" value="Save"/>
Model Name	<input type="text" value="G77"/>												
Price	<input type="text" value="12000"/>												
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Upload Image	 Select Image: <input type="button" value="Browse..."/> No file selected.												
Select Brand	<input type="button" value="Samsung"/>												
Save	<input type="button" value="Save"/>												

model_id	model_name	model_price	model_des	model_image	brand_id
20	E7	32	Samsung E7 Model RAM: 2GB Camera: 13MP Memory:....	samsung-galaxy-e7-full-2.jpg	7
21	G77	12000	Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB	index.jpg	7

3.	Database Integration [Modify]	Should successfully modify data in database according to Edit product form	Successfully edited information in database	OK
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Screenshot	Home Products Brands Members Logout  <p>Eshopper Admin @ 2015</p>																																		
model_id	model_name	model_price	model_des	model_image	brand_id																														
20	E77	32	Samsung E77 Model RAM: 2GB Camera: 13MP Memory...	samsung-galaxy-e7-full-2.jpg	7																														
4.	Database Integration [Delete]	Should successfully delete data from database on admin request			Successfully delete information from database																														
Screenshot	<table border="1"> <thead> <tr> <th>model_id</th><th>model_name</th><th>model_price</th><th>model_des</th><th>model_image</th><th>brand_id</th></tr> </thead> <tbody> <tr> <td>20</td><td>E77</td><td>32</td><td>Samsung E77 Model RAM: 2GB Camera: 13MP Memory...</td><td>samsung-galaxy-e7-full-2.jpg</td><td>7</td></tr> <tr> <td>21</td><td>G77</td><td>12000</td><td>Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB</td><td>index.jpg</td><td>7</td></tr> <tr> <td>22</td><td>Iphone 6</td><td>50000</td><td>11.93 cm (4.7) 2 GB RAM and 16 GB ROM 1.8 GHz Du...</td><td>iPhone-6s-16GB-SDL771687537-1-634d1.jpg</td><td>8</td></tr> <tr> <td>23</td><td>HTC 620 G</td><td>31000</td><td>1.7 GHz, octa-core Android OS, v4.4.4 (KitKat) 1...</td><td>htc1-d61b1.jpg</td><td>9</td></tr> </tbody> </table>					model_id	model_name	model_price	model_des	model_image	brand_id	20	E77	32	Samsung E77 Model RAM: 2GB Camera: 13MP Memory...	samsung-galaxy-e7-full-2.jpg	7	21	G77	12000	Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB	index.jpg	7	22	Iphone 6	50000	11.93 cm (4.7) 2 GB RAM and 16 GB ROM 1.8 GHz Du...	iPhone-6s-16GB-SDL771687537-1-634d1.jpg	8	23	HTC 620 G	31000	1.7 GHz, octa-core Android OS, v4.4.4 (KitKat) 1...	htc1-d61b1.jpg	9
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5	Database Integration [Retrieve] [Product Info]	Should successfully load data from database and display in featured items			Successful retrieved data from database																														
Screenshot																																			

FEATURES ITEMS



NPR.12000
G77

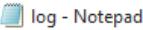


NPR.50000
Iphone 6



NPR.31000
HTC 620 G

6	Database Integration [Insert]	Should store user information in database after successful signup	Stored member information in database	OK																								
Screenshot																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>member_id</th> <th>member_name</th> <th>member_phone</th> <th>member_address</th> <th>member_image</th> <th>member_email</th> <th>member_password</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>Atut Gorkhali</td> <td>2147483647</td> <td>Kathmandu</td> <td>20151018_151722.jpg</td> <td>meet_atugorkhali@yahoo.com</td> <td>9546368a81dea9bfda8218b5873c4a</td> </tr> </tbody> </table>					member_id	member_name	member_phone	member_address	member_image	member_email	member_password	2	Atut Gorkhali	2147483647	Kathmandu	20151018_151722.jpg	meet_atugorkhali@yahoo.com	9546368a81dea9bfda8218b5873c4a										
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7	Database Integration: Content Info	Should load Content data from database	Successfully loaded content information from database	OK																								
Screenshot		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #f2f2f2;">id</th> <th style="background-color: #f2f2f2;">title</th> <th style="background-color: #f2f2f2;">detail</th> <th style="background-color: #f2f2f2;">created</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Home</td> <td>This is a home page.</td> <td>2014-12-26 09:23:56</td> </tr> <tr> <td>2</td> <td>Featured Items</td> <td>This is a shopping page.</td> <td>2014-12-26 09:23:56</td> </tr> <tr> <td>3</td> <td>About</td> <td>Here at Mobiles.co.uk we offer some of the very be...</td> <td>2015-12-04 00:13:24</td> </tr> <tr> <td>4</td> <td>Blog</td> <td>Free delivery With recorded delivery 1 hour t...</td> <td>2015-12-04 00:14:12</td> </tr> <tr> <td>5</td> <td>Contact</td> <td>Customer Service Customer Care Center</td> <td>2015-12-04 00:15:10</td> </tr> </tbody> </table>			id	title	detail	created	1	Home	This is a home page.	2014-12-26 09:23:56	2	Featured Items	This is a shopping page.	2014-12-26 09:23:56	3	About	Here at Mobiles.co.uk we offer some of the very be...	2015-12-04 00:13:24	4	Blog	Free delivery With recorded delivery 1 hour t...	2015-12-04 00:14:12	5	Contact	Customer Service Customer Care Center	2015-12-04 00:15:10
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CATEGORY		About		
LG	+	<p>Here at Mobiles.co.uk we offer some of the very best mobile phone deals in the market, whether you're looking for a contract, upgrade or pay-as-you-go offer for your next phone. With over 19 years' experience, Mobiles.co.uk is the UK's first and longest-running online mobile phone shop and today we still offer the same level of customer care we always have, ensuring that our range of cheap mobile phones is as impressive as always. Everything about our business is tailored to our customers, from the regular offers available on phones - like our incredible cashback deals and free gifts - to the speed of service and delivery, ensuring every moment you spend with us is as easy as possible. We use our smartphone expertise to ensure we always have the best new handsets and accessories on the market for you, and keep our fingers on the pulse to provide the latest smartphone news - so you can choose a mobile that's right for your lifestyle! Take a look at our fantastic offers across our website, or feel free to use our fantastic customer help centre to answer any questions you might have. We love phones as much as you do and are dedicated to making sure you receive a fantastic offer and the best customer service in the business! Mobiles.co.uk is rated 4.50 stars by our customers based on 2161 reviews</p>		
8.	Text File Integration	Should write error log in text file	Successfully wrote log in text file	OK
Screenshot		 <p>log - Notepad</p> <p>File Edit Format View Help</p> <pre>
2015-04-16 09:35:28Error Content
2015-04-16 09:35:29Error Content
2015-04-16 09:35:31Error Content
2015-04-16 09:35:32Error Content
2015-04-16 09:35:35Error Content 2015-04-16 09:36:02Error Content 2015-04-16 09:36:04Error Content 2015-04-16 09:36:05Error Content</pre>		

Test Evaluation

During testing of the system, various techniques utilized. Unit test for the system included link test, button click test, module test, browse test, dropdown button test. Test results were analyzed with expected outputs. Test shows all units are working normally, except for blog link. While testing blog link, it showed error. Required page would not load when blog link is clicked. This can happen if file is replaced renamed or HTML tag has wrong file location.

