

COMPLEX ENGINEERING PROBLEM

ASSIGNMENT

SUBJECT:

WEB ENGINEERING

SUBMITTED TO:

SIR MANSOOR SAMO

PROJECT NAME:

SHAIKH WHEELS

(A Car Buying and Selling Website)

BY:

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DATE OF SUBMISSION:

28-4-2024

Mehran University ofEngineering and Technology, Jamshoro

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|  | Course: Web Engineering (SW417) | |  |
| Instructor | Mr. Mansoor Samo Assignment Type | | Complex Engineering Problem |
| Semester | 7th | Year | Final |
| Assignment Date | 15-03-2024 | Submission Deadline | 01-04-2024 |
| Assessment Score | 10 Marks |  |  |

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| Complex Engineering Problem - Characteristics |  |  |
| 1 Depth of knowledge Required |  |  |
| 2 Range of Conflicting Requirements |  |  |
| 3 Depth of Analysis Required |  |  |
| 4 Infrequently Encountered Issues Involved |  |  |
| 5 Beyond codes/standards of practice |  |  |
| 6 Diverse groups of stakeholders with widely varying needs involved |  |  |
| 7 Interdependence (high level problems including many component parts/sub-problems) |  |  |
| 8 Have significant consequences in a range of contexts |  |  |
| 9 Judgement (Require judgement in decision making) |  |  |

