Project Report

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| Project Title | Design, Develop, Implement, Test & Document Used Car Sales Portal Website |
| Module Name | Application Development & Process |
| Course Name | Applied Degree in Software Engineering |
| Project Start Date | 27 November 2022 |

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| Ida Bagus Ketut Yoghantara | |  | |
| Date issued | Completion date | | Submitted on |
| 21 November 2022 | 12 December 2022 | | 12 December 2022 |
|  | |  | |
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| Learner declaration |
| I certify that the work submitted for this assignment is my own and research sources are fully acknowledged.  Student signature:  Date: 27 November 2022 |

Content

1. Project background
2. Project Objectives
3. Project Requirement Specifications
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Project Background

You have been approached by ‘ABC Cars Pte Ltd’ as a website developer to develop  
a Used Car Sales portal. Users will be able to register in the portal using the  
Registration Page. Users of the portal can search for Cars using Make, Model, Registration & Price Range. Users will be able to view the Car information after  
searching them. The portal allows users to login, post Car for sale.

Project Objective

There are 2 types of users in this Used Cars Sales portal. They are

* Users
* Administrator

Users should be able to perform following functions in the portal

* Register in the Portal
* Login to the Portal
* Post a Car for Sale along with Picture upload
* Deactivate an Existing car sale
* Update their Profile after logging in.
* Book an appointment for test drive
* Post the bidding price

Administrators should be able to perform the following functions in the  
portal

* Register in the Portal
* Login to the portal
* View List of Registered Users
* Mark a User as Administrator
* Activate / Deactivate a Car post
* Update their profile
* Approve or deny the users appointment based on the bidding
* Transact the sales if price is right

Both Users & Administrator

* Visit Home Page
* View Car Listing
* Search for a Car by Make, Model, Registration Year & Price Range
* About Us Page
* Contact Us Page

The scope of this project is to create a testing plan and strategy to appreciate the  
requirements for implementing RBT as a system testing methodology clearly and  
concisely.

Tools & platform used

1. Microsoft Word
2. Microsoft Power Point
3. Visual Studio Code
4. Spring Tool Suite 3.9.11
5. Diagram.net
6. Ngrok

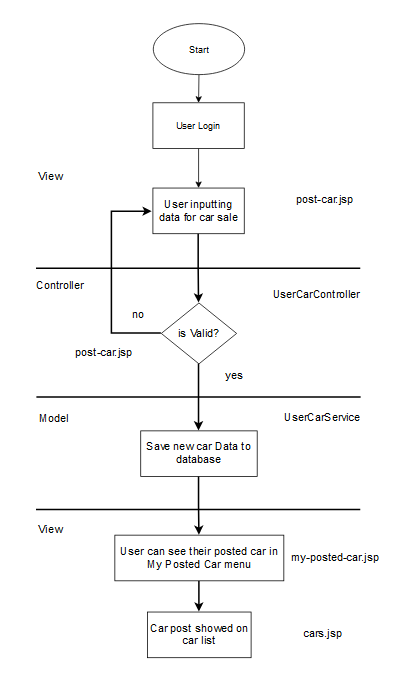
Task 1

Task Statement:

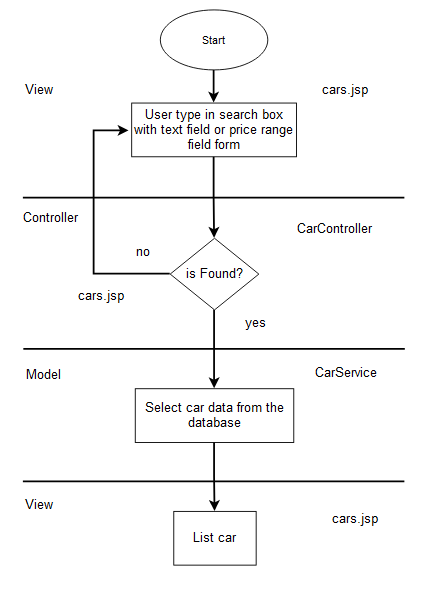
1. Explain the Business Processes the Software is supporting
2. Document 2 Business Process
3. Document 2 Module functionality
4. UI Screenshots
5. Functionality of each of the Screen

Solution:

