Electric Vehicle Reservation System

Software Quality Assurance (SQA) Plan

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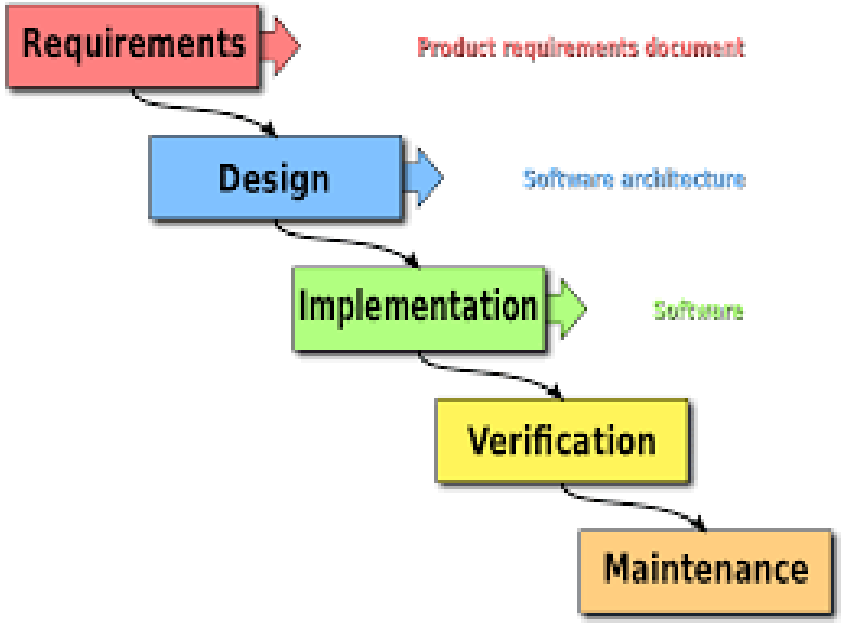
1.0 Purpose

The purpose of this Software Quality Assurance Plan is to establish the goals, processes, and responsibilities required to implement effective quality assurance functions for the Electric Vehicle Reservation System

The Electric Vehicle Reservation System Software Quality Assurance Plan provides the framework necessary to ensure a consistent approach to software quality assurance throughout the project life cycle. It defines the approach that will be used by the Software Quality personnel to monitor and assess software development processes and products to provide objective insight into the maturity and quality of the software.

1.1 Scope

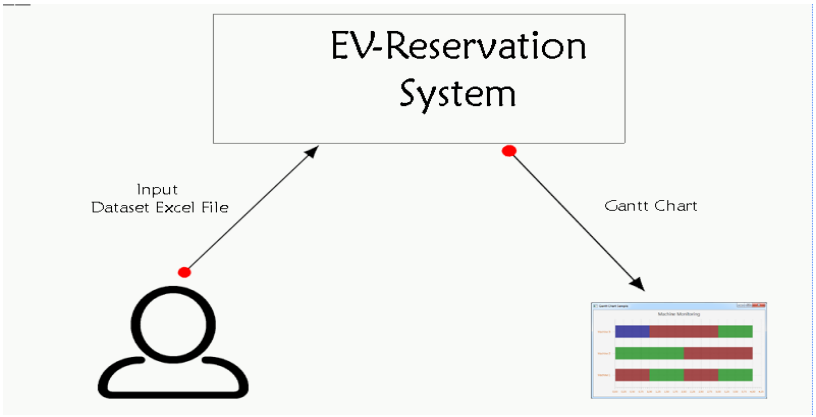
This plan covers SQA activities throughout the all phases of the Electric Vehicle Reservation System development.



1.2 Project Summary

Electric Vehicle Reservation system is a window based java application. It is a single-mode application in which user gives a dataset as an excel sheet input and after processing it system will generate the Gantt chart which represent the allocation of charging ports of different stations.

Electric Vehicle Reservation is an interactive standalone application with graphical interface. The goal is to develop a reservation system using the software engineering processes. Application will be tested with various test cases and techniques. Major purpose is of application is effective utilization of charging stations with respect to the customers. Application does not need any special expertise or skills.



Major Features:

1. Excel file Dataset is loaded
2. Dataset will be processed
3. Gantt chart generated based on processing

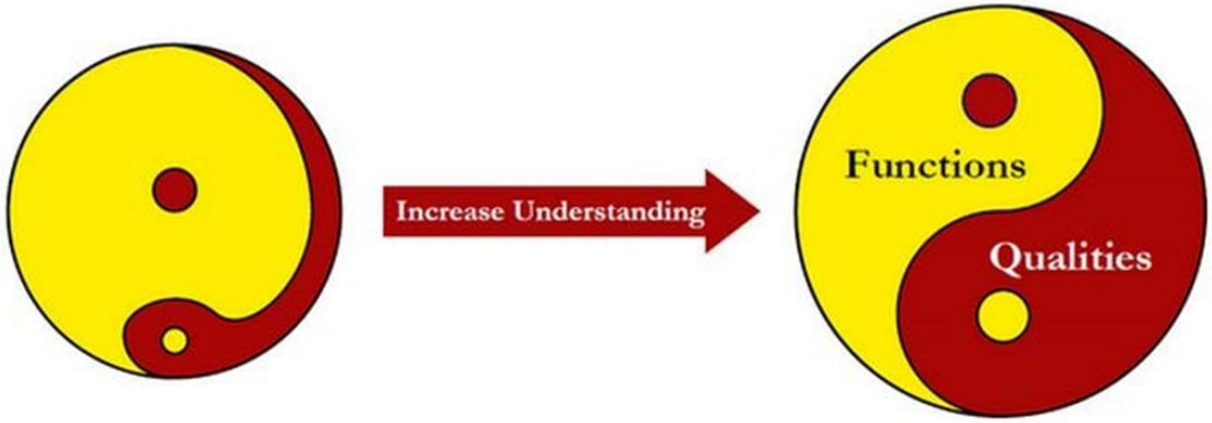
2.0 Reference Documents

The following documents were used or referenced in the development of this plan:

