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**Project Proposal**

**Top Deal Auto Website**

**Company:** Top Deal Auto Melbourne, Australia

**Software:** Car Selling Website

**Team name:** Prestige K/DA

**Team Members:**

| **Name** | **ID** | **Roles** |
| --- | --- | --- |
| Pham Duc Linh | 103792371 | Product Owner - BA |
| Pham Anh Vu | 103806447 | Solutions, IT Architect |
| Nguyen Thanh Dat | 103804881 | Project Manager - Scrum Master |
| Tran Tuan Nam | 103792643 | Lead Developer (BE) |
| Phung Xuan Tung | 103792054 | Lead Developer (FE) |

**Tutorial class:** Fri 1:00 PM DT7.2

**Tutor’s Name:** Dr. Pham Thi Kim Dzung

**Background / Problem Description**

The project under consideration involves the development and enhancement of Top Deal Auto's online presence. Top Deal Auto, a longstanding car retailer in Australia founded by Bill Joyce and partners, initially faced challenges in the competitive market during the 1970s. However, their fortunes changed in 1978 when a loyal customer, now a prominent figure, showcased their Melbourne car yard in a TV show. This pivotal moment catapulted Top Deal Auto to become the preferred car supplier for local businesses and government agencies. With the retirement of Bill Joyce and partners, the next generation now manages the business. The current initiative focuses on creating a more professional and responsive website accessible on multiple devices. This strategic move aims to improve services locally and cater to the growing demand both within the region and across state borders. The project aligns with Top Deal Auto's commitment to adapt and thrive in the evolving automotive market.

**Scope**

Re-design and Optimize Online Presence: Develop a more professional and responsive website to enhance Top Deal Auto's online visibility and user experience.

Scalability for Market Expansion: Meet the increasing demand for services locally and extend reach to interstate markets through an improved online platform.

Enhance User Interface: Create an intuitive and user-friendly interface to ensure seamless navigation for potential buyers visiting the website.

Implement Comprehensive Car Catalogue: Develop and integrate a detailed car catalogue that allows for easy browsing and search functionalities, catering to user preferences and requirements.

The software capabilities encompass the creation of an intuitive and user-friendly interface, ensuring seamless navigation for potential buyers. Specific goals include the implementation of a comprehensive car catalog, facilitating easy browsing and search functionalities. Additionally, the website will enable users to initiate and manage trading activities, providing a user-driven experience. The system will incorporate multi-device compatibility, allowing accessibility across various platforms. It is crucial to note that while this project focuses on the website's improvement, aspects such as internal business processes, inventory management, and external marketing strategies are considered outside the scope of this endeavor. The primary focus is on enhancing the customer-facing online platform to elevate Top Deal Auto's market presence.

**Stakeholders**

Top Deal Auto, founded by Bill Joyce and partners, is an Australian car retailer with three yards and showrooms. The company prioritizes customer and employee relationships, ensuring buyers only purchase suitable cars. Customers have the flexibility to cancel trading activities.

Established in 1972 in Melbourne, Top Deal Auto faced challenges against major competitors Ford and Holden. By 1978, a loyal customer, now a famous star, chose their Melbourne yard as a TV show backdrop, boosting their reputation. This led to Top Deal Auto becoming the preferred supplier for local businesses and government agencies.

Bill Joyce and partners have retired, and their children now run the business. Currently, Top Deal Auto aims to enhance its services by developing a more professional website accessible on various devices, catering to the growing demand both locally and interstate.

**Deliverables and schedule**

In terms of what we're delivering, it's essentially a brand-new and improved Top Deal Auto website. You'll have a fully operational site that's easy to use for both customers and staff. We'll hand over all the necessary files and documents, including the "behind-the-scenes" code that makes the website work. To make things even simpler, we'll provide a user manual that explains how to use the website and a training program to get everyone up to speed. Think of it as getting a complete package – a modern website ready to go, and everything you need to know to make the most of it. If there's anything you need ongoing help with, we can discuss that too, but for now, our focus is getting this user-friendly and efficient website up and running for Top Deal Auto.

The main deliverables of this project are:

A redesigned and optimized website for Top Deal Auto that showcases its competitive differentiation, enhances its online presence and user experience, and meets the functional, usability, reliability, and security requirements.

A comprehensive car catalogue that allows users to browse and search for cars based on various criteria, such as make, model, year, price, mileage, color, etc..