1. Document 2 Business process
2. Post Car

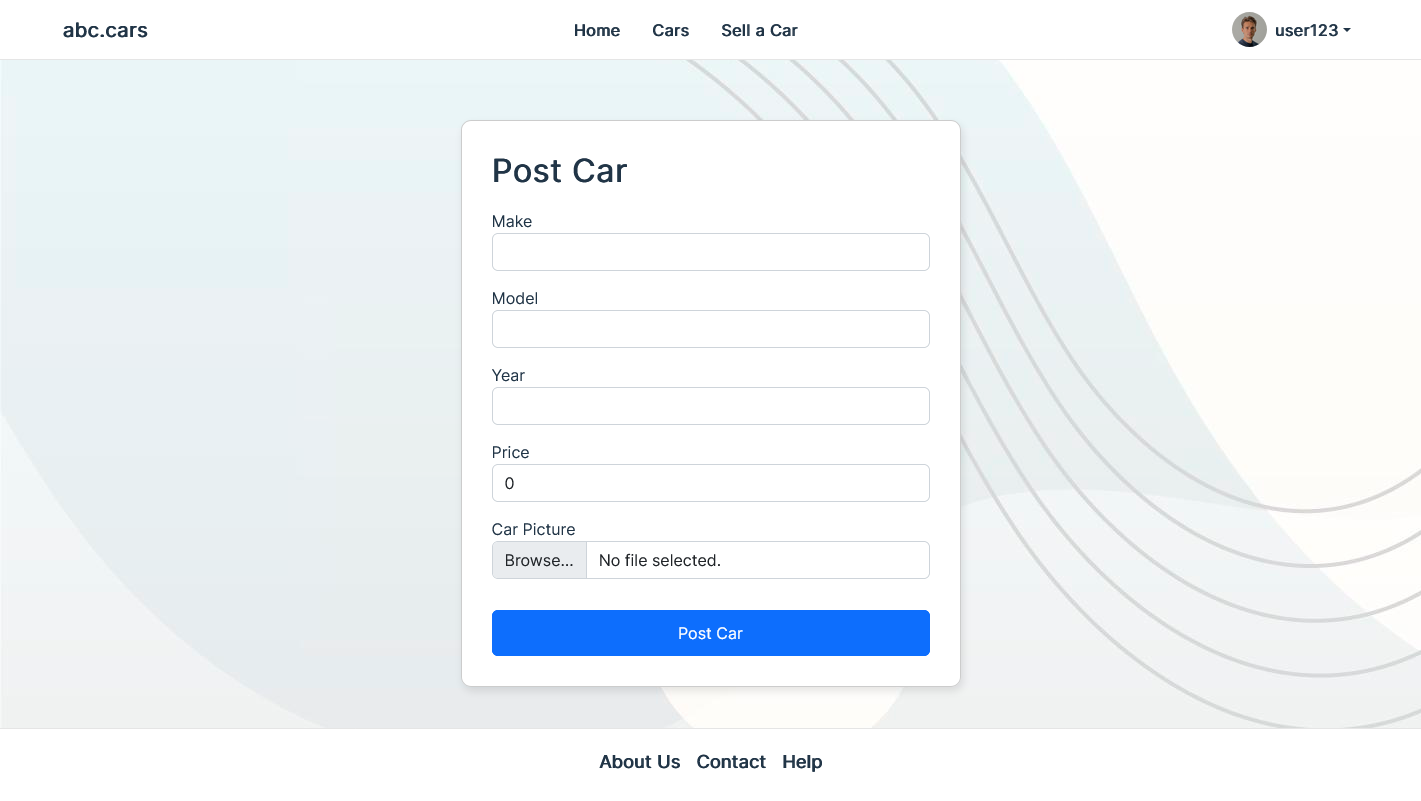


1. Search Car



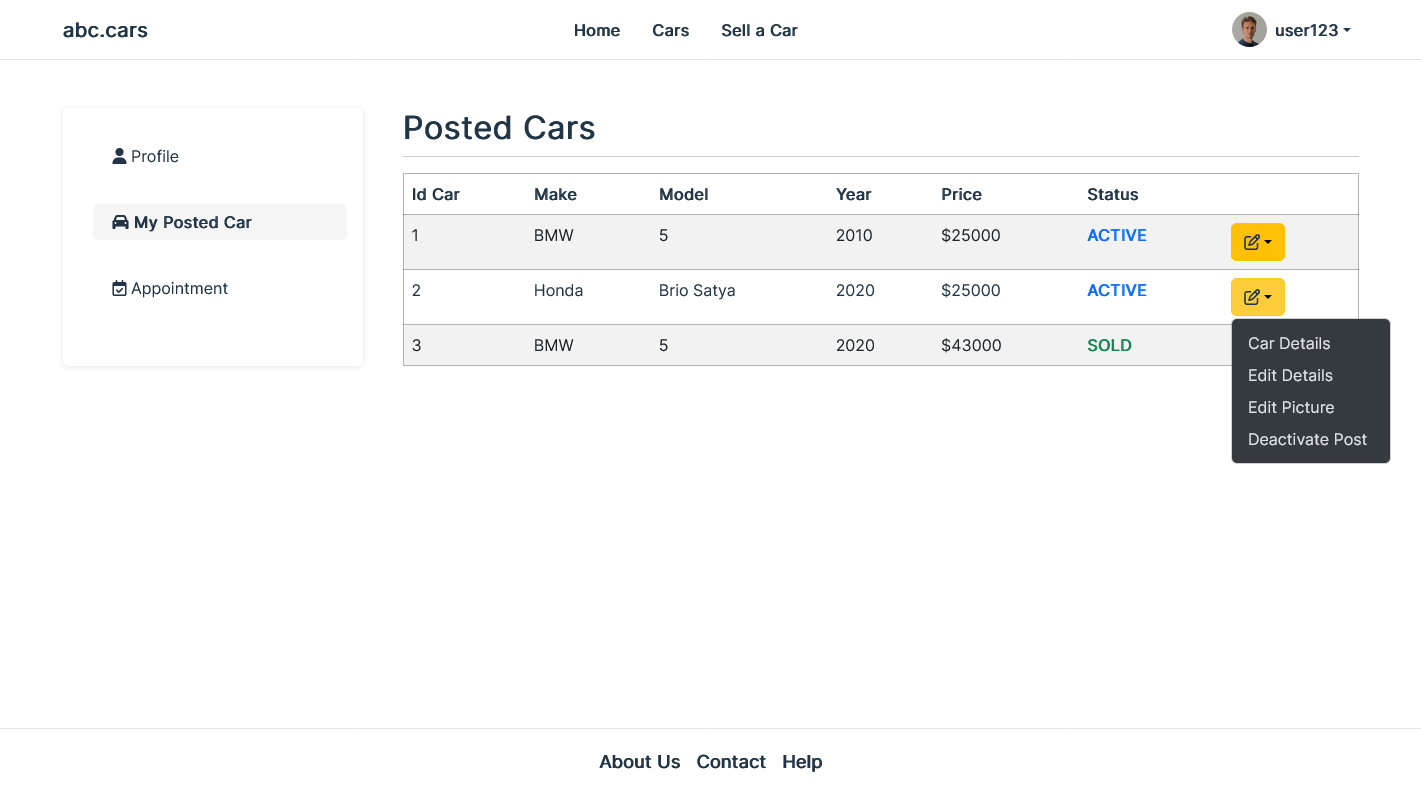
1. UI Screenshot and functionality
2. Car Post

