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Designing and Developing a dynamic website using PHP

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ABSTRACT

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The main purpose of the thesis was to design and develop a user-friendly and responsive website using the PHP programming language. The website can be used for searching for a job in the Nepalese job market with a certain cost of job posting service to the job provider.

The web application was built using the PHP core language. The MAMP localhost was used to run the project locally. Admin panels were created to make the website dynamic.

As a result, the website is attractive, interactive, responsive, and user-friendly. The Website has been created and handed over to the client. All the project objective was completed but there is still place for the improvement which is in progress.

Keywords: PHP, MAMP, MySQL, Front-end, Backend, CMS

PREFACE

The project was ordered by BitMapItSolution which is located in Narayangarh, Chitwan, 44207 Nepal.

I would like to thank the Chief Executive Officer (CEO) of BitMapItSolution Roshan Kharel for providing the project and believing me to develop the website for them. I would also like to thank my supervisor Veijo Väisänen and language teacher Kaija Posio for all the guidance during the project.

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VOCABULARY

API	Application Programming Interface
CMS	Content Management System
COM	Component object model
CORBA	Common object request broker architecture
CSS	Cascading Style Sheets
DBMS	Database Management System
HTML	HyperText Markup Language
IMAP	Internet message access protocol
JS	JavaScript
LDAP	Lightweight directory access protocol
PDO	PHP Data Object
PHP	Hypertext Pre-processor
POP3	Post office protocol version 3
UI	User Interface
WWW	World Wide Web

1 INTRODUCTION

This thesis is related to the development of the website that could be used to search for a job in the Nepalese job market with a certain cost of job posting service to the job provider. The thesis work was carried out for Bitmap IT Solution Pvt Ltd. (BITS).

Bitmap IT Solution (BITS) is a creatively driven integrated Business and Advertising agency, and an IT company located in Narayangarh, Nepal that creates a high-impact business solution for both traditional and digital media to the clients.

The primary objective was to design and develop a website using the PHP programming language. The development was done by using the Client-server scripting language along with CMS (the Content Management System). Bootstrap and CSS (Cascading Style Sheets) were also used to make the website responsive and interactive. The secondary objective was to learn to implement the PHP core language.

This thesis provides all the information about the technologies used during the design and development of the webpages along with the implementation process of the website.

2 WEB DEVELOPMENT AND TECHNOLOGIES USED

Web development is the process of creating either a static or dynamic web page or web application with different technologies for the Internet (www) or an intranet (a private network). Two different technologies like front-end and back-end were used in the development of the webpage.

2.1 FRONT-END

Front-end is the part of website development where a view or design of the website can be created using different front-end tools. It is also known to be the client-side of the website. Some of the tools that were used in the development process are listed below.

2.1.1 HTML

HTML stands for the Hypertext Mark-up Language. This mark-up language informs the web browser how to display the content on the web pages. They are written in the format of tags, for instance, “body”, “head”, “title”, “section”. Most of the tags contain same or different tags as their child-elements. HTML consists of a series of elements and is used for creating web pages and websites. The “<!DOCTYPE html>” written at the top of the HTML file indicates that the document is the HTML5 document. Additionally, all the tags and content for the webpage are wrapped with the “<html>” tag. The HTML files are saved with the “.html” or “.htm” file extension.

FIGURE 1 shown below is an image of basic HTML syntax where different tags are used.

Example

```

<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>

```

FIGURE 1. HTML Syntax [1]

2.1.2 CSS

CSS stands for the Cascading Style Sheet that is used to design the websites. CSS handles the look and feel part of a web page and controls the style of a web document simply and easily. Using CSS, the color of the text, the style of fonts, how columns are sized, what background images or colors are used, the spacing between paragraphs, as well as a variety of other effects can be controlled. It can be written either in an HTML file or a separate file with the “.css” extension. [2]

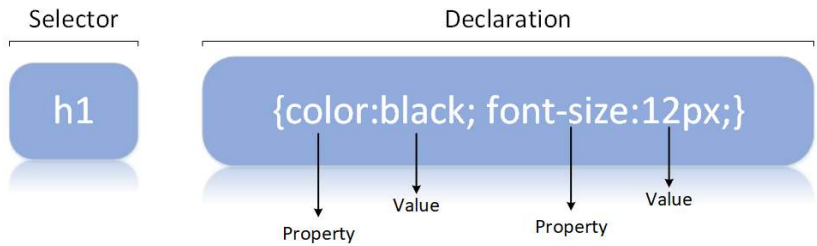


FIGURE 2. CSS Syntax [2]

As shown in FIGURE 2 above, a standard CSS syntax consists of a selector and a declaration block. HTML elements are indicated with the selector or tag like “<h1>”. An attribute type of HTML element is a property for example “color”, “font-size” and each property is allocated with values like “black”, “12px” as shown in

figure 2. The property and value are separated by a colon (:). Each declaration block is surrounded by curly braces and each declaration ends with a semicolon (;).