Compatibility testing of the system included web application testing on various famous browsers. Mozilla, chrome, Microsoft's new Edge and even mobile browser were used for testing. All tests showed positive result. This mean system is compatible with all major browsers as well as compatible with mobile browsers. Stress testing involved validation testing, which showed forms are well validated. And finally integrate test was conducted on system to test integration with database and Log file. Test showed application is integrated well to perform various tasks on database and files. After addressing the issues found during tests, testing should be repeated. It is recommended to conduct test in more depth to find any possible issue in the system.

Critical Review

Introduction

Online mobile shopping business is rapidly getting popularity and is ever growing. The main purpose of this system is to understand concept of web application development. This project designs, develop and test the developed product. The e-commerce site is developed using PHP programming language. The project gives users ability to explore mobile products and purchase them online.

Body

Developed system has two core modules. Administrator module is responsible for handling users, brands and products. Admin user need to login the system to have access to each management system. He/she can maintain information using single dashboard (admin panel). On the other hand general user access home page when web application is first loaded. This page consists of navigation menus, cart info, login link, featured items and mobile's categories based on brand. User has ability to view items, add item to cart and purchase them. Additionally, they are able to signup, login the system, and send message to support using contact us form. All these modules of the system is designed and implemented based on the business requirement of the system.

Developed system has modern UI design for users and basic designs for admin panel. These UI layouts are first designed using graphical tool then Front End system was developed using HTML, CSS and JavaScript client side scripting language. Back End of the system is developed using core PHP. Database for the system is developed in MySQL. System is critically tested and it is found compatible with all major web browsers as well as mobile browsers. Similarly, test showed all modules are integrated well and forms are well validated. Which enhances the security of the application by filtering user input. Following positive and negative of the system is noted during reviewing of the system:

Positive

1. Interactive and modern UI design
2. System is thoroughly tested and analyzed
3. Satisfies business requirements
4. Authentication system
5. Proper validation of forms
6. Proper database system is designed and applied

Limitations

1. Test results shows not all links, are configured properly
2. Order cancellation module is absent from the project
3. Wish list mechanism is missing from the system

Conclusion

The developed system is able to satisfy business requirement of the system and serve the core purpose of the project which is to allow to understand concept of web application development. Project has successfully implemented front end as well as back end. Various types of users are taken into consideration while developing system for example, as admin users are expert level users, management modules are designed thinking about them. Similarly, general users can be anyone hence, Home page is designed to have simple yet interactive looks. System has implemented contact us form to support occasional and novice users. Review of the system describes some of the positive as well as negative aspects of the system. Limitations of the system should be addressed. And finally, as the system is tested and review, feedback from other should be taken to evaluate the system in more depth.

Task 7

Critically evaluate independent feedback on a developed web application and make recommendation for improvement [4.3, D3]

Feedback

Feedback system is process of getting reaction from other on a specific topic. To properly evaluate the developed system, solution was provided to Mr. Nabin Kumar Singh to provide feedback for the system. Feedback report return by Mr. Singh and feedback evaluation along with future recommendations is attached below here.

Independent Feedback	
Project Title: Online Mobile Shopping System [Web Application]	
Feedback Given By: Mr. Nabin Kumar Singh	Signature: Date:
Project Description: Online mobile shopping is fast increasing commercial platform. This project analyzes, design, implement and test web based mobile shopping system to take advantage of this growing platform. Various tools and technologies are utilized to design and implement web application. This project studies architecture of online shopping to understand concept of web application development.	
Important Features of the Project	Some of the key feature of project identified during feedback are as follows: 1. This project has separate modules for clients and administrator 2. Brand management 3. Product Management 4. Member Management 5. Purchase system 6. Cart System 7. Query and Support through contact us page 8. Member/Admin login system

Checklists	YES	NO	Comment
Have business requirements been defined and are they clear?	Yes		Business requirements are clearly defined
Have Front End and Back End of the system has been designed?	Yes		Both front end and back end is designed
Does the system has been implemented in align with the proper design?	Yes		Front End design is based on the layout designed using graphical tool
Have been critically tested and reviewed the system or not?	Yes		Various tests conducted on the system including unit/stress/compatibility,
Does the system fulfill the requirements of the clients?	Yes		Product has address all business requirement hence solves client requirement
Have developed the onscreen help form to assists the user of the computer program?	Yes		Technical and non-technical guideline is prepared to ease the user
Has Security measurements are taken into consideration during development?	Yes		Various methods are implemented to improve security
Has database system for project is designed?	Yes		Database system is designed using schema diagram and developed using Phpmyadmin
Does system has modern admin Dashboard UI?		No	Modern dashboard is absent from the project as it has basic UI
Does system has modern UI?	Yes		UI for Users pages has Modern looks
Significance of the Project	<p>While reviewing the system, following significance were noted:</p> <ol style="list-style-type: none"> 1. Web application has home page that allows access to various different pages such as blogs, about, contacts etc. 2. Application has Blog feature that will offer news about latest products, discounts etc. 3. User interface for clients is interactive and modern to attract visitors 		

	<ul style="list-style-type: none"> 4. Users can get detailed information about item they are interested 5. Application has contact us page to provide assistance to clients 6. System has authentication system, members are required to login first before purchasing a product. Admin requires to login to access admin panel.
Project Limitation	<p>While reviewing the system, following limitations were noted:</p> <ul style="list-style-type: none"> 1. System has absence of modern admin dashboard 2. System has client side validation but does not have server side validation 3. Current database system does not support more than one image for one item 4. System is developed using core PHP which requires developer to write all codes him/herself.

Feedback Evaluation

Feedback Evaluated By:	Signature:
Mr. Atut Gorkhali	Date:

Evaluation of the System:

Feedback is evaluated in terms of design, coding structure, security and database design.

Design

Developed system utilizes HTML, CSS and JavaScript to design front end of the system. System has utilized various interactive components such as slide animation in navigation menu while developing system. These components gives modern looks to the front end. Additionally, home page is designed in such way to provide easy access to various other module of the system. While studying the feedback, it is understood that UI design for admin panel is not up to the mark as compared to user home page. Admin panel is very system and does not have any interactive components other than links and forms.

Security

It is never a good idea to have only client side validation for web application. As client can easily disable client side scripting in browses, such validation is not trust worthy. Solution uses PHP

as server side scripting, but has failed to implement server side validation. Which needs to be addressed as soon as possible.