Post Car Form



Functionality: For user whom want to post their car to sale on the website

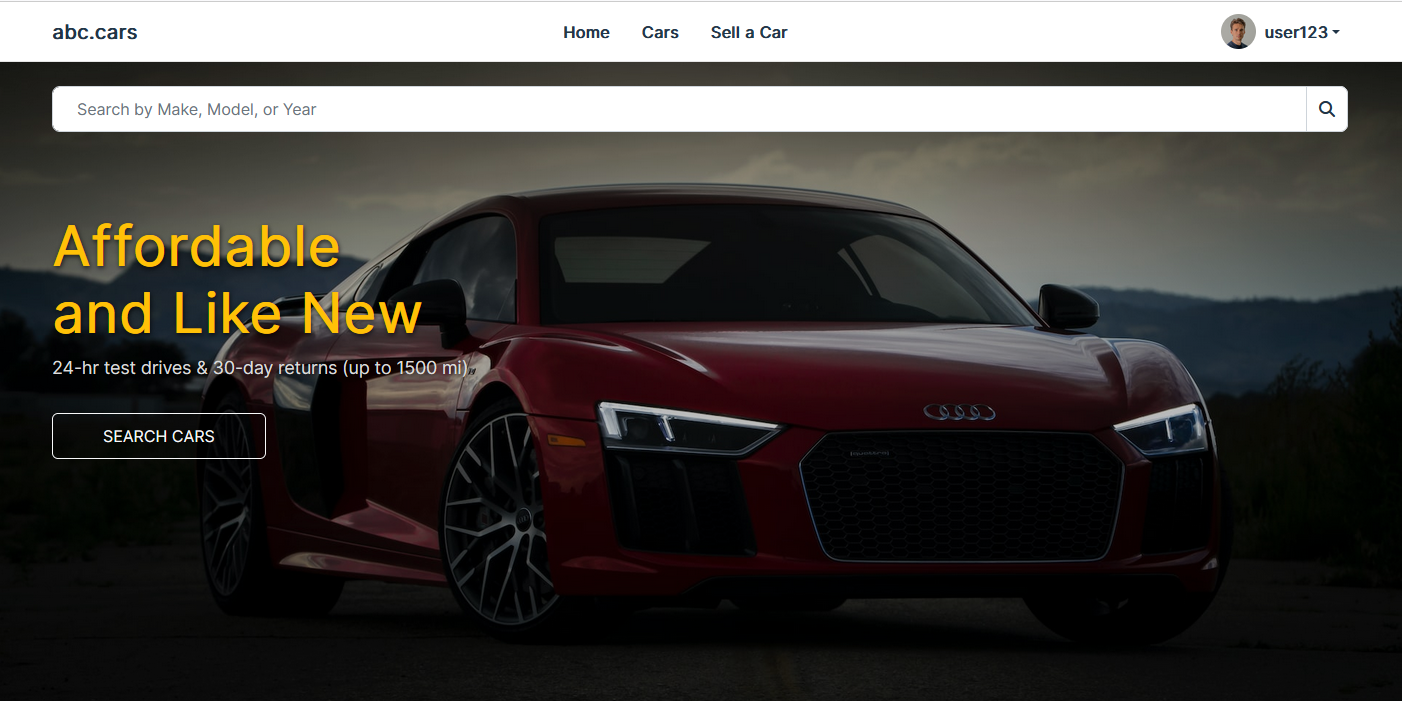
My Posted Car Menu

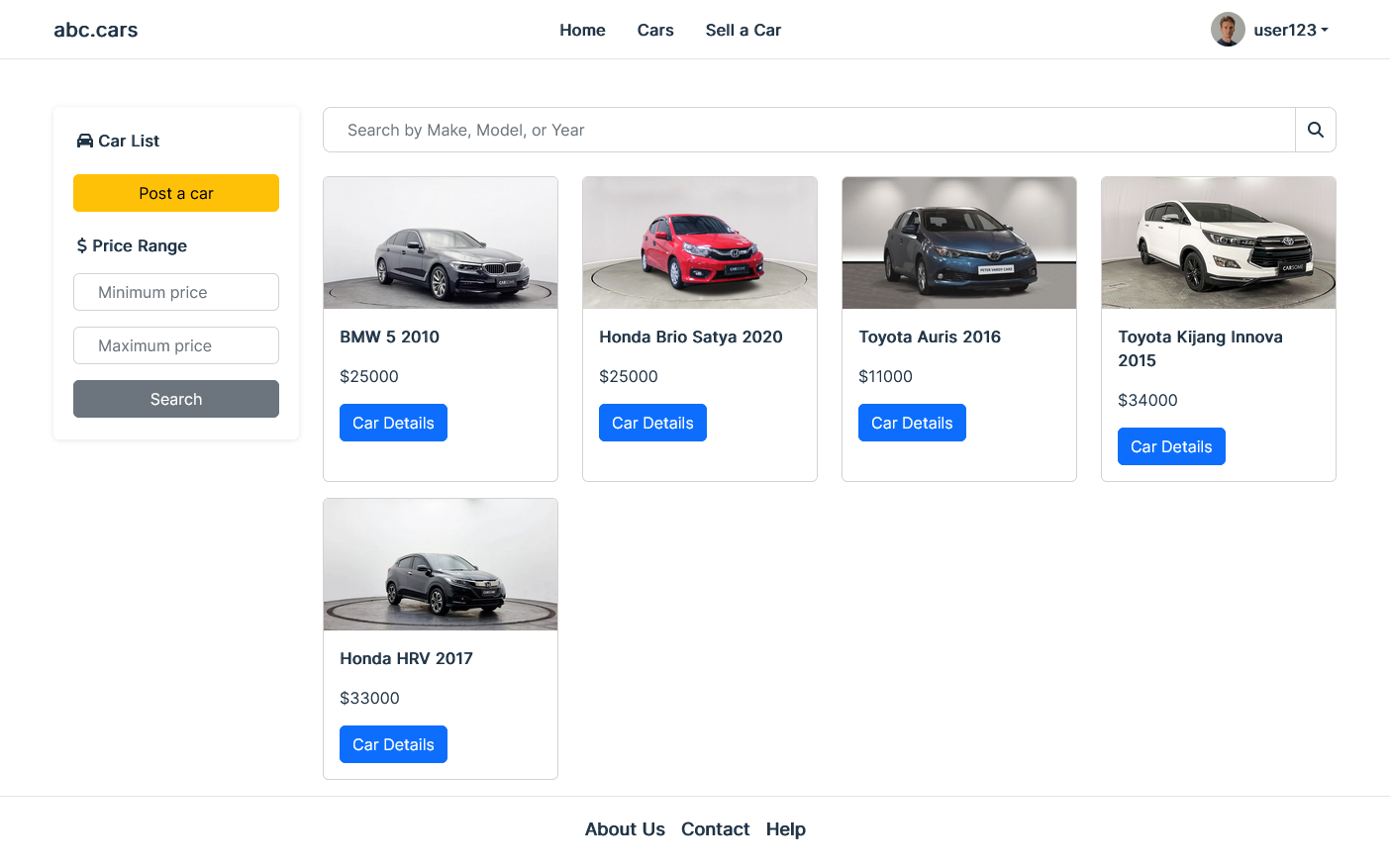


Functionality: List of users posted car and management section for user posted car

1. Search Car

Search Car form





Functionality:

1. Search by keyword: User can search car by “Make, Model, or Year” of desired car
2. Search by price range: User can search car by the price range of the car price

Task 2

Task Statement:

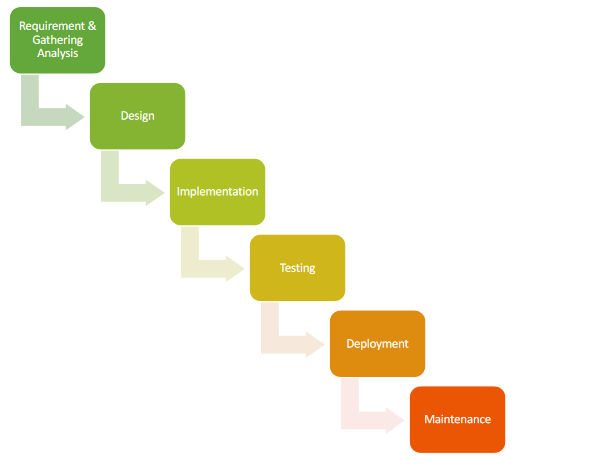
1. Detail the Software Development Methodology to be used for developing system
2. List the various tasks to be done during various phases
3. Create the Project Plan detailing the various steps to be carried out along with dates and Timelines

Solution:

1. Software development methodology to be used

Waterfall Model

The waterfall model is a breakdown of project activities into linear sequential phases, where each phase depends on the deliverables of the previous one and corresponds to a specialization of tasks. The approach is typical for certain areas of engineering design.



1. List various task to be done during various phase
2. **Requirement & Gathering Analysis**
3. Identify ABC Company as a client and stakeholder.
4. Arrange project kick off meeting and gather requirement from client and the stakeholders.
5. Gather the list project requirements from client.
6. **System Design**
7. List Of technical requirement
8. Hardware requirement
9. Software Requirement
10. Database Requirement
11. Prepare the prototype

* Business Process Diagram
* Wireframe
* Storyboard

1. Database Design

* Planning and System definition
* ER Diagram

1. **Implementation**

* Writing all the codes to make the website
* Creating database according to ER diagram
* The portal consists of the following Key pages (For Reference)
  + Home Page
  + Registration Page
  + Thank You Page
  + Login Page
  + User Profile Page
  + Edit Profile Page
  + List Car Page
  + Car Details
  + Search Car Function
  + About Us
  + Contact Us
  + Car Bidding
  + Posting Car
  + Administrator Dashboard