A user manual that guides the users on how to use the website and its features, such as creating an account, logging in, updating profile, browsing and searching for cars, creating and viewing listings, making and accepting offers, etc.

| Phase | Activity | Task | Milestone | Deadline |
| --- | --- | --- | --- | --- |
| Planning | Define project scope, objectives, deliverables, and quality metrics | -Review client’s requirements and expectations | -Project charter approved | Jan 25, 2024 |
|  |  | -Develop project plan, schedule, budget, and risk management plan | -Project plan approved | Feb 2, 2024 |
| Design | Design the website layout, interface, and functionality | -Create wireframes and mockups of the website pages and features | -Wireframes and mockups approved | March 9, 2024 |
|  |  | -Create database schema and data model for the car catalogue and trading platform | -Database schema and data model approved | March 16, 2024 |
| Development | Develop the website front-end and back-end | - Implement the website pages and features using HTML, CSS, JavaScript, and PHP | - Website front-end completed | March 19, 2024 |
|  |  | - Implement the database and data access layer using MySQL and PHP | - Website back-end completed | March 26, 2024 |
| Testing | Test the website functionality, usability, reliability, and security | - Conduct unit testing, integration testing, system testing, and user acceptance testing | - Website tested and approved | March 30, 2024 |
|  |  | - Conduct performance testing, load testing, stress testing, and security testing | - Website optimized and secured | April 4, 2024 |
| Deployment | Deploy the website to the production environment | - Transfer the website files and database to the client’s server | - Website deployed and live | April 10, 2024 |
| Documentation | Document the website features and usage | - Write the user manual for the website users | - User manual completed | April 13, 2024 |
|  |  | - Write the training manual for the website staff | - Training manual completed | May 18, 2024 |
| Closure | Close the project and hand over the deliverables | - Obtain client’s feedback and approval | - Project deliverables accepted | May 21, 2024 |
|  |  | - Conduct project evaluation and lessons learned | - Project closed | May 21, 2024 |

**Initial Release Schedule**

| **No.** | **Item** | **Dependencies** | **Business Value  (1 least – 10 most)** | **Release Schedule**  **(Sprint 1 | 2 | 3 | …)** |
| --- | --- | --- | --- | --- |
| F1 | Allow users to see all cars selling | None | 9 | Sprint 1 |
| F2 | Allow users to search for cars by model name, make, type | F1 | 9 | Sprint 1 |
| F3 | Allow users to sign up for an account | None | 8 | Sprint 1 |
| F4 | Allow user to see a car’s detailed information | F1, F3 | 9 | Sprint 1 |
| F5 | Allow a site admin to log in to separate admin portal | None | 9 | Sprint 1 |
| F6 | Allow admin to add/remove car(s) to the website | F5 | 9 | Sprint 1 |
| F7 | Allow admin to edit a car’s information (name, make, model, price,...) | F5 | 9 | Sprint 1 |
| F8 | Allow admin to see all users’ basic information | F5, F3 | 9 | Sprint 1 |
| F9 | Allow admin to see a user’s detailed information | F5, F3 | 8 | Sprint 1 |
| F10 | Allow user to see their own information | F3 | 9 | Sprint 2 |
| F11 | Allow user to edit their own information | F3 | 7 | Sprint 2 |
| F12 | Allow an user to have their own cart |  | 8 | Sprint 2 |
| F13 | Allow an user to add a car to their cart | F12 | 9 | Sprint 2 |
| F14 | Allow an user to see the cars in their cart | F13 | 9 | Sprint 2 |
| F15 | Allow an user to head to checkout with the items in the cart | F14 | 9 | Sprint 2 |
| F16 | Allow an user to checkout with Credit Card and Debit Card information | None | 9 | Sprint 3 |
| F17 | Allow an admin to view all transactions | F16 | 9 | Sprint 3 |
| F18 | Allow an admin to search transactions by including but not limited to price, customer, name, car, make, model, date, … | F17 | 9 | Sprint 3 |
| F19 | Allow an user to view their own past transactions | F16 | 8 | Sprint 3 |
| F20 | Allow an user to cancel their own pending transactions | F19 | 8 | Sprint 3 |
| F21 | Allow an user to receive an email update for their transactions’ state | F19 | 8 | Sprint 3 |
| F22 | Allow an user to request a refund for their transaction | F20 | 8 | Sprint 3 |
| F23 | Allow an user to contact customer support | F3 | 7 | Sprint 3 |

**Solution Direction**

The chosen solution direction for the project is to develop a web-based application using the ASP.NET Core MVC framework and the Microsoft SQL Server database. The web application will consist of three tiers: presentation, business, and data. The presentation tier will handle the user interface and interaction, the business tier will contain the application logic and functionality, and the data tier will manage the data storage and retrieval. The web application will be hosted on the Microsoft Azure cloud platform, which will provide scalability, reliability, and security for the project.