2.1.3 JavaScript

JavaScript is a dynamic computer programming language that is normally used as part of webpages, whose implementation allows the client-side script to interact with the user and make the page dynamic. The JavaScript code can be placed in an HTML file within a <script> tag or also can be used in a separate file with an extension “.js” file. Commonly JS is used for image manipulation, form validation, and dynamic changes of content. JS often uses a document. getElementById () method to select the HTML Element. [3]

```
<!DOCTYPE html>
<html>
<body>

<h2>JavaScript Functions</h2>

<p>This example calls a function which performs a calculation, and returns the result:</p>

<p id="demo"></p>

<script>
function myFunction(p1, p2) {
  return p1 * p2;
}
document.getElementById("demo").innerHTML = myFunction(4, 3);
</script>

</body>
</html>
```

JavaScript Functions

This example calls a function which performs a calculation, and returns the result:

12

FIGURE 3. JavaScript Function [4]

FIGURE 3 shown above is an example of the JavaScript function in which functions p1 and p2 inside the <script> tags are carried out to perform a calculation and results from the value 12.

2.1.4 Bootstrap

Bootstrap is a free tool for developing the responsive front-end design of any webpage. It is an open source that can be customized as per the requirement of the website. Bootstrap works along with HTML, CSS, and jQuery to make the web UI (User Interface) more interactive, such as typography, forms, buttons navigation, dropdown, layout, and carousel.

Bootstrap offers ready-made blocks of code that can be used and customized to suit our application requirements. It also provides predefined CSS and libraries which take lesser effort while developing the web pages. It provides developers a centralized development codebase features that help to maintain consistency and most importantly it has several responsive features which are compatible with all the latest browsers. The framework can either be downloaded directly from “getbootstrap.com” or be introduced to code as a CDN (Content Delivery Network). [5]

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Bootstrap Example</title>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
  <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>
  <script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></script>
  <style>
    /* Set height of the grid so .sidenav can be 100% (adjust if needed) */
    .row.content {height: 1500px}

    /* Set gray background color and 100% height */
    .sidenav {
      background-color: #f1f1f1;
      height: 100%;
    }