1. **Testing**

* Capture the test case document to perform testing
* Ensuring developed software solves the needs addressed and gathered during requirement gathering

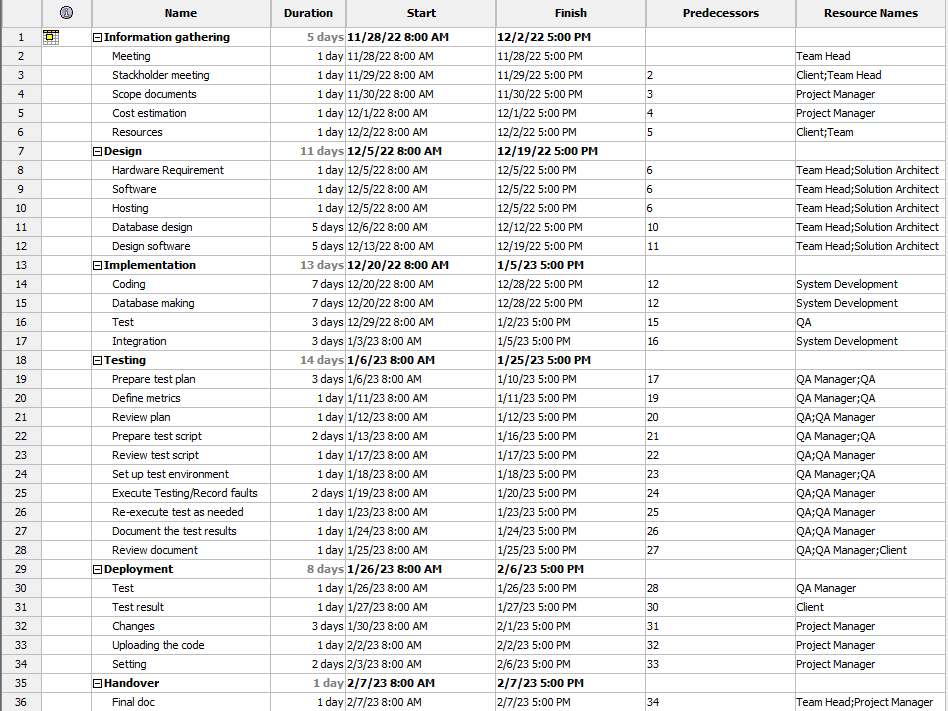
1. **Deployment**

* Uploading all the files to the server
* Configuration of the server
* Beta testing by customer or client
* Sign-off by customer and final deployment in production environment

1. **Maintenance**

* Fix bugs
* Support and hand holding to application users

1. Project plan with dates and timelines



Task 3

Task Statement:

1. Explain risk-based testing concepts and requirements with the following details
2. Stages involved in RBT model
3. Types of risks and its impact

Solution:

1. Stages involved in RBT Model
2. What is the risk?

Risk Management is a multi-step process that identifies and evaluates any emerging threats or risks, whether internal or external, to a business’ information systems and data. It is essential to maintain a risk management process because it reveals all potential threats within the business, whether they already exist or before they generate a negative impact.

1. RBT Stages

* Risk identification

Identify as many of these risk factors as possible. Anything that can harm your organization should be on your radar, including natural disasters, technological risks, and single point of failure (SPOF) risks.

* Plan risk strategy

A risk management strategy provides a structured and coherent approach to identifying, assessing and managing risk.

* Assess risk

Identify hazards and risk factors that have the potential to cause harm

* Mitigate risk

If a risk presents an unwanted negative consequence, you may be able to completely avoid those consequences

* Report risk

A risk report is a summary that describes the potential risks a company may face.

* Predict risk from the lesson learned

Risk Analyser adds extra discipline to performance measurement and project control. It provides reporting that shows you where to focus resources, how to justify expenditure on mitigation actions, and brings managers the confidence that project success

1. Types of risks and its impact

|  |  |  |  |
| --- | --- | --- | --- |
| * + **Type of Risk** | * + **Risk Identification** | * + **Risk Description** | * + **Impact** |
| Functional | * + Login Risk | * + User unable to login | * + If user can’t login to the website they can’t post or bid car to buy a car |
| * + Registration Risk | * + User unable to register to the website | * + If user not able to register then user doesn’t have a account to login to the website |
| * + Post Car | * + User not able to post a car on the website | * + If user not able to post a car then they can’t use the website features to sell their car on the website |
| * + Update Profile | * + User not able to update/edit their profile detail | * + If user not able to edit their profile, they might be using wrong profile detail and not able to change their profile |
| * + Search Car | * + User unable to search car by keyword or by price range | * + If user unable to search car by keyword or by price range then user can’t find the car of their desired requirements |
| Non – Functional | * + Performance Effiency | * + Cars list page is not loading properly and there is picture of car not loaded | * + User can’t see the content of the cars list |
| * + Compatibility | * + Website has different look and feel into different browser | * + User that using different web browser has different experience and might be ruin their experience on the website |
| * + Usability | * + User is finding very difficult on accessing the features on the website like post car, bid car, search car | User will confuse and will not able to use the website properly as it should be |
| * + Security | * + User can access all the content even they don’t have the authorization | * + If user has access to forbidden features without authorization they may delete all the information or using the data to abuse something illegal |
| * + Maintainablity | * + Fixing small bugs and maintaining the website to work | * + Website will be better as the time goes |

1. Task 4

Task Statement

1. Establish the test phases of security testing with its prioritization
2. Develop the detailed test plan with test cases based on quantitative risk analysis
3. Create a test risk matrix with the evaluation of the impact

Solution

1. Establish the test phases of security testing with its prioritization
2. Risk Based Test Strategy in ABC Car Sale website.
3. What is security testing

Security testing is a process to uncovers vulnerabilities and efforts to prevents threats to interrupting the system.