The web-based application solution direction was chosen for the following reasons:

* It aligns with the project scope of re-designing and optimizing the online presence of the company, as it will provide a modern and professional website that can be accessed by users from anywhere and anytime.
* It meets the quality management criteria of functional suitability, usability, and reliability, as it will use the ASP.NET Core MVC framework, which is a robust and versatile technology that supports various features and functionalities, such as data validation, authentication, authorization, routing, etc. The framework also follows the Model-View-Controller (MVC) design pattern, which separates the concerns of the application and facilitates the development and maintenance of the software. The Microsoft SQL Server database is a reliable and secure data management system that can store and manipulate large amounts of data efficiently and effectively. The Microsoft Azure cloud platform is a leading cloud service provider that offers various benefits, such as scalability, availability, fault tolerance, backup, recovery, etc.
* It leverages the existing skills and expertise of the development team, as they are familiar with the Microsoft technologies and tools, such as Visual Studio, C#, HTML, CSS, JavaScript, etc. This will reduce the learning curve and increase the productivity and quality of the software.

## Alternatives and Rationale

The following table summarizes the alternatives that were considered and discarded for the project, along with the reasons for their rejection.

Table

| Alternative | Description | Reason for Rejection |
| --- | --- | --- |
| Mobile application | A native or hybrid mobile application that can be installed and run on mobile devices, such as smartphones and tablets. | A mobile application would limit the accessibility and reach of the website, as it would require the users to download and install the application on their devices. It would also increase the complexity and cost of the project, as it would require the development and maintenance of different versions of the application for different platforms, such as iOS, Android, etc. |
| WordPress website | A website that is built and managed using the WordPress content management system (CMS), which is a popular and widely used platform for creating and maintaining websites. | A WordPress website would not provide the flexibility and customization that the project requires, as it would rely on the predefined themes, plugins, and features that WordPress offers. It would also pose security and performance issues, as WordPress is prone to hacking and malware attacks, and may not be able to handle the high volume and complexity of the data and transactions that the project involves. |
| PHP and MySQL website | A website that is developed using the PHP scripting language and the MySQL database, which are open-source and widely used technologies for web development. | A PHP and MySQL website would not match the quality and standards that the project demands, as PHP and MySQL are outdated and obsolete technologies that have many drawbacks, such as poor performance, lack of security, inconsistency, etc. They would also not integrate well with the Microsoft technologies and tools that the development team is accustomed to. |

High Level Design

The presentation tier is responsible for the user interface and interaction of the web application. It consists of the following components:

* Views: The views are the web pages that display the content and layout of the website, such as the home page, the car catalogue page, the trading page, etc. The views are written in HTML, CSS, and JavaScript, and use the Razor syntax to embed C# code and data.
* Controllers: The controllers are the classes that handle the user requests and responses, such as the HomeController, the CarController, the TradeController, etc. The controllers are written in C# and use the ASP.NET Core MVC framework to implement the application logic and functionality, such as data validation, authentication, authorization, routing, etc.
* Models: The models are the classes that represent the data and business entities of the website, such as the Car, the Customer, the Trade, etc. The models are written in C# and use the Entity Framework Core (EF Core) to map the classes to the database tables and perform the data operations, such as adding, updating, deleting, and querying the data.

The business tier is responsible for the application logic and functionality of the web application. It consists of the following components:

* Services: The services are the classes that provide the core business logic and functionality of the website, such as the CarService, the CustomerService, the TradeService, etc. The services are written in C# and use the ASP.NET Core MVC framework to implement the business rules and algorithms, such as calculating the car prices, generating the sales reports, managing the inventory, etc.
* Repositories: The repositories are the classes that abstract the data access and manipulation from the services, such as the CarRepository, the CustomerRepository, the TradeRepository, etc. The repositories are written in C# and use the EF Core to communicate with the database and perform the data operations, such as adding, updating, deleting, and querying the data.