- IEEE STD 730-2002, IEEE Standard for Software Quality Assurance Plans
- Electric Vehicle Reservation System Software Requirement Specification Document
- Electric Vehicle Reservation System Software Development Plan
- Electric Vehicle Reservation System Statement of Work

3.0 Quality Goals and Expectations

Many developers and engineers underestimates the quality goals which endangers the project results later. Websites are failed to handle the large scale of requests. This is because of over emphasis on functionalities rather than



Goal: To make functions and qualities equal important

Quality has different perspectives like user satisfaction, good quality and within the budget and schedule. Here are some quality goals to make system reactive like:

1.Responsiveness: The goal of responsiveness is to make system always available. Whenever user need to do reservations system should be available.
To implement such a system which will fulfills the user expectations all the time.

2.Resilient: This is the feature to make system error tolerant. For example, if user enters something, wrong does not crash, if there is one component is not working of the system then other should be responsive. It will not be like if one component has some problems whole system will not show up. Goal is to make system reliable and fault tolerant.

3.Scalable: The goal is to make system elastic. It means that how many users request for reservation or to use the system it should be serving all the users. It will enhance itself to serve all the incoming requests.

4.0 Software Reviews

4.1 Purpose

This section identifies the number and type of reviews and engineering peer reviews that will be performed. It describes the artifact types to be reviewed as well as the format of the reviews that will be conducted. These reviews have been scheduled on the WBS and accounted for in project planning.

4.2 Review Schedule

4.2.1 Artifact 1

Software Requirement Specification Document

Reviews:

- **Informal Review -:** with friend who give informal feedback on documented requirements
- **Formal Review -:** With group of professor, Teaching Assistant, and students

4.2.2 Artifact 2

Software Development Plan

Reviews:

- **Informal Review -:** with friend who give informal feedback on documented plan based on different metrics like function point etc.

4.2.3 Artifact 3

Schedule and Estimates

Reviews:

- **Gantt chart and Earned Value Analysis** for plan and estimating the costs related to process

4.2.4 Artifact 4

Code

Reviews:

Static code analysis for refactoring purpose.

4.2.5 Artifact 5

Test Case

Reviews:

To match it with testing so that it assists to mitigate the risk of error prone system.

4.2.6 Artifact 6

Algorithm

Reviews:

Formal review before final presentation to verify that it works with different test cases.

5.0 Test

5.1 Purpose

This section defines the types of testing and the scope of testing activities for this software development. Testing shall include both developmental testing as well as acceptance level testing. For each type, the scope of testing shall be defined as well as the responsible parties.

5.1.1 Unit Testing

5.1.1.1 Scope

Module Level testing which will used to ensure that each module independently doing its work correctly.

Major modules are:

- Read File
- Parse File
- Processing of File
- Generating Gantt Chart and excel file based on Processed data

5.1.1.2 Testing Description

Junit5 is used for testing each module of the program. Along with junit5 Jacoco library is used to reveal the code coverage for each module at line level.

5.1.1.3 Responsible Party

As it is an individual project so in this case developer is responsible for unit testing.

5.1.2 Integration Testing:

5.1.2.1 Scope

Interface testing so that when all the modules try to interact with each other they will produce expected result.

5.1.2.2 Testing Description

TestNG with the help of stubs and drivers will help to perform this testing.

5.1.2.3 Responsible Party

As it is an individual project so in this case developer is responsible for integration testing.

5.1.3 Acceptance Testing:

5.1.3.1 Scope

Final testing before the system deploy for production. It covers the all modules with expected inputs and output.

5.1.3.2 Testing Description

System will be tested by the user and confirms that if it produces results based on the specification.

5.1.3.3 Responsible Party

System Developer and end-user in our Case end user will be professor and Teaching Assistant and individual student as a developer.

6.0 Problem Reporting and Corrective Action

This section defines the problem reporting process and corrective action procedure to be used by Electric Vehicle Reservation System.

This is an individual project but still used many external libraries. For parsing excel file in java Apache POI and for Gantt chart JFreeChart.

Because of individual project there is no not any specific correction and reporting procedure.

7.0 Tools, Techniques and Methodologies

Software Quality personnel will require access to the following:

Tool Name	Version	Purpose
Microsoft Office tools (i.e., Word, Excel, and PowerPoint)	Office 2016	General Documentation, etc.
Jacoco		For Test Coverage
Junit5	5	For Unit Testing
Earned Value Analysis	-	For tracking schedule and cost
Git	-	For managing the Project Remote based
TestNG	-	For Integration Testing
Field Testing	-	For Acceptance Testing
Formal and Informal Review	-	For Requirement Validation
Function Point Metric	-	For Work break down structure

References

https://resources.sei.cmu.edu/asset_files/Presentation/2015_017_101_438658.pdf