Coding Architecture

Given system is developed using implementation of PHP as server side scripting tool. PHP used in system is core PHP. This means all libraries, classes, methods are required to be written by programmer himself. This means performance and security of the system solely depends on the quality of developer and additionally, development period is longer as he/she has to do everything herself. Though core PHP is great tool itself, alternative solution can be considered for more secure and effective solution.

Database Design

Database for the system is designed after proper planning. Database for the web application allows to store, retrieve and manipulate data about brands, products, members, carts etc. Database system is able to satisfy business requirement of the system. But while studying feedback form, it is evaluated that database is unable to store more than one image of item. It is worth mentioning that business requirement of the system is to display product to customer. This means having more than one picture of item can be beneficial while introducing item to customer. Which current database system is failed to satisfy.

Recommendations for future consideration:

User PHP Framework

It is recommended to implement PHP framework for the system instead of core PHP. One of the key benefit of using PHP framework over core PHP is it offers great security. Most of the framework comes with input filtering mechanism for SQL injection and XSS injection. Other benefits of PHP framework is it comes with libraries which can be used allowing developer to reuse code instead of writing themselves.

Use Modern UI templates for Dashboard

It is recommended to utilize latest technology to improve quality of admin dashboard (panel). There are plenty of free dashboard template available in market that can be utilized for the system. Designer can him/herself modern design dashboard for the system by taking idea from such free dashboards. These modern dashboards provides eye catching UI design, effective data

management, and effective management of the various modules in the system. Furthermore, these Dashboard has ability to showcase status of products, graph reports etc. one of the example of modern dashboard than can be considered for online mobile system is suggested below.

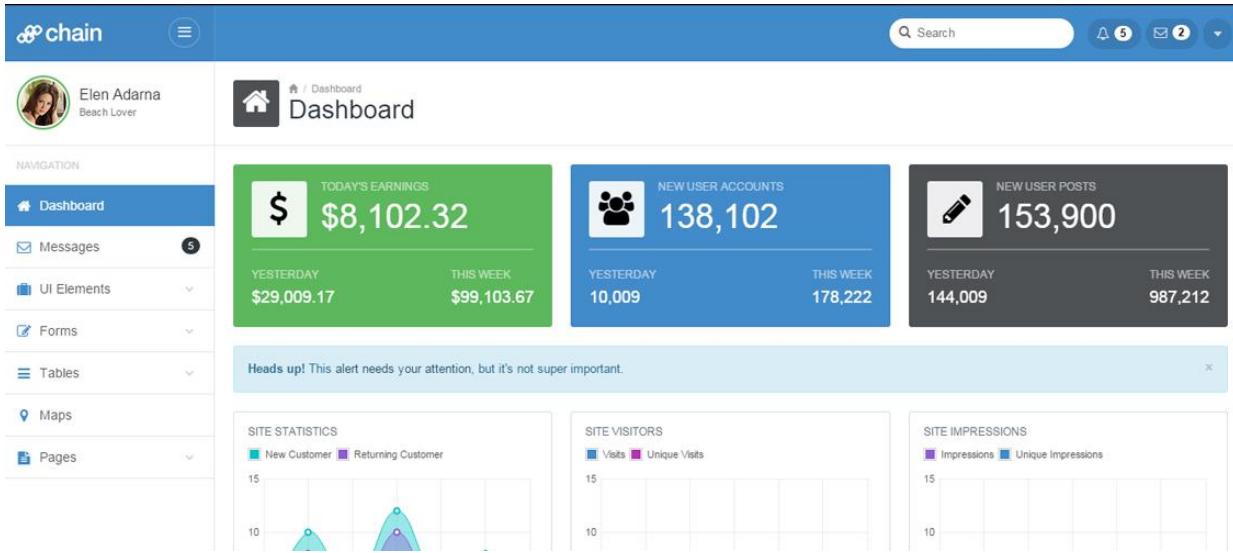


Figure 32Modern Dashboard UI

Add Image Table

As the ability of database to store more than one image for item can beneficial it is recommended to add such mechanism to database. For that, image1, image2 column can be added to current product table. Alternatively, new table can be created for images and relationship between that image table and product table can be created. This would enable item to have more than 1 image.

Task 8

Create documentation for a web developed application [4.4, M3]

Technical Documentation

This document provides technical guideline about the developed Online Mobile Shopping system. Guideline includes project introduction, its background, utilized tools and technologies, database and front end design, client side and server side scripting, test and task breakdown plan etc. Reader will be able to understand technical aspect of the system.

Introduction

Online Mobile Shopping project is popular business in the world. User visit web application to explore available mobiles and purchase them. This project allows to understand the concept of web development using development of mobile shopping system.

Purpose

The purpose of this project is to develop web application that can satisfy business requirement and understand design, plan, implementation and testing of web applications.

Business requirements

Following problems were identified during business requirement identification.

- System should have two modules for Admin and Clients
- Home page should allow navigation to other pages such as contact us, about us and blogs
- Administrator should be able login to system to manage products, members and brands
- Clients (users) able to view product, add item to cart, purchase item, sign up and login

Tools and Technologies

System Designing Tools

While planning and designing system, various tools and technologies were utilized such as schema diagram and use case diagram. Use case diagram was utilized to understand potential actors of the system and their relation with different use cases. This allowed to understand overview of the system. Additionally, Schema diagram was prepared to study various database objects, their relationship and object attributes.

Photoshop

To design UI Layout of the system, graphical tool like Photoshop is used in the project.

