Software Quality Assurance (SQA) Plan
By PetPal

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Signature Page

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Contents

1. Purpose and Scope

1.1. Purpose

The purpose of this Software Quality Assurance (SQA) Plan is to establish the goals, processes, and responsibilities required to implement effective quality assurance functions for the PetPal project.

The 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 Quality Manager and Quality Engineer to monitor and assess software development processes and products to provide objective insight into the maturity and quality of the software. The systematic monitoring of products, processes, and services will be evaluated to ensure they meet requirements and comply with policies, standards, and procedures, as well as applicable Institute of Electrical and Electronic Engineers (IEEE) and ISO standards.

1.2. Scope

The purpose of SQA is to ensure that the software developed does not deviate from the original intended product. SQA is also concerned with identifying any errors, omissions, inconsistencies, and alternatives, enhancements or improvements that can be made at any stage of development.

PetPal is a web application designed to streamline pet adoption, pet sitting services, and pet-related events into one unified platform. Developed by the PetPal team, the software aims to address the fragmented nature of the current pet adoption process in Singapore and simplify pet care logistics for owners and sitters. The software items covered by the plan include modules for pet adoption listings, pet sitting services, and event hosting features. The intended use of the platform is to provide an accessible and reliable service for pet agencies, adopters, pet owners, and pet sitters, improving the overall user experience.

2. Reference Documents

- IEEE STD 730-2002, IEEE Standard for Software Quality Assurance Plans (http://standards.ieee.org/reading/ieee/std_public/description/se/730-2002_desc.html)
- ISO IEC 90003:2004 Software Standard (http://praxiom.com/iso-90003.htm)
- Project Plan
- System Requirement Specifications

3. Management

This section describes the management organisational structure, its roles and responsibilities, and the software quality tasks to be performed.

3.1. Management Organization

The implementation of the quality assurance system is the responsibility of the Quality Assurance Manager (QAM).

3.1.1. Project Management

The Project Manager will be responsible for approving:-

- The system requirement specification document
- The overall time scale for the project
- The choice of system development life cycle
- The choice of software development tools and techniques utilised
- Task allocation.

3.1.2. Assurance Management

The QAM provides Project Management with visibility into the processes being used by the software development teams and the quality of the products being built. The QAM maintains a level of independence from the project and the software developers.

In support of software quality assurance activities, the QAM has assigned and secured Software Quality personnel from the pool of available team members with relevant skills, including the Quality Engineer to coordinate and conduct the SQ activities for the project and report back results and issues.

3.2. Tasks

This section summarises the tasks (product and process assessments) to be performed during the development of software. These tasks are selected based on the developer's Project Plan and planned deliverables, and identified reviews.

3.2.1. Product Assessments

The following product assessments will be conducted by SQ personnel:

- User Authentication Component
- Pet Adoption Module
- Pet Sitting Service Module
- Pet Events Feature

3.2.2. Process Assessments

The following process assessments will be conducted by SQ personnel:

- Requirement management process
- Change management process
- Agile Development Process
- Testing and Debugging Process

3.3. Roles and Responsibilities

This section describes the roles and responsibilities for each assurance person assigned to the Project.

3.3.1. QAM

Responsibilities include, but are not limited to:

- Secure and manage SQ personnel resource levels
- Ensure that SQ personnel have office space and the appropriate tools to conduct SQ activities
- Provide general guidance and direction to the SQ personnel responsible for conducting software quality activities and assessments
- Assist SQ personnel in the resolution of any issues/concerns and/or risks identified as a result of software quality activities
- Escalate any issues/concerns/risks to project management

3.3.2. Software Quality Personnel

Responsibilities include, but are not limited to:

- Develop and maintain the project software quality assurance plan
- Generate and maintain a schedule of software quality assurance activities
- Conduct process and product assessments, as described within this plan
- Identify/report findings, observations, and risks from all software assurance related activities to the QAM

4. Documents

4.1. Purpose

This section identifies the minimum documentation governing the requirements, development, verification, validation, and maintenance of software that falls within the scope of this software quality plan. Each document below shall be assessed (reviewed) by SQ personnel.

4.2. Minimum Document Requirements

- System Requirement Specifications
- Use Case Diagrams and Descriptions
- Quality Management
- Risk Management
- Configuration Management Plan
- Design Report on Software Maintainability
- Change Management Plan
- Release Plan
- Test Plan
- Test Cases and Requirements Test Coverage Report
- Presentation slides

5. Standards, Practices, Conventions and Metrics

5.1. Purpose

This section highlights the standards, practices, quality requirements, and metrics to be applied to ensure a successful software quality program.

