CS691 – Computer Science, Spring 2020

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SYSTEM TEST PLAN

Pet-A-Dog

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# INTRODUCTION

This document is for the establishment of the System Test Plan that provides a common understanding among the “Pet-a-Dog” project stakeholders on the following aspects, including the scope, objectives, and approach to performing the system testing. Moreover, the document also involves a few more topics, which are features to be tested, entry/exit criteria, resource and responsibilities, and testing schedule.

# 1. TESTING SCOPE

The testing scope mainly consists of two aspects, which are the functional scope and technical scope.

In line with our expected functions of our system, the scope of system testing includes following functional aspects:

* Book a Sitter.
* Log/Sign into as subscribed user
* Enter Dog Details
* Enter Housing Conditions
* Tips and Tricks Page
* Give Reviews to sitter
* Confirmation Emails after booking a sitter
* The 3rd party payment methods
* Store data in database

The corresponding modules in the Pet-a-Dog system are: Home, Booking Module, Tips and Tricks, Sitter Monitoring, Payment Processing, Review & Database modules.

The technical scope includes the following components that are associated with the expected functions:

* Web browser
* Application server
* Database server

# 2. TESTING OBJECTIVES

This testing objective is to validate the implementation of the system in order to measure whether both functional and non-functional performance can match the designed requirements. The system test cases should include negative, i.e., challenging testing conditions in order to be effective in finding software defects. In this statement of objective for system testing, the target testing objectives will be clearly stated in order to distinguish them from those objectives that will not be tested.

A number of project documents will be involved and used in testing cases. Main documents include:

* Business Requirements Document (BRD)
* User Stories
* Requirements Composition Table (RCT)
* Requirements Traceability Matrix (RTM)
* Feature Short Descriptions Table (for modules)
* Entitlements Specification (ES) table
* Responsibility Assignment Matrix – RACI table
* Project Initiation Document (function descriptions)

## 2.1 Core Features to be Tested

This section lists all core features that will be tested. The presentation is organized by an order of modules below.

**Home Module**

* Guest User
  + To test whether the Guest User has the ability to login without credentials and able to access tips and tricks modules.
* Subscribed User
  + To test whether the Subscribed user has the ability to sign up and login to the website and able to access the services.
* Account Manager
  + To test whether the Account Manager has access to the home module.
* Advertisement sales management
  + To test whether the Advertisement sales management has access to Home Module.

**Booking Module**

* Subscribed User
  + To test whether the Subscribed User is able to search for a sitter by adding zip code.
  + To test whether the subscribed user is able to select the type of services from the list of services given.
  + To test whether the subscribed user is able to book a sitter from a list of sitters provided depending upon the zip code and choice of service.
* Advertisement sales Management
  + To test whether the Advertisement sales management has access to Booking Module.
* Account Manager
  + To test whether the Account Manager has access to the Booking module.
* Special service manager
  + To test whether the Special service Manager has access to the Booking module.
* Customer support manager
  + To test whether the Customer support manager has access to the Booking module.

**Tips and Tricks Module**

* Subscribed User and Guest User
  + To test whether the Subscribed user and Guest User is able to specify breed of the dog by selecting it from the list of dogs.
  + To test whether the Subscribed user and Guest User is able to specify height and weight of dog to get the useful tips and tricks information.
  + To test whether the Subscribed user and Guest User is able to specify the housing condition on tips and tricks section to get useful information.
* Advertisement sales Management
  + To test whether the Account manager has access to Booking Module.

**Sitter Monitoring Module**

* Subscribed User
  + To test whether the Subscribed user is able to access the sitters location after booking that sitter.
  + To test whether the Subscribed user is able to see the estimated time of arrival for the sitter.
* Advertisement Sales Management
  + To test whether Advertisement Sales management has access to this module to display ads.
* Customer Support Management
  + To test whether Customer Support Management has access to the sitter's location to help with customer issues.
  + To test whether Customer Support Management has access to the sitter's estimated time of arrival to help with customer issues.

**Payment Processing Module**

* Subscribed User
  + To test whether the Subscribed user is able to select payment options from Netbanking, credit/debit card, paypal.
* Accountant
  + To test whether Accountant has access to the payment processing module.
* Account Manager
  + To test whether Account Manager has access to the payment processing module.

**Review Module**

* Subscribed User

To test whether the Subscribed user is able to give reviews out of five to the sitter.

To test whether the Subscribed user is able to comment to the sitter based on the service delivered by sitter.

* Advertisement sales Management
  + To test whether the Account Manager has access to the review module.
* Customer support manager
  + To test whether the Customer Support manager has access to the review module.
* Guest Users
  + To test whether the Guest Users have access to the review module.