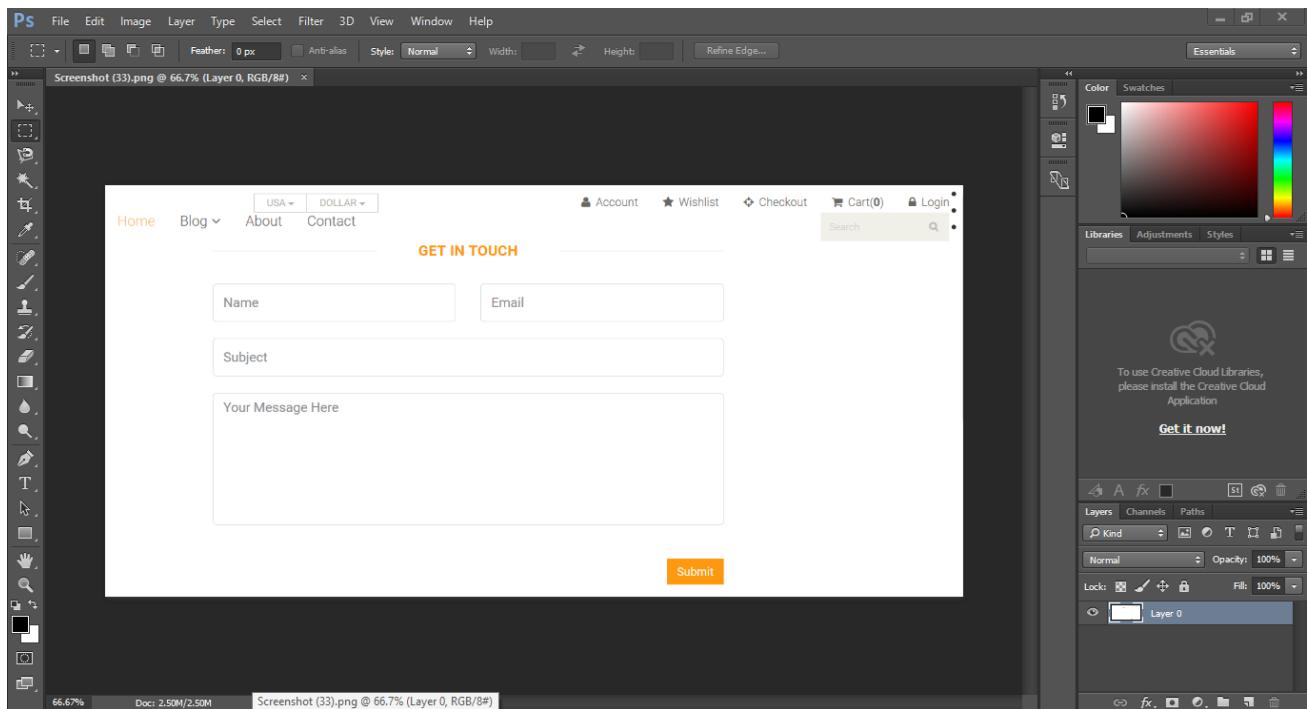


Figure 33 UI design using Photoshop

Dreamweaver

Dreamweaver is a great tool that allows to manage web pages, scripting files, and maintain website. This tool is utilized while implementing web application.

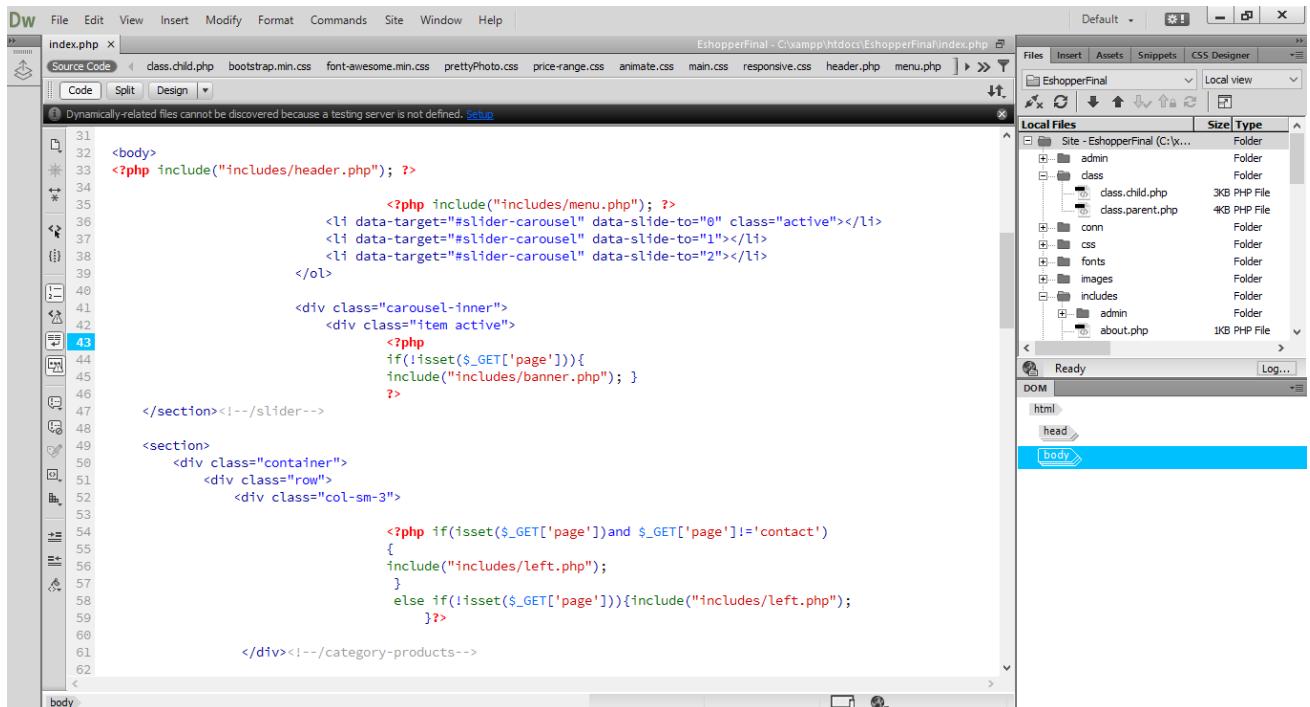


Figure 34 Dreamweaver

Database for the system

Phpmyadmin is utilized to design MySQL database system for the system. Database is implemented according to findings in schema diagram.

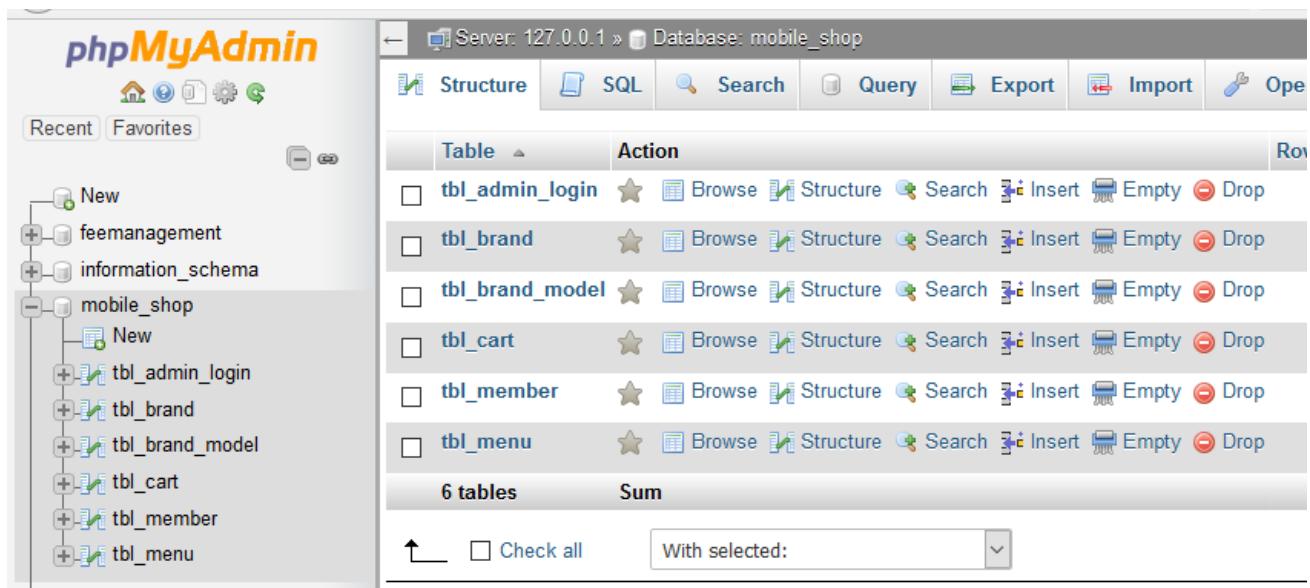


Figure 35 Database Design using Phpmyadmin

Front End Design

To design front End for the online mobile shopping system, technologies such as HTML, CSS and JavaScript is utilized.