1. Types of security testing

* Vulnerability Scanning

Is a process to scan a system which could inform any know vulnerability signatures. Scanning process usually done automatically by using related softwares.

* Security Scanning  
  Is a process to scan the network environment allowing the system to notice its weakpoints throughout network system. Scanning process could be taken manually or automatically.
* Penetration Testing

This kind of testing simulates an attack from a malicious hacker. This testing involves analysis of a particular system to check for potential vulnerabilities to an external hacking attempt.

* Risk Assessment.

This testing involves analysis of security risks observed in the organization. Risks are classified as Low, Medium and High. This testing recommends controls and measures to reduce the risk.

* Security Auditing

This is an internal inspection of Applications and Operating systems for security flaws. An audit can also be done via line-by-line inspection of code

* Ethical Hacking

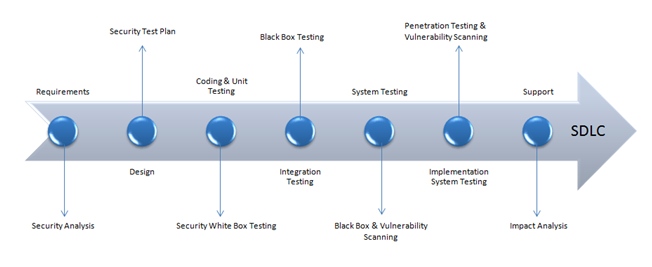
It’s hacking an Organization Software system. Unlike malicious hackers, who steal for their own gains, the intent is to expose security flaws in the system.

* Posture Assessment

This combines Security scanning, ethical hacking and Risk Assessments to show an overall security posture of an organization.

1. Among test strategies, how to carry out security testing.

ABC Car Sale risk assessment could be classify with 3 categorization from Low, Medium, to High. Within every risk categorization have their own priority.

1. Test phases in security testing
2. Develop the detailed test plan with test cases based on quantitative risk analysis
3. Quantitative risk analysis
4. Functional Testing - UAT Test (5 cases).
5. Compatibility - Cross Browser Testing.
6. Performance - Load Testing / Stress Testing.
7. Usabillity - Prototyping.
8. Security - Security Testing / Spring Security.

* SQL Injection
* Logging
* Authentication and Authorization

1. Portability - Multi Platforms.
2. Reliability - Usability
3. Maintainability - Dependency Injections / JUnit Testing
4. Test Cases
   * + 1. Functional Testing

* Check register functionality
* Check all links work
* Check the search functionality works as it should
* Check the data send to database is working properly
* Check the form validation working properly
  + - 1. Compatibility
* Check the website working properly on google chrome
* Check the website working properly on mozilla firefox
* Check the website working properly on microsoft edge
  + - 1. Performance
* Check the pages loaded as it should be
  + - 1. Usability
* Check the user experience on the website, it should be easy for user to use all the features
  + - 1. Security
* Checking Authentication and Authorization
  + - 1. Portability
* The website is able to run on different screen size and different device without comprimising feature,design, and function

1. Create a test risk matrix with the evaluation of the impact
   * + - 1. How risk evaluation is conducted

* Identify risks
* Create action plans
  + - * 1. Develop a test risk matrix for given specification

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| --- | --- | --- | --- | --- | --- | --- |
| Risk ID | Risk | Likelihood  (1-5) | Impact  (1 – 5) | Type of  Testing | Risk  Rating | Risk Level |
| 1 | Data not getting into the database | 3 | 4 | Functional Testing | 12 | High |
| 2 | Empty fields are getting into the database | 5 | 4 | Functional Testing | 20 | Extreme |
| 3 | The name fields are taking numbers with the characters | 2 | 3 | Functional Testing | 6 | Moderate |
| 4 | Website navigation links not working properly instead going to wrong pages | 2 | 2 | Functional Testing | 4 | Moderate |
| 5 | The button is not working when user is trying to submit | 1 | 5 | Functional Testing | 5 | Moderate |
| 6 | Check the website is not working properly in the google chrome | 2 | 4 | Compatibility Testing | 8 | High |
| 7 | Check the website is not working proper in safari | 3 | 2 | Compatibility Testing | 6 | Moderate |
| 8 | Check the website is not working properly in the Microsoft edge | 2 | 1 | Compatibility Testing | 2 | Low |
| 9 | Pages get loaded in less time or not under 5 sec pages should get load | 4 | 3 | Performance Testing | 12 | High |
| 10 | Check whether the user find easy to run the website | 2 | 2 | Usability Testing | 4 | Moderate |
| 11 | Maintain the code and adding features and updating website is comparatively easy | 3 | 3 | Maintainability t Testing | 9 | High |
| 12 | authentication authorization working properly or not in the website | 3 | 2 | Security Testing | 6 | Moderate |
| 13 | the website is able to run on different screen size and different device without compromising feature, design and function. | 4 | 4 | Portability Testing | 16 | Extreme |