**Database Module**

Account manager

* + To test whether the user’s information is getting stored in the database.
  + To test whether the sitter’s information is getting stored in the database.
  + To test whether the transaction information is getting stored in the database.

Besides the core features requiring tests mentioned above, the function testing also will cover crosscutting concerns that are applicable to the context of the individual core features (refer to RCT).

## 2.2 Non-Functional Features to be Tested

The system test will cover following testing objectives according to the non-functional requirements:

* Usability
  + To test whether the application has a clear interface.
  + To test whether users are able to use the application without a high level of computer experience.
  + To test whether the application requires users to take less than 5 minutes to figure out a feature.
* Performance
  + To test whether the response time of the application is not exceeding 2 seconds depending on the user's connection condition.
  + To test whether the response is fast enough to avoid users’ response collisions.
  + To test whether the application is available for users 24 hours a day, 365 days per year.
  + To test whether the application can simultaneously support several users.
* Security
  + To test whether the system can encrypt all user information and communications.
  + To test whether the system implements different user groups’ entitlements.
  + To test whether the application can be protected from hacking.
* External Systems
  + To test whether the application can interface with social media websites, credit card payment services, and other online resources.

## 2.3 Features not to be Tested

There are a few features that will not be covered in the testing based on the requirements of the project. A non-test features list is given as follows:

* An international-oriented service will not be tested. This project has a specific target customer focus; therefore, international users will not be considered at the current testing stage.
* The Networking issues will not be tested.Current focus of this project is to develop a system that can successfully achieve designed functions.

# 3. TEST PROCESS DEFINITION

## 3.1 Test Process Phases

The test process phases of this system testing consists of five phases, which are test planning, design, preparation, execution, and reporting. Each phase has a few purposes/tasks/goals, which are given as follows:

* Test Planning
  + Define scope and objectives of testing
  + Define roles and responsibilities
  + Define testing approach
* Test Design
  + Determine test design logic
  + Design test case specifications
  + Determine requirements for test data
* Test Preparation
  + Setup a test environment
  + Provision test data
  + Install the software in a proper environment
* Test Execution
  + Execute all test cases
  + Find and report software defects
  + Evaluate the system stability
  + Validate all target features
* Test Reporting
  + Create a testing report for stakeholders
  + Clearly state the testing process
  + Summarize the test execution
  + Report defect metrics and execution status
  + Evaluate the test exit criteria
  + Signing off the system testing by providing the approval of the final report

## 3.2 Testing Tasks and Deliverables

The following table further provides details of the test process phase in terms of the statements given in Section 3.1.

|  |  |  |
| --- | --- | --- |
| **Process Phase** | **Tasks** | **Deliverables** |
| Test Planning | * Define scope and objectives of testing * Define roles and responsibilities * Define testing approach | System Test Plan documentRole and Responsibility Table |
| Test Design | * Determine test design logic * Design test case specifications * Determine requirements for test data | * Test Design Specification * Test-Case Specifications * Test Management System |
| Test Preparation | * Setup a test environment * Provision test data * Install the software in a proper environment | * Testing system establishment * Test availability of the data in an application environment * Implement Defect Tracking System |
| Test Execution | * Execute all test cases * Find and report software defects * Evaluate the system stability * Validate all target features | * Defect reports reported in the defect tracking system |
| Test Reporting | * Create a testing report for stakeholders * Clearly state the testing process * Summarize the test execution * Report defect metrics and execution status * Evaluate the test exit criteria * Signing off the system testing by providing the approval of the final report | * Test Summary Report * Defect metrics * Test execution status reports * Final test report |

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# 4. APPROACH TO SYSTEM TESTING

## 4.1 Approach to Functional Testing

The purpose of this section is to present the method of the functional testing for examining the developed system. Since this project rarely concerns the optimization issue, a black-box testing technique will be mainly utilized in examining whether functionality reaches the designed goal and whether the application follows business requirements (refer to Section 2.1). There are a few reasons for using a black-box testing approach. First, using a black-box testing can effectively examine the functionality of an application without the knowledge of the internal structure. This manner is close to real-world application scenarios as customers do not know internal workings. Next, a black-box testing approach ignores the internal mechanism and directly touches inputs and execution conditions. All testing objectives’ functionalities are observable based on this approach. Finally, a black-box testing is suitable for functional and user acceptance testing, which matches the tests of the business requirements.

A few black-box techniques that will be utilized in the testing include boundary-value analysis, cause-effect graphing, decision table testing, and state-transition testing.

## 4.2 Approach to Non-Functional Testing

Both black-box testing and white-box testing will be used for non-functional testing. A black-box testing will address three aspects of the non-functional testing, which are usability, performance, and legislative (refer to Section 2.2). The features and advantages of a black-box testing have been discussed in Section 4.1.