HTML

HTML is used in system to establish foundation of web pages for the web application.

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Home | E-Shopper</title>
    <link href="css/bootstrap.min.css" rel="stylesheet">
    <link href="css/font-awesome.min.css" rel="stylesheet">
    <link href="css/prettyPhoto.css" rel="stylesheet">
    <link href="css/price-range.css" rel="stylesheet">
    <link href="css/animate.css" rel="stylesheet">
    <link href="css/main.css" rel="stylesheet">
    <link href="css/responsive.css" rel="stylesheet">
    <!--[if lt IE 9]>
    <script src="js/html5shiv.js"></script>
    <script src="js/respond.min.js"></script>
    <![endif]-->
    <link rel="shortcut icon" href="images/ico/favicon.ico">
    <link rel="apple-touch-icon-precomposed" sizes="144x144" href="images/ico/apple-touch-icon-144-precomposed.pr...
```

Figure 36 HTML Tags

CSS

CSS is utilized to design presentation of the system. CSS codes are managed in main.css file of CS directory.

```
'h1, h2, h3, h4, h5, h6 {
    font-family: 'Roboto', sans-serif;
}

.btn:hover,
.btn:focus{
    outline: none;
    box-shadow: none;
}

.navbar-toggle {
    background-color: #000;
}

a#scrollUp {
    bottom: 0px;
    right: 10px;
    padding: 5px 10px;
```

Figure 37 CSS

Client Side Scripting

JavaScript

Developed system utilizes client side scripting for validation and delete confirmation.

```
if (confirm('Are you sure want to delete this product?'))
{
    return true;
}
else{
    return false;
}
```

Figure 38

Are you sure to delete this brand?



Figure 39 Delete Confirmation using JavaScript

Server Side Scripting

Web application is developed using server side scripting language. Current system uses PHP languages as scripting language for the system. PHP is free-open source language that is very popular due to its cross platform ability.

PHP

```
<?php

$sql=$obj->view_products();
while($row=mysql_fetch_array($sql)){
?>
<tr>
<td><?php echo $row[1] ?></td>
<td><?php echo $row[2] ?></td>
<td><?php echo $row[4] ?></td>
<td></td>
<td><?php echo $row[5] ?></td>
<td><a href = "home.php?page=edit_product&id=<?php echo $row[0] ?>">Edit </a> | <a onclick="return validate()" href="home.php?page=del_products&id=<?php echo $row[0] ?>"> Delete </a></td>
</tr>