1. Task 5

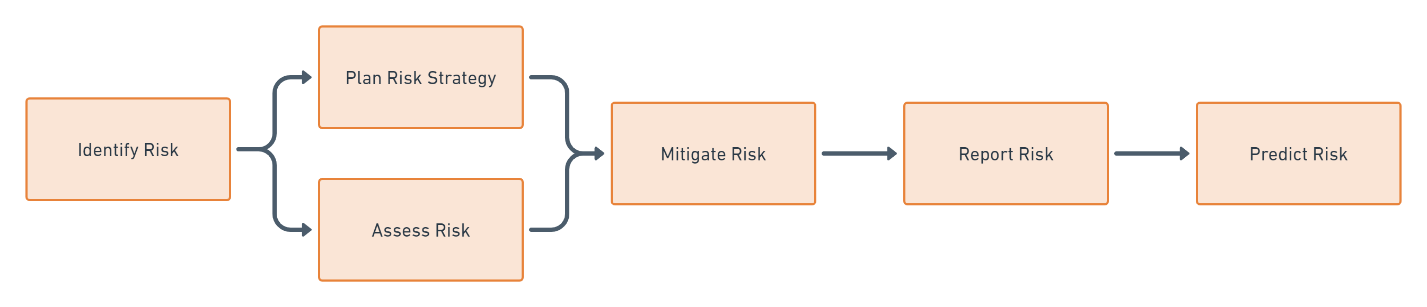
Task Statement

1. Design suitable RBT cycle content and priorities further test cycles
2. Communicate the details of the strategy and test planning to the key stakeholders with proper justifications

Solution

1. Design suitable RBT cycle content and priorities further test cycles

Based on ABC Car Sale website, below are design and explanation of suitable risk base test cycle



1. Identify Risk
2. Plan Risk Strategy and Assess Risk
3. Mitigate Risk
4. Report Risk
5. Predict Risk
6. Communicate the details of the strategy and test planning to the key stakeholders with proper justifications
7. Justification of selected test methods based on project quantified risk

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| --- | --- |
| **Type of Testing** | **Main Purposes** |
| Functionality | The purpose of the test is to ensure if the features based on project requirements are working as intended. |
| Performance | To ensure the performance of the webpages are consistent with the project requirement below 3 seconds. |
| Compatibility | The goal of it to ensure if the website works properly within multiple browsers. |
| Usability | The main purpose is to ensure if the website interfaces are able to be understand and can be accessed to most visitors. |
| Security | Main purpose of the test is to identify any potential threats from external party that would access the website and create exploitation to the website. |
| Portability | The goal is to ensure that the website could be accessed using multiple different devices. |
| Maintainability | The main purpose is to determine how suitable the project for maintenance in difficulty wise. |

1. Communicate the details of the strategy and test planning to the key stakeholders with proper justifications

* Stakeholders Identification of ABC Cars Pte Ltd
* Determine for Communication Tool
* Interview Stakeholders
* Gather Together

1. Task 6

Task Statement:

1. Execute the risk-based test plan and log the test results
2. Modify the risk-based test procedure with the reasons

Solution

1. Execute the risk-based test plan and log the test results
2. UAT Testing

|  |  |
| --- | --- |
| **Test Scenario** | Registration |
| TS001 |
| **Test Cases** | Registration in ABC Cars Sales Portal Website |
| TC001 | Validating data that inpputed into registration form |
| TC002 | After user submmiting correct data it should load a thank you page |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Priority** | **Pre-conditions** | **Expected Result** | **Actual Result** | **Final Result** |
| TS001 | TC001 | High | ABC Cars Sale Portal Website hosted on server | All field is required except “about” field if user enter blank data It should throw an error | As expected | Pass |
| TC002 | High | Load thank you page after submitting data | As expected | Pass |

**Test Data Table**

|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Data** |
| TS001 | TC001 | Username = “ ” (blank or space)  Password = password123 |
| TC002 | Username= gustut  Password = gustut123  Firstname = gustut  Lastname = yoghantara  Phone number = 08111222333  Address = Bali  About = Hello! |

**Test Evidences**

|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Evidences** |
| TS001 | TC001 |  |
| TC002 |  |

|  |  |
| --- | --- |
| **Test Scenario** | Search Car |
| TS002 |
| **Test Cases** | Search Car by keyword or price range |
| TC001 | Search car by keyword (Make, Model, or Year) |
| TC002 | Search car by price range (Maximum price & Minimum Price) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Priority** | **Pre-conditions** | **Expected Result** | **Actual Result** | **Final Result** |
| TS002 | TC001 | Medium | ABC Cars Sale Portal Website hosted on server | Show list car after user search by keyword and showing not found car if there is no car found | Not found condition haven’t created | Fail |
| TC002 | Medium | Show list car after user search by price range, validating input blank and not found car if there is no car within the price range | Not found condition haven’t created and instead showing nothing | Fail |

**Test Data Table**

|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Data** |
| TS002 | TC001 | Keyword : (random words) , BMW, 2022, Kijang Innova |
| TC002 | Price range: $1000 ~ $2000 |

**Test Evidences**

|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Evidences** |
| TS002 | TC001 |  |
| TC002 |  |