Moreover, a white-box testing also will be applied to a few non-functional testing operations, including security and space aspects (refer to Section 2.2). As an internal-oriented testing approach, a white-box testing emphasizes the mechanism and skills deployed in the system. There are a number of reasons for supporting this white-box testing strategy. First, a white-box testing considers the testing object from an internal perspective of the system, such that programming skills will be investigated. Thus, security issues and service efficiency aspects can be fully addressed during a white-box testing. The other reason is that a white-box approach is good for unit testing, so that some non-functional testing can be processed, such as security investigation.

Main white-box techniques that will be used in the testing include control flow testing, data flow testing, statement coverage, and decision coverage.

# 5. ENTRY/EXIT CRITERIA

This section addresses both entry and exit criteria for the system.

## 5.1 Entry Criteria

The purpose of the test entry criteria is to form an evaluation standard that will be used to begin test executions. An amount of conditions of the entry criteria include:

* Complete the development of the all tasks
* Accomplish the integration testing
* Approve the system test plan
* Establish the testing (QA) environment
* Make the testing environment accessible
* Finish and review test case specifications
* Distribute notes documents to team members

## 5.2 Exit Criteria

The purpose of the test exit criteria is to determine when and how the testing is complete. It is a criteria showing the system is ready for the application to users. Main conditions of the exit criteria include:

* Have executed all testing cases
* Zero defects of Critical and High-severity remain open
* Open defects of Medium and Low severity have known work-around
* Have completed a summary testing report
* Have approved a testing sign-off

# 6. SYSTEM TEST ENVIRONMENT

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# Test environment is a laptop with a virtual machine running the web server and database, and an internet browser (Chrome, Firefox, Internet Explorer and Safari) to access it.Test environment on different device sizes, different operating systems.

# 7. ROLES AND RESPONSIBILITIES

The project team has eight members, including Project Manager, Product Owner, Lead Business Analyst, Lead Developer, DBA, Two Lead QA Analysts, and Professor. Aligning with the project’s RACI Table, the following table provides descriptions of roles and responsibilities for each team member during the testing period.

|  |  |
| --- | --- |
| **Project Role** | **Role Responsibilities** |
| Project Manager | Assist the testing operation throughout the process of system testing; assist to govern the overall project timelines; review and approval of the System Test Plan, escalation of issues. |
| Lead QA Analyst | Responsible for designing a test plan, establishing a test repository, developing test specifications, executing testing and report defects, conducting defect review calls, and producing/delivering defect metrics. Also consulting the establishment and maintenance of the test environment. |
| Product Owner | Consulting test plans, test repository, and test specifications. Also keeping up-to-date on other work’s progress. |
| Lead Business Analyst | Work with Lead QA Analyst and be responsible for conducting defect review skills and producing/delivering defect metrics. Participate in other work if necessary. |
| Lead Developer | Responsible for establishing and maintaining the test environment and assisting Lead QA Analyst throughout the testing process. |
| DBA | Responsible for assisting Lead Developer and Lead QA Analyst to establish and maintain the test environment. Keep informed throughout the testing period. |
| Professor | Guide/advise the project team. |

# 8. TEST CYCLES AND SCHEDULE

The system testing consists of three test cycles in line with three modules. Details of the module cycles and the corresponding schedules are presented in the followings.

**Cycle 1. Home Module**

This cycle concentrates on testing the Home Module for Subscribed User, Guest Users, Advertisement Sales Management, Account manager.

**Cycle 2. Booking Module**

This cycle concentrates on testing the Booking Module for Subscribed User, Customer support manager, Advertisement Sales Management, Account manager, Special service manager.

**Cycle 3. Tips and tricks Module**

This cycle concentrates on testing the Tips and tricks Module for Subscribed Users and Guest Users, Advertisement sales management.

**Cycle 4: Monitoring Sitter Module**

This cycle concentrates on testing the Tips and tricks Module for Subscribed Users and Guest Users, Customer Support Manager, Advertisement sales management.

**Cycle 5: Payment Processing Module**

This cycle concentrates on testing the Tips and tricks Module for Subscribed Users, Account manager and accountant.

**Cycle 6: Review Module**

This cycle concentrates on testing the Tips and tricks Module for Subscribed Users, Guest user, advertisement sales management.

**Cycle 7: Database Module**

This cycle concentrates on testing the Tips and tricks Module for Account manager.

The timeline of the project schedule and all testers’ activities can refer to the project plan document.

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# 9. RISKS AND CONTINGENCIES

This section highlights a few potential risks and contingencies that may have happened during the system testing.

* A lack of testing resources can result in more time needed to complete test case specifications.
* Any changes on the scope or existing functional requirements objectives can cause a delay or extra work.
* A large number of defects require a longer time to fix the system.
* Collaboration of the team has an impact on the testing progress.