<?php } ?>
</table>
```

Figure 40

Test Plan

Following test log template is utilized while documenting the test of the system. As testing is essential to any system, test documentation allows to analyze the result to find problems in the system and medicate them.

Date: Test Date				
T.N.	What was tested	Expected Output	Actual Output	Test Remarks
1.	Test Description	Expected output from test	Test Output	Test ok or failed
Screenshot 1				
Screenshot 2				

Gantt chart

Gantt chart is prepared for the project to plan schedule and task of the system development project. It includes task breakdown, allocated time for each task, total time etc. Reader will get information about various stages of project and time taken by those stages. Gantt chart for the system is prepared below.

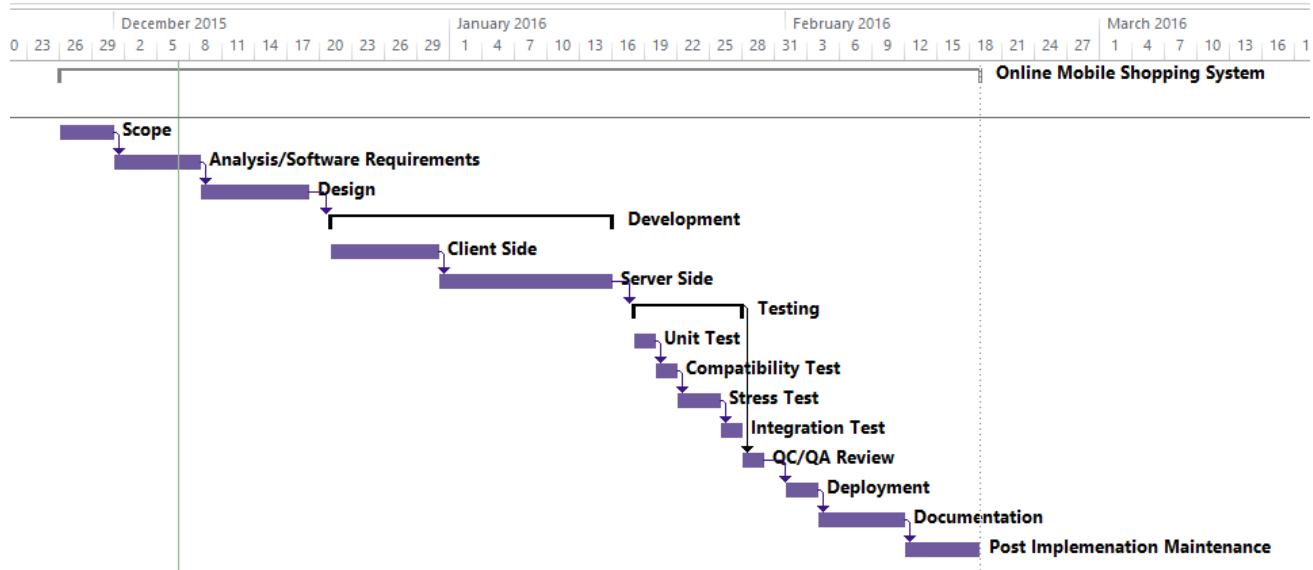


Figure 41 Gantt chart for developed system

Deployment

Getting Domain Name

To get proper domain name, domain selling site GoDaddy is used. Suitable domain name is purchased for the site.

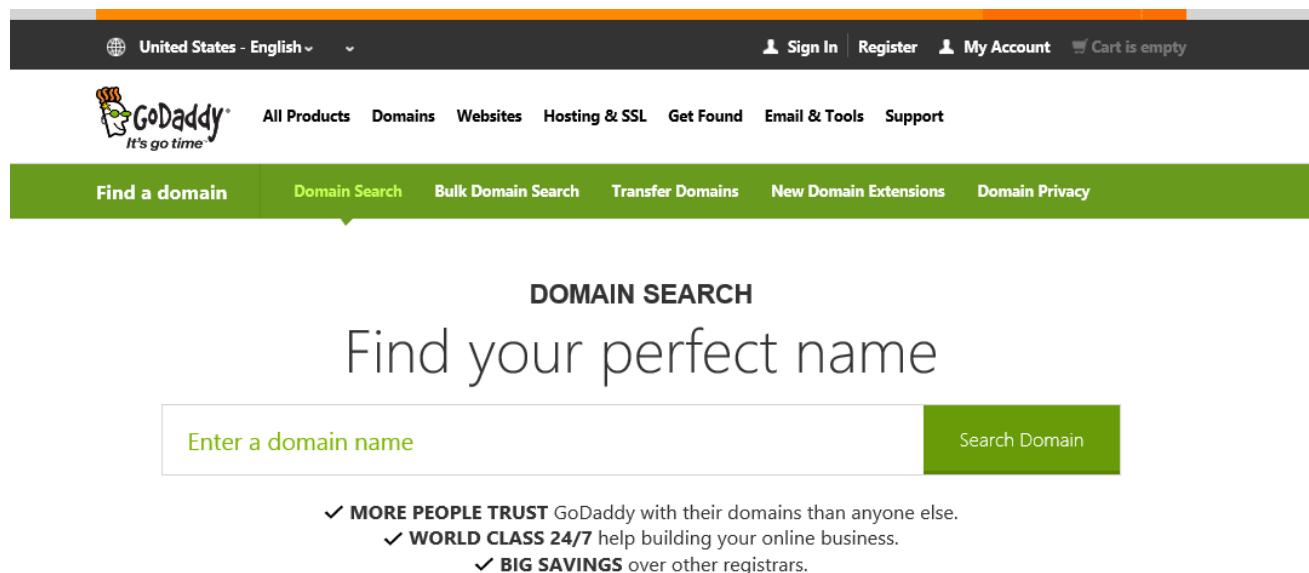


Figure 42

Getting Hosting space

Generally, domain seller also provides hosting service, suitable package should be brought to host web application.

Upload/publish

To publish web application, download FTP client and login to hosting server using credentials [Figure11]. Once you are logged in upload files and folders [figure 12]→ this is all required to host a web application.

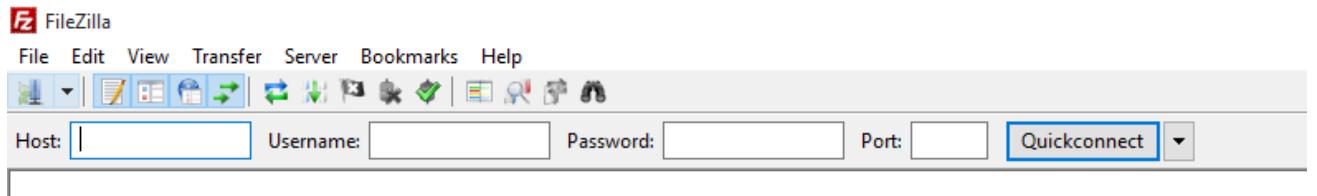


Figure 43

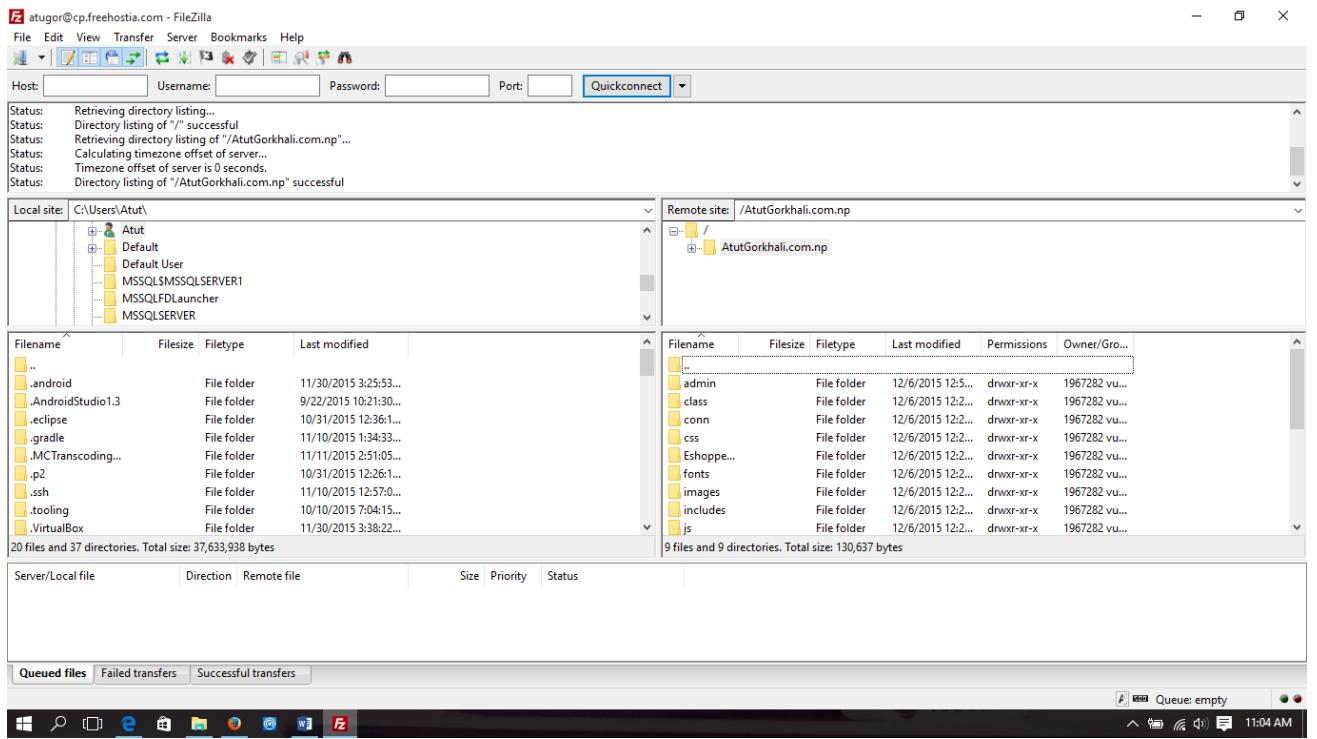


Figure 44

Non-Technical Documentation

Introduction

This documentation offers non-technical support to the users of the developed online mobile shopping system web application. Reader will get information about how to use various modules in the system. For effective guidance, this document is categorized into Support for administrator and support for client users.

Administrative Support

This section of the manual would help administrators while using admin panel.

Accessing Admin Page

To access the admin section use \admin after actual domain of the web application. [Figure 11]

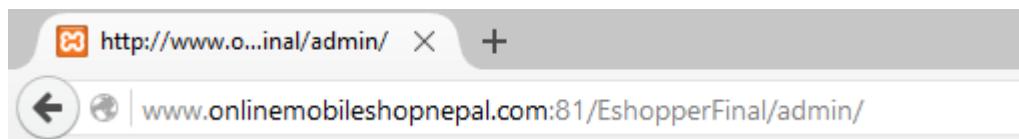


Figure 45 Accessing to Admin Panel

Login

- After loading admin page, in login form [figure 12] provide valid username and password.
- After successfully login into the system, Admin panel will load [figure 13]

 A screenshot of a login form. It has two input fields: "Username" containing "admin" and "Password" containing five black dots. Below the fields is a large grey "Login" button.

Figure 46 Login

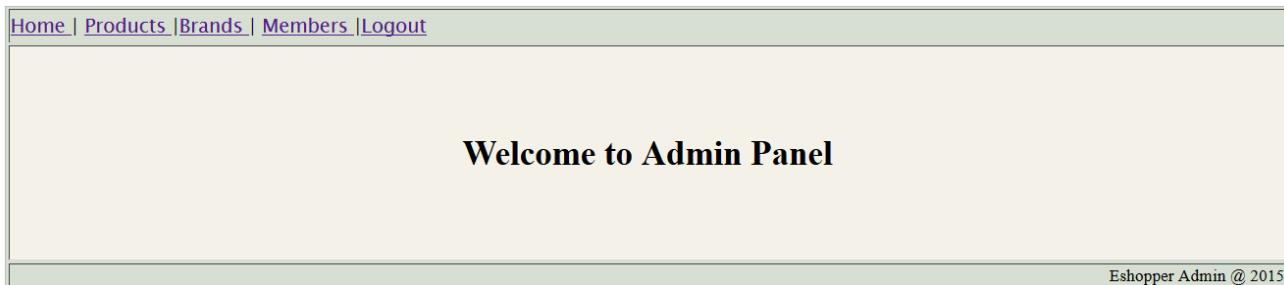


Figure 47 Admin Panel

Brand Management

- Login to Admin panel [If you have any problem use guideline for access and login admin panel]
- To access brand management module, click on Brands from navigation [figure 14]

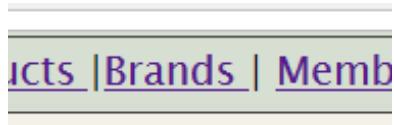


Figure 48 Brand Management Menu

Home Products Brands Members Logout			
+ Add Brands	Brand ID	Brand Name	Action
	4	LG	Edit Delete
	6	Sony	Edit Delete
	7	Samsung	Edit Delete
	8	Apple	Edit Delete
	9	HTC	Edit Delete
	11	Micromax	Edit Delete

Figure 49 Brand Management page

Add Brand

- To add brand first visit brand management page
- From top left corner add + Add Brand [figure 16]