1. Security

|  |  |
| --- | --- |
| **Test Scenario** | Authentication and Authorization |
| TS003 |
| **Test Cases** |  |
| TC001 | Validating login user with bad credential |
| TC002 | Check access website from user with role “USER” and user with role “ADMIN” |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Priority** | **Pre-conditions** | **Expected Result** | **Actual Result** | **Final Result** |
| TS003 | TC001 | High | ABC Cars Sale Portal Website hosted on server and create 2 user with role ”USER” and role “ADMIN” | When user inputting wrong username or password it will show error “Username or password invalid” | As expected | Pass |
| TC002 | High | “USER” Role has access to post car, place car bid, appoint test drive,  “ADMIN” Role has access to admin dashboard and website car sales management | As expected | Pass |

**Test Data Table**

|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Data** |
| TS003 | TC001 | Username = error  Password = error123 |
| TC002 | Username = user  Password = user123  Username = admin  Password = admin123 |

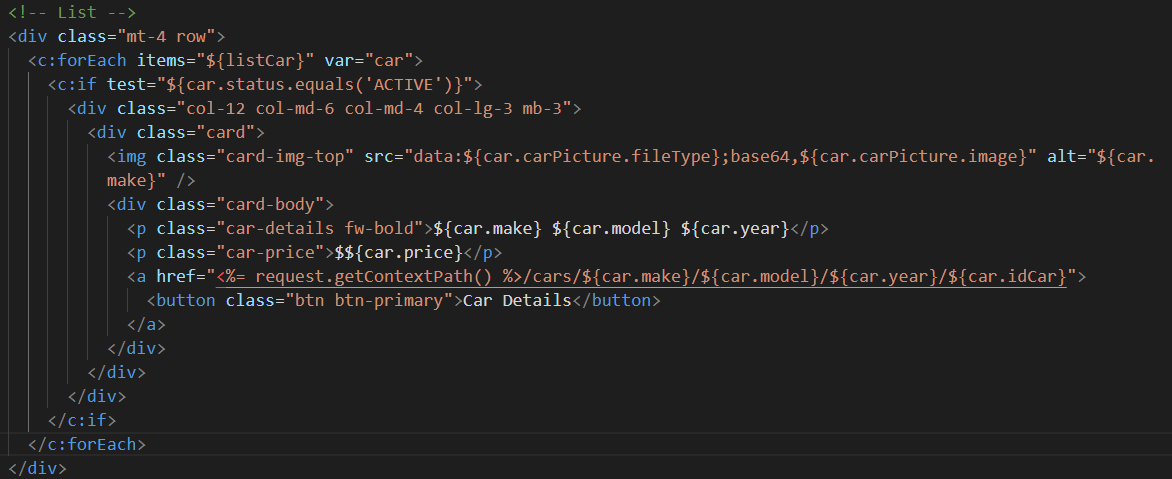
**Test Evidences**

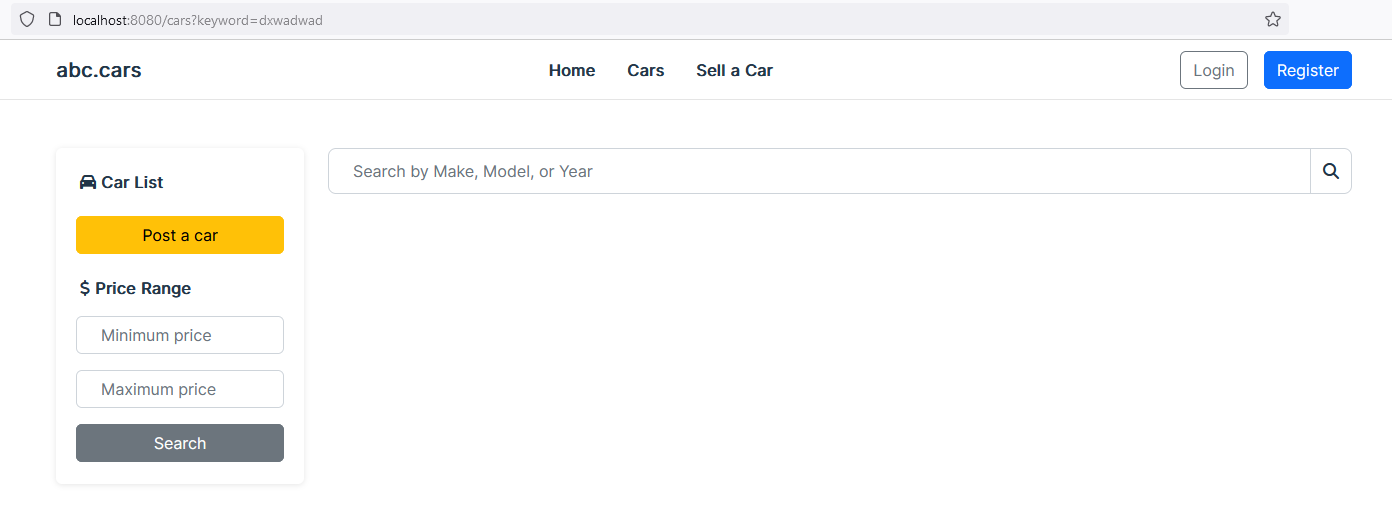
|  |  |  |
| --- | --- | --- |
| **Test Scenario ID** | **Test Case ID** | **Test Evidences** |
| TS001 | TC001 |  |
| TC002 | **USER**  **Post Car**    **Place Car Bid**    **Appoint Test Drive**    **Admin Dashboard (User role)**    **ADMIN**  **Admin Dashboard (Admin role)**    **Car Management (Admin role)** |

1. Modify the risk-based test procedure with the reasons

Adding Not Found Car when searching car with keyword or price range

BEFORE





AFTER