    /* Set black background color, white text and some padding */
    footer {
      background-color: #555;
```

FIGURE 4. Bootstrap Example [6]

FIGURE 4 shown above is an example showing the use and the implementation of the Bootstrap on any website.

2.2 BACKEND

This is the server-side development of the webpage which stores and arranges the data to make sure that the client-side of the webpage works fine and receives all the data from the database. This part of the website cannot interact with the users. Creating libraries, writing APIs (Application Programming Interfaces), and working with system components without the user interface can be carried out in the backend.

2.2.1 MAMP Localhost

MAMP is the acronym of different components like “Mac OS X, Apache, MySQL, and PHP”. It is a free local server environment which is used for testing and web development. The server operates and installs the AMP stacks that contain different packages [7], as Apache is the web-server software which enables a computer to host many websites that can be accessed through the Internet using the web browser and MySQL which is a relational database management system that allows accessing the data from the system that has PHP. It helps to make the webpage dynamic.

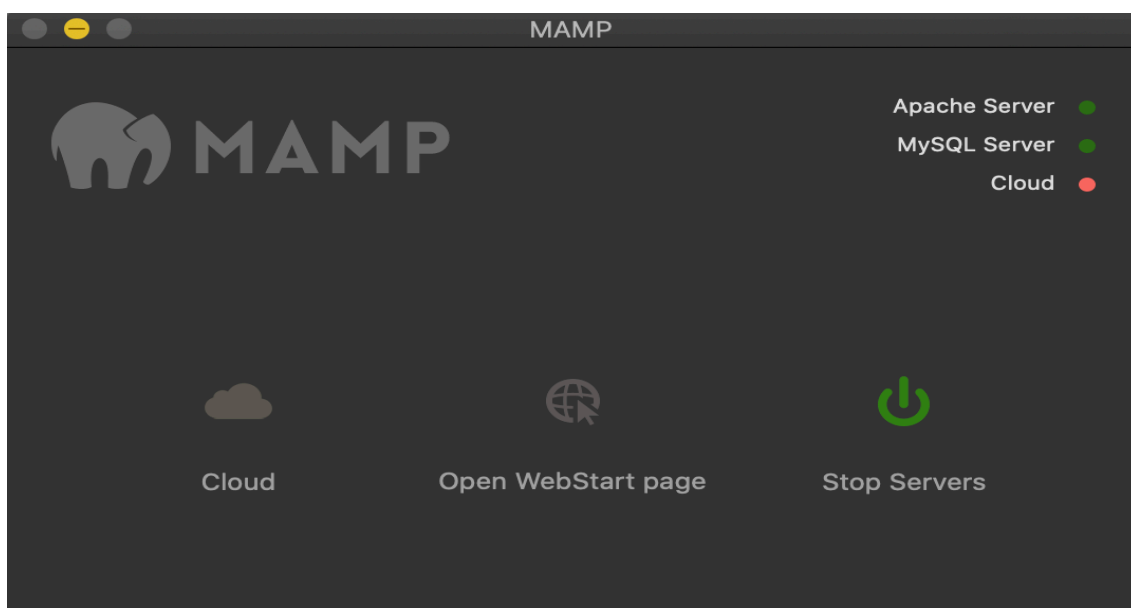


FIGURE 5. MAMP Localhost

FIGURE 5 shown above is an image of the MAMP localhost that is used to control the server.



FIGURE 6. Default Homepage of MAMP

FIGURE 6 shown above shows the appearance of the MAMP localhost in which the server can be started, and it takes to the default homepage of MAMP as shown in figure 6. PhpMyAdmin is located in the tools menu.

PhpMyAdmin is a free software tool written in PHP for handling the administration of MySQL over the web. Commonly used operations, such as managing databases, users, tables, relations, columns, and indexes are supported by PhpMyAdmin. Some of the common features of PhpMyAdmin are listed below.

[8]

- Creating graphics of the database layout in different formats.
- Importing data from CSV and SQL
- Using a set of predefined functions, Data can be transferred into any formats like displaying BLOB-data as an image or download link.
- Multiple servers can be administered.

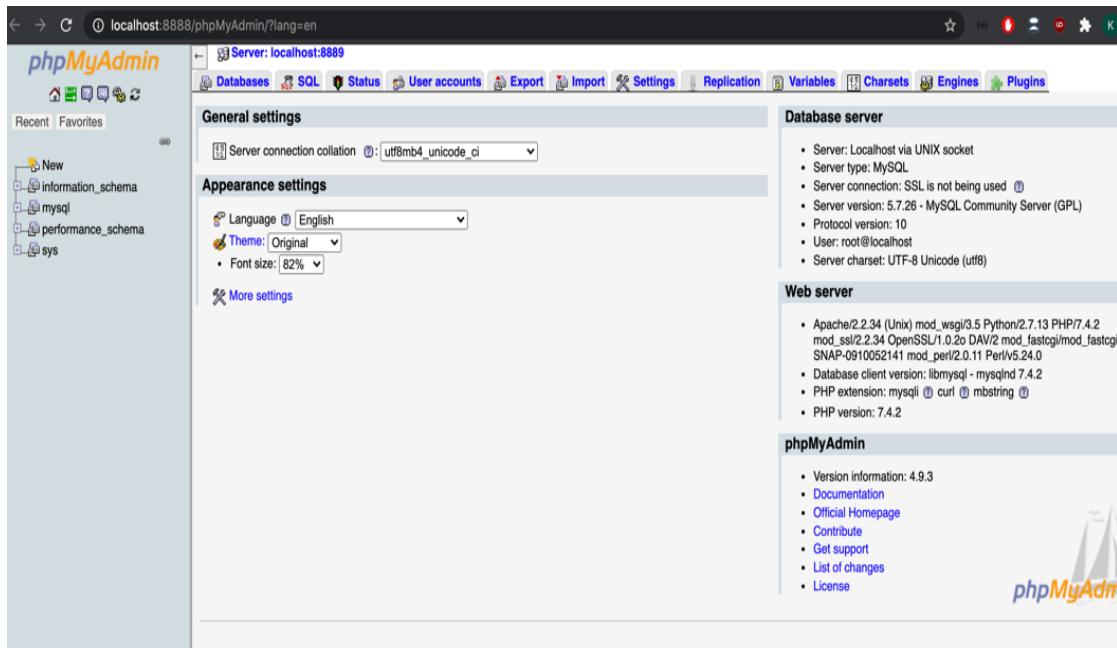


FIGURE 7. Homepage of PhpMyAdmin

FIGURE 7 shown above is an image of the homepage of PhpMyAdmin that is used to create and manage database tables.

2.2.2 PHP

PHP is a recursive name for “Hypertext Pre-Processor. PHP has been an important language for developing commercial sites for all the developers to sustain in the Software development field. PHP started as a small open source project that evolved highly later as it was very useful for developing and building the websites and bigger projects. The first version of PHP was developed way back in 1994 by Rasmus Lerdorf. PHP is a server-side scripting language that is embedded with HTML. It is used to manage dynamic content, build an e-commerce site, integrate with MYSQL and Oracle. The major protocols, such as POP3, LDAP, IMAP, and PHP4, added support for Java and distributed object architecture (COM and COBRA) making n-tier development possible. [9]

FIGURE 8 shown below is an example of the script to write PHP along with the output that is received.

```
<!DOCTYPE html>
<html>
<body>

<h1>Developer News</h1>

<?php echo "The Best PHP Examples"; ?>

</body>
</html>
```

The output of that would be:

```
Developer News

The Best PHP Examples
```

FIGURE 8. PHP Script examples with output [10]

Some of the common features of PHP are given below.

- Performing a system function, such as CRUD (Create, Read, Update, and Delete).
- It has built-in support for a working hand with MySQL.
- Setting a cookies variable and encrypting the data.
- PHP is cross-platform; this means that an application can be deployed in various operating systems. [12]

2.2.3 MySQL

MySQL is a very popular, open-source DBMS (Database Management System) which handles very large databases and gives fast and reliable performance.

SQL provides a structured language for querying or updating multiple databases.

Some of the features of MySQL are given below. [11]

- Can be installed locally.
- Multi-users access to several databases offered.
- Easy to use Shell for creating tables, querying tables.
- Frequently used by PHP and Perl
- Strong data protection
- High performance.

Basic queries for MySQL are written as