The data tier is responsible for the data storage and retrieval of the web application. It consists of the following components:

* Database: The database is the Microsoft SQL Server database that stores and manages the data of the website, such as the car records, the customer records, the trade records, etc. The database consists of various tables, such as the Car, the Customer, the Trade, etc., that store the data in a structured and relational manner.
* Cloud: The cloud is the Microsoft Azure cloud platform that hosts and runs the web application and the database, providing scalability, reliability, and security for the project. The cloud consists of various services, such as the App Service, the SQL Database, the Storage Account, the Key Vault, etc., that offer various benefits, such as scalability, availability, fault tolerance, backup, recovery, etc.

**Quality Management**

* **Functional Suitability**: The software should meet the functional requirements specified by the client, such as adding, updating, deleting, and searching for car records, generating sales reports, managing inventory, etc. The quality metrics for this characteristic are:
  + Number of errors found in testing: The software should have less than or equal to 5% of the total test cases fail due to functional errors.
  + Number of defects per KLOC: The software should have less than or equal to 5 defects per thousand lines of code (KLOC) related to functional issues.
* **Usability**: The software should be easy to use, learn, and operate by the end-users, such as car dealers, customers, and managers. The quality metrics for this characteristic are:
  + User satisfaction: The software should achieve a high score (at least 4 out of 5) on a user satisfaction survey that measures the aspects of usability, such as efficiency, effectiveness, learnability, and satisfaction.
  + Task completion time: The software should enable the users to complete the common tasks, such as adding a sales record, searching for a car, or generating a report, within a reasonable time (less than 5 minutes).
* **Reliability**: The software should perform consistently and correctly under normal and abnormal conditions, such as high load, network failure, or invalid input. The quality metrics for this characteristic are:
  + Availability: The software should be available for use at least 99% of the time, meaning that the downtime should be less than 1% of the total operating time.
  + Fault tolerance: The software should be able to recover from errors and resume normal operation within a short time (less than 1 minute).
* **Security**: The software should protect the data and the system from unauthorized access, modification, or deletion, such as hacking, phishing, or malware. The quality metrics for this characteristic are:
  + Number of security breaches: The software should have zero security breaches that compromise the confidentiality, integrity, or availability of the data or the system.
  + Number of security vulnerabilities: The software should have zero security vulnerabilities that can be exploited by malicious actors, such as SQL injection, cross-site scripting, or buffer overflow.
* **Maintainability**: The software should be easy to modify, test, and deploy by the developers, such as adding new features, fixing bugs, or updating the system. The quality metrics for this characteristic are:
  + Code readability: The software should follow the coding standards and conventions that make the code easy to read, understand, and maintain, such as consistent indentation, naming, and documentation.
  + Code complexity: The software should have a low cyclomatic complexity, which measures the number of linearly independent paths through the code, such as branches, loops, or conditions. The software should have an average cyclomatic complexity of less than 10 per function or method.

**Resources**

**Pham Anh Vu**

**Solutions, IT Architect**

Specializes in AWS and Azure, with 8 years of experience in deploying scalable cloud solutions. Known for optimizing cloud costs and implementing serverless technologies, he has led the cloud migration of high-traffic platforms, showcasing his capability to manage demanding cloud environments.

**Pham Duc Linh**

**Product Owner - BA**

With a background in product management and a keen eye for market trends, Linh has 4 years of experience in aligning project goals with customer needs. He excels in roadmap planning and stakeholder communication, ensuring projects are customer-focused and market-driven.

**Nguyen Thanh Dat**

**Project Manager - Scrum Master**

Certified Scrum Master with 5 years of experience in fostering Agile environments. Skilled in enhancing team productivity and removing project impediments.

**Phung Xuan Tung**

**Lead Developer (FE)**

6 years of experience in front-end development, skilled in React and responsive design

**Tran Tuan Nam**

**Lead Developer (BE)**

5 years in back-end development, specializes in Node.js and database management

**Approval Signatures:**

**Project Team**

|  | Name of student | Student Id | Signature |
| --- | --- | --- | --- |
| 1 | Pham Duc Linh | 103792371 |  |
| 2 | Nguyen Thanh Dat | 103804881 |  |
| 3 | Phung Xuan Tung | 103792054 |  |
| 4 | Tran Tuan Nam | 103792643 |  |
| 5 | Pham Anh Vu | 103806447 |  |

**Project Sponsor [Your Tutor]**

| Tutor’s name (on behalf of the client) | Signature: |
| --- | --- |
| Pham Thi Kim Dzung |  |