

TechM Capstone Project Assignment

Vehicle Service Management

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# OBJECTIVES (High-level Problem Description):

Design and develop an end-to-end multi-tiered web-based solution for **Vehicle Service Management**, implementing the expected functionalities as described in the deliverables through application of conceptual and practical knowledge of .NET Back-end (C#, ASP.NET MVC, ASP.NET Web API, Entity Framework, SQL Server, Microservices) and suitable Front-end technologies (HTML5, CSS3, BootStrap, jQuery, Angular / React).

# Skills Required

The participant should have knowledge of:

* .NET Back-End: C#, ASP.NET Core MVC, ASP.NET Core Web API, Entity Framework, SQL Server, Microservices
* Front-End: HTML5, CSS3, jQuery, Bootstrap, Angular (or React)
* Tools: Visual Studio, Node.js/NPM, GIT, Jenkins, Docker

# Expected Design Features

The participants should be able to demonstrate their ability to develop an Angular / React, REST API, Spring Boot application with the following elements:

* Single Page Application (SPA) using Angular with REST callbacks for data access
* Responsive Web Design using Bootstrap
* Models, Routes, Views and Controllers with ASP.NET MVC
* Well-designed Database Tables and Parameterized Stored Procedures if RDBMS is used
* CRUD REST API functionality with ASP.NET Web API
* Authentication and Authorization

# Estimated Efforts/Duration

* Duration: 48 hours
* Acceptable deviation: 20% (due to scope change, technology/lab environment hurdles/dependencies etc.) through approval of design documentation and related evidences.
* Team Size: 2-4

# Background of the Project in Detail

Prime Automobiles Pvt.Ltd. is a car sales and service company in Pune. They need to use an application for tracking sold vehicles' service history and initiate scheduled servicing with the customers. The application needs to maintain details about Vehicles, Customers, Service Records, Bill of Material and Service Representatives.

# Roles & Responsibilities, Business Rules, UI-Specifications

There will be two types of Users - Admin and Service Advisor.

**Functionality for Admin user:**

Upon starting up, the application will show a list of vehicles which are due for servicing in the current week, list of vehicles which are currently under servicing and list of vehicles serviced with status information.

Admin can select a vehicle which is due for servicing and schedule it for servicing with a selected Service Advisor.

Once the Service Advisor completes the servicing, the record should be available for Admin to print invoice, process payment and dispatch.

Admin can also create/update/delete/search on the Master data of Vehicles, Customers, Service Representatives and Work Items (Engine Oil, Fuel Filter, Service Charges etc)

**Functionality for Service Advisor:**

Upon starting up, the application will show a list of vehicles which are scheduled for servicing by Admin.

SA will add the items to the Bill of Material attached with the Service Record e.g. Oil change, Wheel alignment, Fuel filter change etc along with quantity and will complete the service record. This record is now ready for admin to process payment. (The cost of the items is pre-decided which SA cannot change)

# Deliverables By Candidate

* Implementation of the functionalities as per the Business requirement and scope
* *Complete application source code on Github (optional)*
* Deployed and working application hosted on any cloud environment
* All functionalities must be unit-tested and automated functionally tested
* *Source code versioning (Github), use of Continuous integration toolchain (Optional)*
* *Host on any Azure cloud platform (Optional)*
* All input fields to be validated based on the business rules
* Implement appropriate security features (secure coding, authentication/authorization)
* Appropriate Exception handlers to be implemented wherever necessary/applicable

# Resources & Tools Required

* Environment : Visual Studio Community Edition
* Database : SQL Server
* Programming Language : C#, TypeScript
* Frameworks : ASP.NET MVC, Web API, Entity Framework, Angular
* DevOps Tools : GIT, NUGet, Jenkins, Selenium, Docker

# Detailed Evaluation Criteria

* Demo of the application
* Code Walkthrough
* Presentation & Viva

Evaluation Parameters:

|  |  |
| --- | --- |
| **Functionality** | **Weightage** |
| Implementation of Single Page Application (SPA) front-end functionality with REST API calls | 25% |
| Implementation of Responsive Web Design | 5% |
| Implementation of Back-end CRUD REST API functionality | 30% |
| Well-designed Database Tables and Parameterized Stored Procedures | 20% |
| Implementation of Role-based Authentication and Authorization | 20% |

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