```
MySQL > SELECT VERSION (), CURRENT_DATE;
```


3 IMPLEMENTATION OF THE WEBSITE

When the user logs in to the website, the user can view the apply button on every list of job shown on the website. Once the apply button is pressed, it will redirect the user to the application form page where they can put in their details about education, work experience, and personal data required to apply for the job. Then the company will get a notification telling that a new application has been filled.

After that, the admin will log in to the admin panel of the website and see the application under the manage application section where the admin can mark the status of the application and the user will receive an email showing the status of their application with additional information.

The process, tools, and methodology are explained in this section below.

3.1 Development Tools

Development tools are the computer program that is used by the developers to create, debug, maintain, or support the other programs and an application. Some of the common development tools used for the development of the website are code editor, web browser, and Hosting.

3.1.1 Code Editor

To create any website, choosing a good code editor can make work more effective and efficient. Among many code editors, VS code (visual studio code) was selected for the development of the website.

VS code supports multiple programming languages which means that it can easily detect if there is any fault or cross-language reference. With the ever-increas-

ing demand of the code, security and time are valuable, and VS code is connected with the Git repository for pulling or saving in the meantime. Other features, such as terminal support, multi-projects support, and extensions, are provided by the Visual studio code.

3.1.2 Hosting

GitHub was used as a source code hosting platform to store the codes of the project. GitHub keeps track of all the changes made in the project. Source code in GitHub is publicly available to others but it also has the option to keep the codes private. The private repository in GitHub can only be accessed if the owner of the repository invites someone to collaborate in the project. [13] The user of GitHub can also create different branches for different purposes in the same repository and later on can merge them in the master branch. Creating another branch does not affect the master branch and the user can pull the file according to those branches.

3.2 File Structure

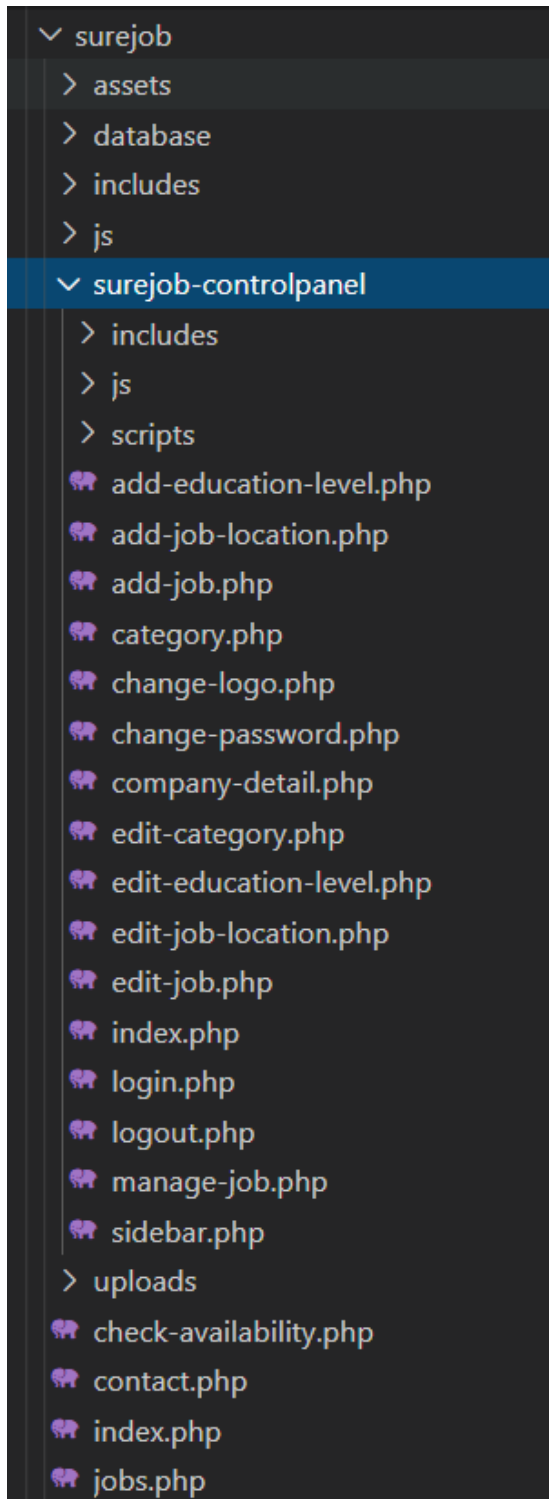


FIGURE 9. Project file structure for both front-end and back-end.

FIGURE 9 shown above is an image of the project structure used for the development of the website.