- In add brand page [figure 17] provide brand name and click save. → Done



Figure 50 Add Brand

Model Name	Micromax
<input type="button" value="Save"/>	

Figure 51 Add brand Page

Modify Brand

- To modify a brand first visit brand management page
- From right side of the brand click on Edit link [Figure 19]

- Provide required modification and save → Done

	Brand Name	Action
	LG	Edit Delete
	Samsung	Edit Delete

Figure 52 Edit Brand

Delete Brand

- To delete a brand first visit brand management page
- Then click on delete button corresponding with brand to be deleted [figure 19]
- Confirm delete in confirmation page → Done

	Sony	Edit Delete
	Samsung	Edit Delete

Figure 53 Delete Brand

Are you sure to delete this brand?



Figure 54 Confirm delete

Product Management

- To access product management module, click on product from navigation [figure 21]



Figure 55 Product management menu

Home Products Brands Members Logout					
Model Name	Model Price	Description	Image	Brand Name	Action
G77	12000	Samsung G77 RAM: 1GB Camera: 5MP Memory: 4GB		Samsung	Edit Delete
Iphone 6	50000	14.93 cm (4.7) 2 GB RAM and 16 GB ROM 1.8 GHz Dual Core Processor 12 MP Rear and 5 MP Front...		Apple	Edit Delete
HTC 620 G	31000	1.7 GHz, octa-core Android OS, v4.4.4 (KitKat) 1 GB RAM 8 MP Rear Camera		HTC	Edit Delete

Figure 56 Product Management Page

Add Product

- To add new product first visit product management page
- From top right corner add + Add Product [figure 23]
- In add product page [figure 24] provide required information then click on save → Done



Figure 57 Add Product

Price	
Description	
Upload Image	Select Image: <input type="button" value="Browse..."/> No file selected.
Select Brand	--select brand-- <input type="button" value="▼"/>
<input type="button" value="Save"/>	

Figure 58 Add product Page

Modify Product

- To modify a product first visit product management page
- From right side of the product, click on Edit link [Figure 25]
- Provide required modification [Figure 26] and save → Done



Figure 59 Edit Product

Description	Camera: 5MP Memory: 4GB
Upload Image	 Select Image: Browse... No file selected.
Select Brand	Samsung
<input type="button" value="Save"/>	

Figure 60 Edit Product Page

Delete Product

- To delete a product first visit product management page
- Then click on delete button corresponding with product to be deleted [figure 27]
- Confirm delete in confirmation page[figure28] → Done

	Name	
Samsung	Edit Delete	

Figure 61 Delete Product

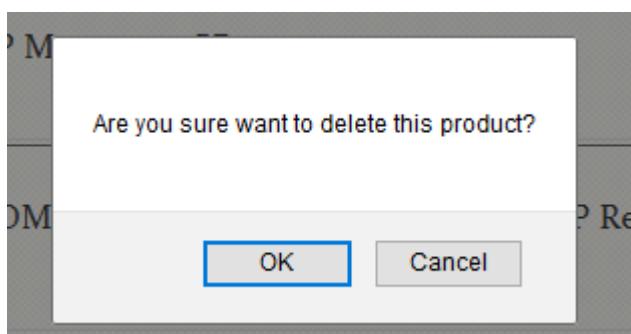


Figure 62 Confirm Delete

Member Management

- To access member management module, click on member from navigation [figure 29]

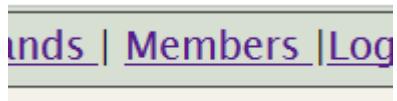


Figure 63

Member Name	Phone	Address	Email	
Atut Gorkhali	2147483647	Kathmandu	meet_atutgorkhali@yahoo.com	Send Email Delete

Figure 64

Delete Member

- To delete a member first visit member management page
- Then click on delete button corresponding with member to be deleted [figure 31]
- Confirm delete in confirmation page [figure 32] → Done



Figure 65

Are you sure want to delete member?



Figure 66

Logout

- To logout from the admin panel click on logout from navigation menu. [Figure 33]



Figure 67 Logout system

General user/client Support

Accessing Application