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| Problem Description |
| Students are asked to develop website project of their own choice. The project development is based on programming skills they have already learned in web engineering or they already know the programming skills used in the website project. Students are asked to submit the report which contain the solution of these queries:     * Provide a clear articulation of the problem your website project aims to solve or the purpose it serves. What motivated you to choose this particular project?   Answer:    Our Car Sales Website (ShaikhWheels) tackles the inefficiencies of traditional car transactions by offering a streamlined online platform.  This website aims to simplify buying and selling processes, provide comprehensive vehicle information, and enhance transparency and security. We chose this project to leverage technology for a more convenient and efficient car sales experience, ultimately revolutionizing the automotive industry.   * What programming languages, frameworks, libraries, and tools did you utilize in developing your website project and why?   Ans:  In developing the ShaikhWheels website project, I utilized the following technologies:   1. HTML: HTML (Hypertext Markup Language) was used for structuring the content of the web pages. It provides the basic framework for organizing text, images, and other media elements. 2. CSS: CSS was used for styling the HTML elements, making the website visually appealing and enhancing the user experience. It helped in creating a consistent and attractive layout across different devices. 3. JavaScript: JavaScript was used to add interactivity and dynamic behavior to the website. It enabled features such as form validation, interactive car search filters, and slideshow galleries. 4. Bootstrap: Bootstrap is a popular CSS framework that was used to streamline the development process and ensure responsiveness across various devices and screen sizes. It provided pre-built components and responsive grid system, saving time and effort in designing the layout. 5. PHP: PHP (Hypertext Preprocessor) was used for server-side scripting to handle backend functionality such as user authentication, listing ads, and database operations. It allowed for dynamic content generation and interaction with the database. 6. MySQL: MySQL was used as the database management system to store and retrieve data related to user accounts, car listings, and other relevant information. It provided a robust and efficient way to manage the website's data. 7. jQuery: jQuery, a JavaScript library, was used to simplify DOM manipulation and event handling tasks. It helped in writing concise and efficient JavaScript code for implementing various functionalities. 8. Visual Studio Code: Visual Studio Code was used as the code editor for writing and debugging the HTML, CSS, JavaScript, PHP, and MySQL code. It provided features such as syntax highlighting, code completion, and debugging tools, enhancing the development workflow.  * Provide a description of the overall architecture and design of your website project.   Ans:  The overall architecture and design of the ShaikhWheels car sales website project:   1. Client-Server Architecture:    * The website follows a client-server architecture where the client (web browser) interacts with the server (back-end) to request and receive data.    * Client-side technologies (HTML, CSS, JavaScript) handle the presentation and user interaction, while server-side technologies (PHP, MySQL) manage data processing and storage. 2. Frontend Design:    * The frontend design is built using HTML, CSS, and JavaScript, providing a visually appealing and user-friendly interface.    * CSS is used to style the layout, fonts, colors, and other visual elements to create an intuitive and engaging user experience.    * JavaScript enhances interactivity by implementing dynamic features such as car listing filters, interactive forms, and user feedback mechanisms. 3. Responsive Design:    * The website is designed to be responsive, ensuring optimal viewing and interaction across various devices and screen sizes.    * Bootstrap framework is utilized to create a mobile-first responsive layout, ensuring consistent design and usability on desktops, tablets, and smartphones. 4. System Design:   DATA FLOW DIAGRAMS     1. Database Design:   The system is analyzed to the requirements and possible tables and fields are identified.   * Identifying keys: Once we have drawn up the list of possible tables and fields, the next step in the logic database is to identify and set foreign keys for each table. * Primary keys: A primary key consist of a field or a set of fields that uniquely identify each record in that table. The “primary“ field defines the primary key. * Foreign key: A foreign key comprises a field or multiple fields that links to the primary key of another table.   TABLES    TABLE 1: USERS       * Main features and functionalities of your website project. Explain how users interact with your website and what actions they can perform. Sketch diagrams.   Ans:   1. User Authentication: Users can sign up and log in securely to access the platform's features. 2. Car Listings: Sellers can list their cars for sale, providing details such as make, model, year, price, and location. 3. Car Search: Users can search for cars based on various criteria such as make, model, year, price range, and location. 4. Filtering and Sorting: Users can filter search results and sort cars based on different attributes like price, year, and mileage. 5. Detailed Car Information: Each car listing includes detailed information, photos, and contact details of the seller. 6. Buying and Selling: Users can easily contact sellers to inquire about cars or initiate the buying process. 7. Responsive Design: The website is responsive and works seamlessly across desktop, tablet, and mobile devices. 8. User Dashboard: Registered users have access to a personalized dashboard where they can manage their listings, saved searches, and account settings. 9. Notifications: Users receive notifications for important events such as new listings matching their search criteria or messages from potential buyers. 10. Admin Panel: Administrators have access to a backend panel to manage users, listings, and other aspects of the website.   USE CASE DIAGRAM     * What were the major challenges you encountered during the development process? How did you address or overcome these challenges?   Ans:   1. Complexity of Data Management:   Challenge:  Managing a large volume of car listings, user accounts, and transactional data posed a challenge, especially in terms of database design and data retrieval.  Solution:  We addressed this challenge by designing an efficient database schema that normalized the data and optimized queries for fast retrieval.   1. Security and Privacy Issues:   Challenge:  Ensuring the security of user data, protecting against unauthorized access, and safeguarding transactions were critical challenges, considering the sensitivity of personal and financial information.  Solution:  We implemented robust security measures, including encryption for sensitive data, secure authentication mechanisms, input validation to prevent SQL injection and cross-site scripting (XSS) attacks.   1. Cross-browser Compatibility:   Challenge:  Ensuring that the website functions consistently across different web browsers (e.g., Chrome, Firefox, Safari) and platforms (e.g., desktop, mobile) posed a challenge due to variations in rendering engines and CSS support.  Solution:  We conducted extensive testing on multiple browsers and devices to identify and address compatibility issues. We used modern CSS features and followed web standards to ensure cross-browser compatibility. Additionally, we leveraged tools like browser developer tools and online testing platforms to diagnose and fix issues.   1. User Interface Design and User Experience:   Challenge:  Designing a visually appealing user interface (UI) that provides a seamless user experience (UX) was challenging, considering the diverse needs of users and the complexity of presenting car listings and search results.  Solution:  We conducted user research and usability testing to gather feedback and iteratively improve the UI design.  We also followed design best practices, such as using clear navigation, consistent layout, and responsive design, to enhance the overall UX.   * Possibilities for future enhancements or iterations of your website project. Did you learn any valuable lessons or insights during the development process?   Ans:  Possibilities for future enhancements or iterations of ShaikhWheels car sales website project:   1. Secure Payment Integration:   Enable secure online payment processing for car purchases directly on the website.   1. Car Inspection Services:   Offer car inspection services to assess the condition and quality of vehicles listed on the platform.   1. Car Insurance Options:   Provide options for users to purchase car insurance directly through the website.   1. Cars Comparison Tool:   Implement a tool for comparing features, specifications, and prices of different cars.   1. Spare Parts Marketplace:   Create a marketplace for buying and selling spare parts and accessories for cars.  **During the development process, we gained valuable insights into project planning, time management, collaboration (if working in a team), and the importance of following best practices for code organization, documentation, and testing.** |