In this structure, the “Surejob” folder contains all the sub-folders as well as files. The “includes” folder contains the configuration file that is used for the connection to the database and the header, navbar, and footer of the website. The image file and styling files are stored inside the “assets” folder. The “js” folder is used to store the scripts of the website. Similarly, the “database” folder contains the SQL file. Additionally, the “Surejob-controlpanel” folder is the folder that contains all the files and folders that are used to manage the content of the website.

3.3 UI of the website

3.3.1 Navigation Bar and Search Box

The navigation bar is used to navigate through different pages of the website. There are two navigation bars on the website. One is for the user panel and the other is for the admin panel. Home, Contact, Login, and Register pages of the website can be accessed through the navigation in the user panel. The Login and Register buttons will be changed to the Dashboard dropdown once the user is logged in. The dropdown includes the link to the profile of the user and the logout button.

FIGURE 10 shown below is an image of the navigation bar that can be seen by the user of the website.



When logged out



When logged in

FIGURE 10. The navigation bar for user panel.



FIGURE 11. Search box

FIGURE 11 shown above is an image of the search box of the website. The search box has an input field and a select option where the user can select the category of the job to narrow the result of the search query.

3.3.2 Home and Search Result Page

The home page is the main page of the website. It is the first page that is opened when the user enters the URL of the website. On this page, there is a left and right side. The right side of the page shows the social media page of the company and the left side contains the search box of the website and below that, there is the list of latest jobs. FIGURE 12 shown below is an image of the home page of the website.

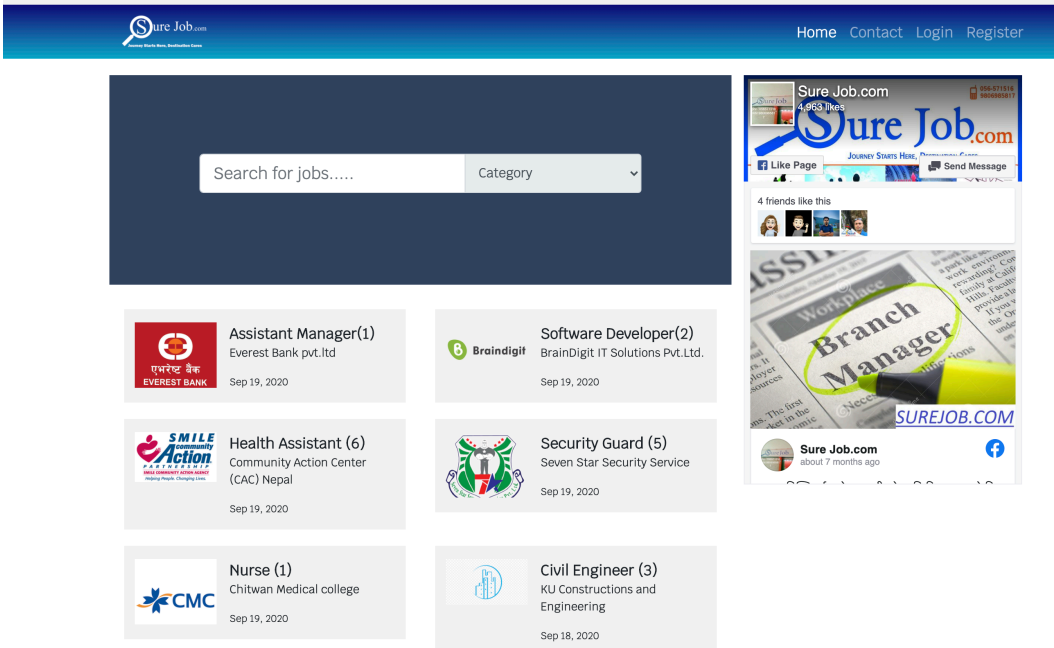


FIGURE 12. The home page of the website.

The search page of the website is similar to the home page where the filtered list of jobs is shown according to the search query and search category selected by the user. This page also has a search box as same as the home page. When there are no search results found, then the page shows a “No results found” message as shown in figure 13 below.

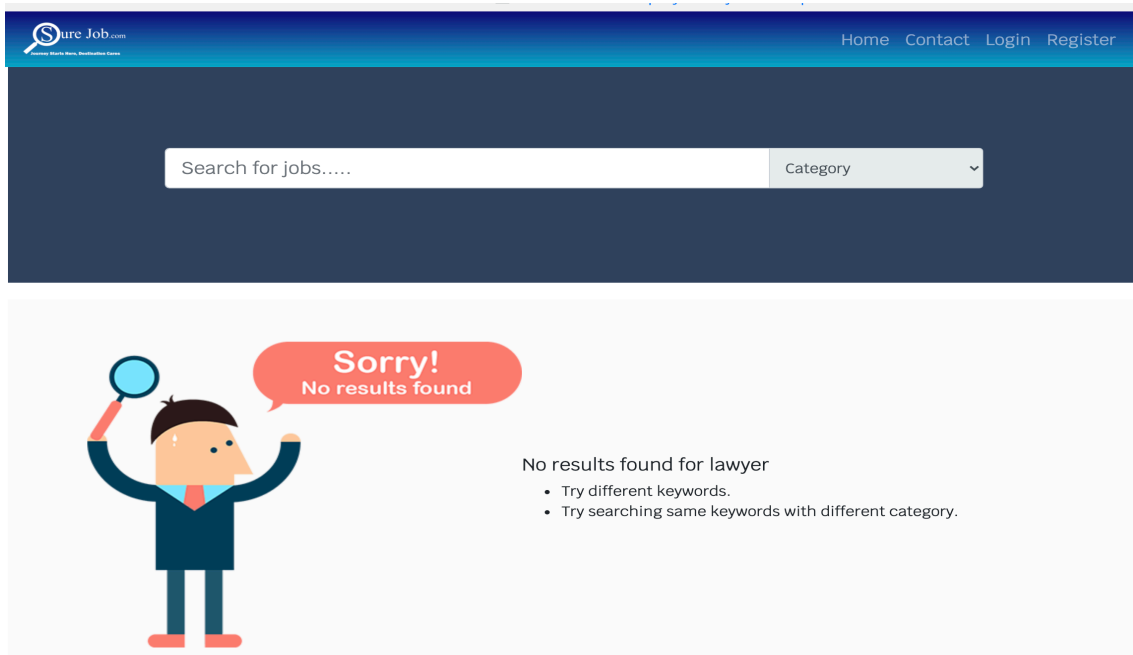


FIGURE 13. The search result page of the website when no results are found.

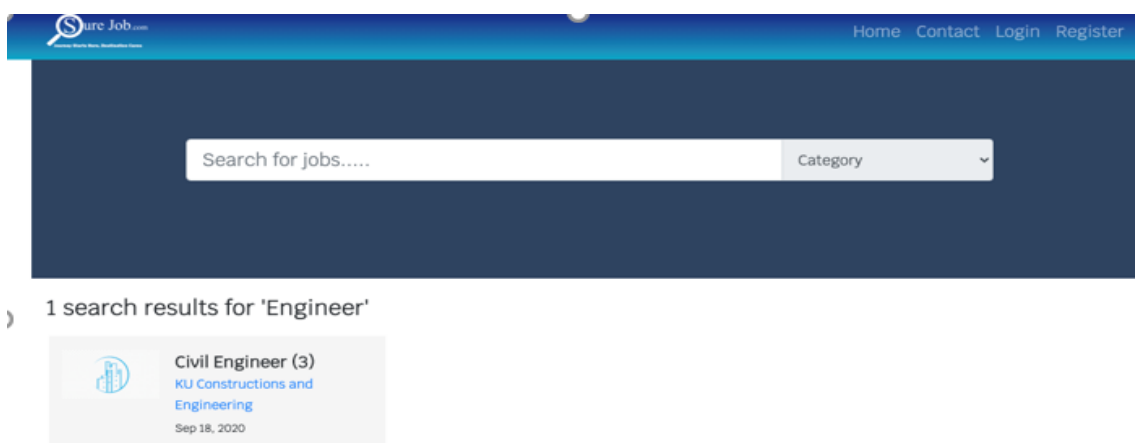


FIGURE 14. The search result page of the website when at least one result is found.

FIGURE 14 shown above is an image of the search result page that appears when the user searches for jobs or company and at least one result is found with the query that was entered by the user.