To access the Home section use provided domain name in browser [Figure 34].

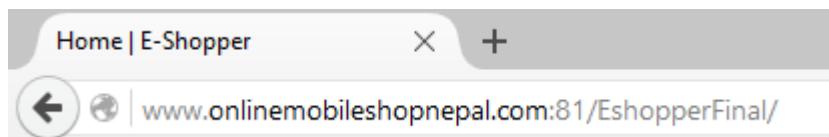


Figure 68 Accessing Web application

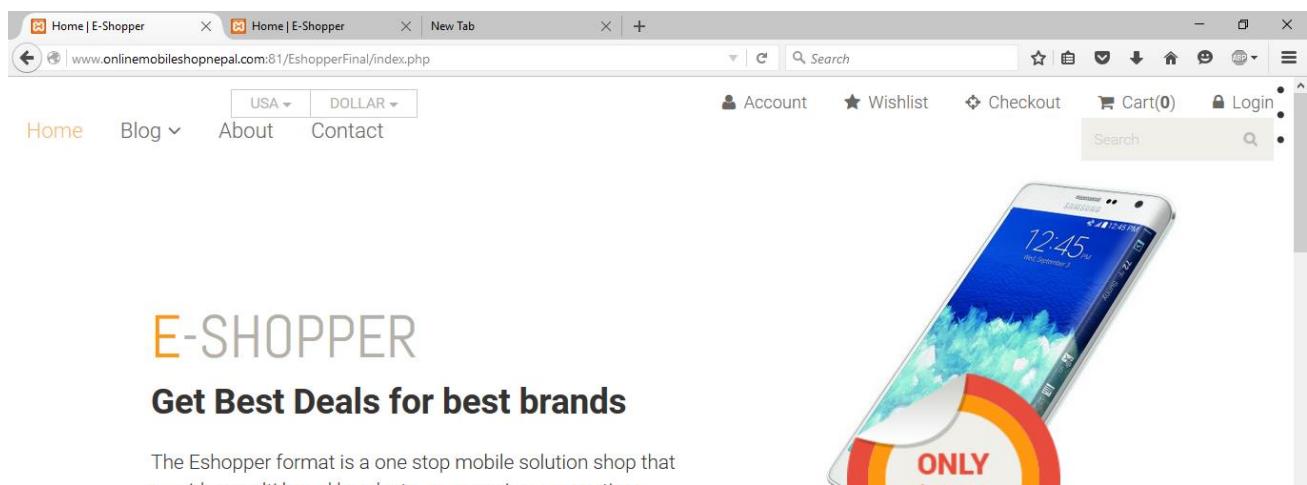


Figure 69 Web application

Navigation through Pages

- Click on navigation menu to open corresponding pages [figure 36]



Figure 70 Navigation menu

Visit Blog page

- To open blog page click on blog in navigation menu [figure 37]

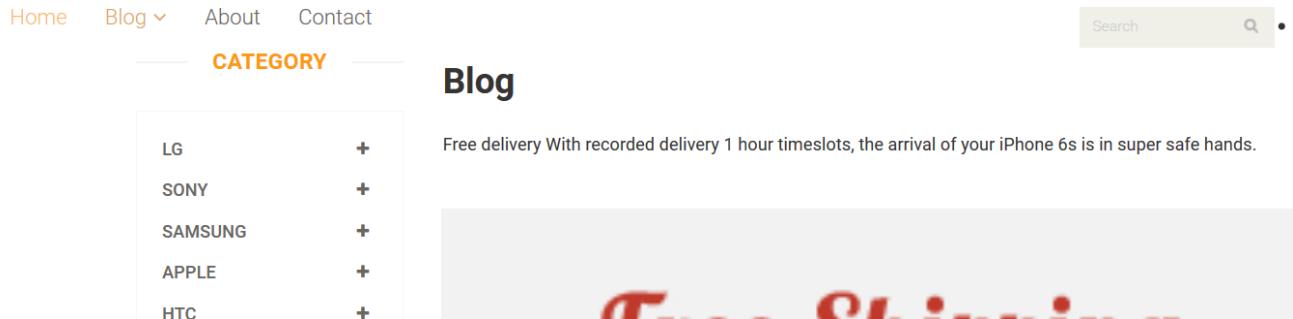


Figure 71 Blog Page

Visit About page

- To open about page click on about in navigation menu [figure 38]

Here at Mobiles.co.uk we offer some of the very best mobile phone deals in the market, whether you're looking for a contract, upgrade or pay-as-you-go offer for your next phone. With over 19 years' experience, Mobiles.co.uk is the UK's first and longest-running online mobile phone shop and today we still offer the same level of customer care and service that we always have, ensuring that our range of cheap mobile phones is as impressive as always. Everything about

Figure 72about Page

Visit Contact

- To open contact page click on contact in navigation menu [figure 39]

Figure 73 Contact Page

Explore Mobile Brands

- All available brands are listed in side menu. [figure 41]
- To list all mobiles under particular brand click on + sign in side menu [figure 40]

Figure 75Unexpanded Side menu

Figure 74 Expanded Side menu

Getting Detailed Info

- Expand the side menu and click on interested product to get detailed information. [Figure 42,43]



Figure 76 Expanded side menu



Figure 77 Product Detailed page

Login

- To perform member login click on login link in top right corner [figure 44]
- Fill the login form correctly for authentication [Figure 45]
- After successful login, member page will open [Figure 46]



Figure 78 Login Link

Login to your account

Email Address

Password

Keep me signed in

Login

Figure 79 Login Form

Account(meet_atutgorkhali@yahoo.com)

Welcome

meet_atutgorkhali@yahoo.com
[history](#)
[Log out](#)

Figure 80 Succesfull login

Sign Up

- To sign up the web application, click on login from top right [figure 47]
- Fill in the form with appropriate data [figure 48]
- Click on sign up.
- Done

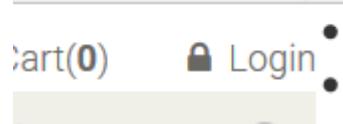


Figure 81 Sign up form

New User Signup!

Nabin Kumar Singh

nabinksingh@yahoo.com

.....

.....

9812312

Kathmandu

20151018_151722.jpg

Figure 82 Signup form

Add Product to Cart

- To add a product to cart, in product detailed view click on add to cart → done [figure 49, 50]



Figure 83 Add to cart



Figure 84 Product added to cart

Check out

- To check out from application first click on cart link to modify cart items [Figure 51]
- Modify Items number/delete item if required/add more items [figure 52]
- Then click on check out button
- Fill up the checkout form [figure 53] → continue → done



Figure 85 Cart link

Item	Price	Quantity	Total
Iphone 6 11.93 cm (4.7) 2 GB RAM and 16 GB ROM ...read more	NPR.50000	1	Delete
Total: 50000			
Update Cart		Checkout	

Figure 86 Update Cart

Bill To

Company Name	Zip / Postal Code *
Email*	-- Country --
Title	-- State / Province / R
First Name *	Confirm password
Middle Name	Phone *
Last Name *	Mobile Phone
Address 1 *	Fax
Address 2	Continue

Figure 87 Checkout fill up form