3.3.3 Contact Page and Footer

The contact page of the website is used by the user to contact the owner of the website. The page has a Google map framed on the left and the contact form with the field to put full name, email, and message by the user. When the user sends the message, it is sent to the email of the owner of the website.

FIGURE 15 shown below shows the UI of the contact page.

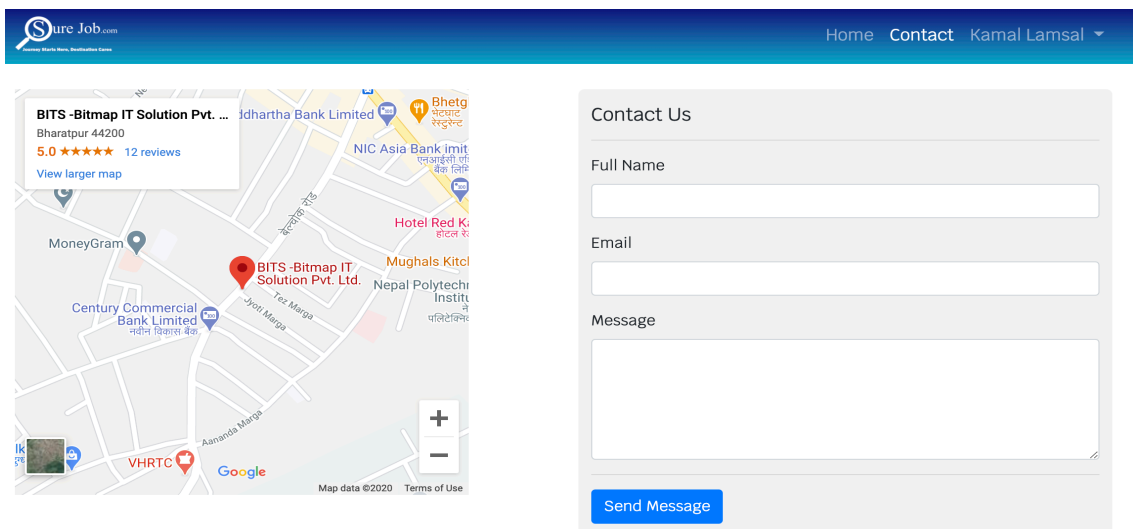


FIGURE 15. Contact Page of the website

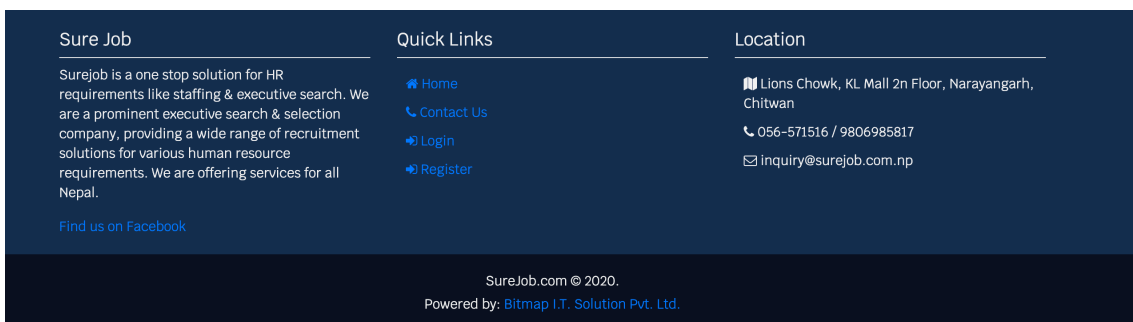
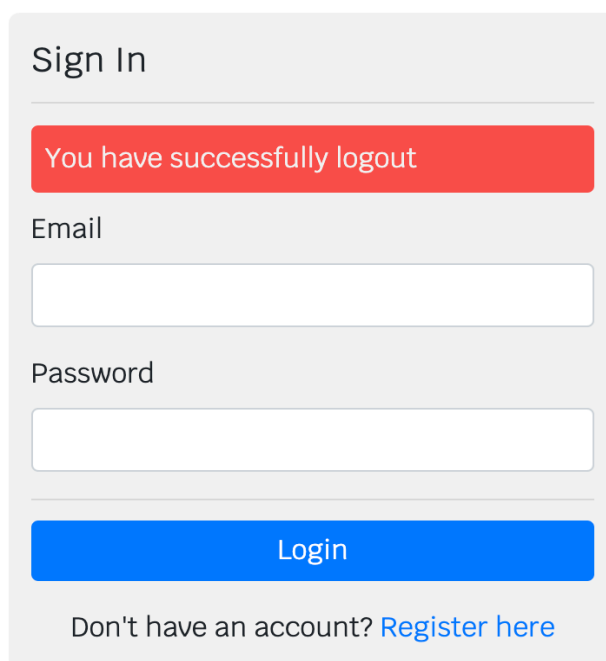


FIGURE 16. Footer of the website.

FIGURE 16 shown above is an image of the footer of the website. In the footer, a detail about the company is shown with the link to redirect to the Facebook page of the website. It also has quick links to make it efficient for the user to visit through different pages. Furthermore, it has the location section, where the location, phone, and email of the company are shown. The data of the location comes from the database. Additionally, the company name, the year, powered by is shown at the bottom of the footer.

3.3.4 Login and Register Page

The login page is used to log in the user into the website to apply for the listed jobs. For the user to log in, they first need to register into the website which can be done by visiting the register page of the website. On the register page, users have to enter their details, such as full name, email, password, address, phone number, education level, job location and job field they want to work in, vehicle and license availability, and their picture. After that, the user can log in using the email and the password they used to register on the website.



The image shows a 'Sign In' form with a red success message: 'You have successfully logout'. Below the message are two input fields labeled 'Email' and 'Password'. A blue 'Login' button is positioned below the password field. At the bottom, there is a link that says 'Don't have an account? Register here'.

FIGURE 17. Login Page of the website

FIGURE 17 shown above is the form that is on the login page of the website. Once the user is logged out, then it informs the user that they are logged out by showing the message as in the above figure.

Register

Full Name

Email

Password

Minimum eight characters, at least one uppercase letter, one lowercase letter and one number.

Address

Phone Number

Education Level

Select your Education Level

Job's Location

Select job location you want to work at

Job Field

Select job field you want to work in

Do you have a vehicle?

Yes No

Do you have a driving license?

Yes No

Choose Profile Picture

No file chosen

Note: Only .jpg and .png formats are allowed.

Already have an account? [Login here](#)

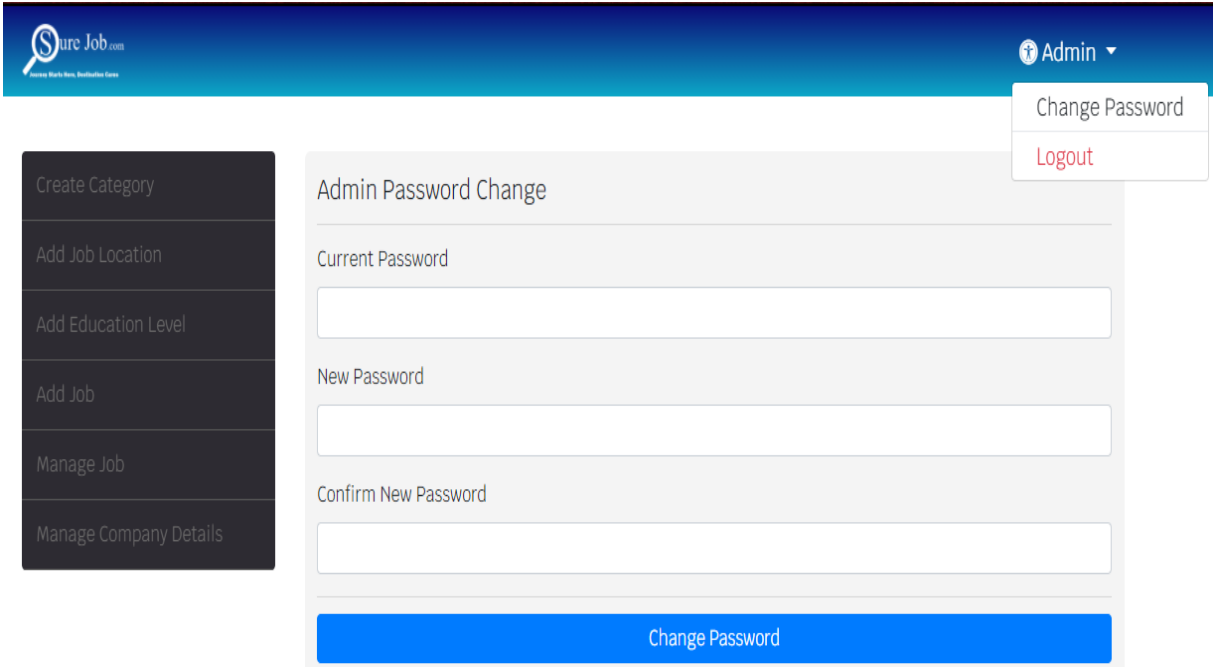
FIGURE 18. Register page of the website.

FIGURE 18 shown above is the form that is on the register page of the website. The form informs the user about the success or failure of their registration by showing an alert message.

3.3.5 Admin Panel of the website

The admin panel can be accessed only by authorized people. This panel is used to manage the content of the website. Initially, when the admin panel is visited, it is redirected to the login page of the admin. Once the admin is logged in, then it redirects the page to the “change-password” page of the website where the admin can change the password for the admin login. The panel also has the sidebar to go to different admin pages of the website.

FIGURE 19 shown below is an image of the “change-password” page for the admin panel.



The screenshot displays the 'Admin Password Change' page within the Sure Job.com admin interface. The top navigation bar includes the 'Sure Job.com' logo and a user profile dropdown menu labeled 'Admin', which contains 'Change Password' and 'Logout' options. A dark sidebar on the left lists administrative actions: 'Create Category', 'Add Job Location', 'Add Education Level', 'Add Job', 'Manage Job', and 'Manage Company Details'. The main content area features three input fields for 'Current Password', 'New Password', and 'Confirm New Password', followed by a prominent blue 'Change Password' button.

FIGURE 19. Change password page for admin panel.

FIGURE 20. Create a new category page.

FIGURE 20 shown above is an image of the category page where the admin can add a new category and edit and delete the existing categories.

FIGURE 21. Manage Job Location page.

FIGURE 21 shown above is an image of the job location page where the admin can add new job locations and edit and delete the existing job locations.

FIGURE 22. Manage an education level page.

FIGURE 22 shown above is the page where the admin can add new education levels to the list and manage the existing levels.

FIGURE 23. Add a new job page.

FIGURE 23 shown above is a page where the admin can add new job posts. The form consists of an input field to write the job title, name of the company, category of the job, URL and logo of the company, and additional information.

The image shows a web interface for updating company details. On the left is a dark sidebar with the following menu items: 'Create Category', 'Add Job Location', 'Add Education Level', 'Add Job', 'Manage Job', and 'Manage Company Details'. The main content area is titled 'Update Company Detail' and contains the following form fields:

- Phone Number: 056-571516
- Mobile Number: 9806985817
- Email: inquiry@surejob.com.np
- Address: Lions Chowk, KL Mall 2n Floor, Narayangarh, Chitwan

A blue button labeled 'Update Company Details' is located at the bottom of the form.

FIGURE 24. Company details update page.

FIGURE 24 shown above is the page that is used to edit the detail of the company, such as phone/mobile number, email, and address. This data is shown at the footer of the website.

4 CONCLUSION

The main aim of the thesis was to design and develop a responsive website with the PHP core language, MySQL, and HTML for Bitmap IT Solution. The idea of the project was to build a website where the user can search for different jobs in various cities of Nepal. Apart from the difficulties faced during the developing and learning phase, the main aim of the thesis project was achieved by the author. The implementation process and development of the website are explained in Chapter 3.

The project allowed the author to learn new skills, such as Content Management System, and Database Management. All the job seekers and job providers can easily search for the job and put the job vacancy on the website respectively. The implementation of the website is dynamic, and the admin panel can manage the content as required.

During the development of the website, the author learned that it is easier to manage the content of the website if the website has an admin panel that is only accessible to the owner of the website. The author also learned to implement the CMS on the website and different types of implementation method that can be done in PHP, such as PDO (PHP Data Object) and MySQLi. The author used MySQLi to connect PHP with the database.

The final result of the website was tested among different users to test the efficiency, interactivity, and attractiveness of the website. According to the users, the website was simple yet elegant looking, user-friendly, responsive, and informative. Some users also suggested implementing the dark mode on the website to make it more attractive and easier to use in dim lights. The process and methodology that were described above in Chapter 3 can be used by others to design and develop similar concept websites.

The implementation of the website was completed successfully. Apart from some features, the objective and the result of the project is the same. However, there are still some features that can be implemented in the project. The features, such as auto-suggesting jobs according to the location of the user, filtering jobs by city, category, and application dates, implement the dark and light mode system.

In conclusion, the design and development of the website and writing of this report was a great learning and working experience for the author.

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