5.2. Software Quality Programme

These practices and conventions are tools used to ensure a consistent approach to software quality for all programs/projects.

The following qualities are deemed particularly important for the PetPal project, and metrics will be used to ensure these aspects are achieved:

- **Functionality**: The system must perform the intended tasks (pet adoption, pet sitting, event hosting) without error or failure. This includes seamless user interactions and efficient backend processes for algorithmic matching and searching.
- **Usability**: The platform must be intuitive and easy for users (pet agencies, adopters, owners, and sitters) to navigate, ensuring a smooth and enjoyable user experience.
- **Maintainability**: The system must be designed and documented in a way that makes it easy for future developers to add features, fix bugs, and update components without introducing errors.
- **Reliability**: The platform must be robust, ensuring high availability and uptime, especially during high-traffic periods, and correctly handling all interactions without crashing or data loss.

5.2.1. Standard Metrics

The following standard metrics are the minimum planned metrics that will be collected, reported, and maintained in the area of software quality assurance:

- Programme size in lines of code
- Cyclomatic complexity
- Fog index
- Number of person-days required to develop a component
- Number of error messages
- Length of user manual

6. Software Reviews

6.1. Purpose

This section identifies the number and type of system/subsystem reviews and engineering peer reviews that will be supported by the SQ Personnel. The project milestone chart, and the SQ Personnel resource levels determine the reviews that are supported.

6.2. Minimum Software Reviews

For each review, SQ will assess the review products to assure that review packages are being developed according to the specified criteria, the review

content is complete, accurate, and of sufficient detail, and Requests for Action are captured, reviewed, and tracked to closure. In addition, SQ will assess the processes used to conduct the reviews to determine if appropriate personnel are in attendance, correct information is presented, entry and exit criteria are met, and appropriate documents are identified for update.

The following software reviews will be assessed by SQ:

- Project Plan Review
- Requirements Analysis Review
- Software Design Review
- Test Plan Review
- Acceptance Review

7. Test

SQ personnel will assure that the test management processes and products are being implemented per Test Plan. This includes all types of testing of software system components as described in the test plan, specifically during integration testing (verification) and acceptance testing (validation). SQ personnel will monitor testing efforts to assure that test schedules are adhered to and maintained to reflect an accurate progression of the testing activities. SQ will assure that tests are conducted using approved test procedures and appropriate test tools, and that test anomalies are identified, documented, addressed, and tracked to closure. In addition, SQ will assure that assumptions, constraints, and test results are accurately recorded to substantiate the requirements verification/validation status. SQ personnel will review post-test execution related artefacts including test reports, test results, problem reports, updated requirements verification matrices, etc.

In addition to the activities mentioned, SQ personnel will also be responsible for monitoring the following specific types of testing:

- **Unit Testing Monitoring**: SQ will ensure that individual components or modules of the software are thoroughly tested for functionality, with any defects identified, documented, and addressed. SQ will review unit test results to ensure coverage of all key functionalities and edge cases.
- **Integration Testing**: SQ will monitor integration testing to verify that multiple components work together as expected. This includes ensuring proper communication between modules and identifying any integration issues, with a focus on verifying that all components interact seamlessly.
- **System Testing**: SQ will assess system testing to ensure that the entire software system operates as a cohesive unit. SQ personnel will review whether all system requirements are met, performance is within acceptable parameters, and that the system behaves as expected under various conditions.

8. Problem Reporting and Corrective Action

SQ personnel generate, track, and trend assessment findings and observations in a centralized Reporting and Corrective Action System hosted in a shared project management tool, Trello.

Assessment data and corrective action status will be communicated to the Quality Assurance Manager (QAM) and Project Manager through **weekly status reports**. These reports will highlight key issues, their current resolution status, and any pending corrective actions. Additionally, **monthly review meetings** will be held to provide a detailed overview of the problem resolution process, ensuring transparency and alignment with project timelines.

9. Tools, Techniques and Methodologies

SQ personnel will require access to the following:

9.1. Software Quality Tools

- Microsoft Office tools (i.e., Word, Excel, and PowerPoint)
- Google Drive
- Trello
- Figma
- GanttPRO

10. Media Control

SQ deliverables will be documented in one of the following Microsoft software applications: Word, Excel, or PowerPoint. Deliverables will be in soft copy, with the exception of completed checklists from process and product assessments. See Section 12 for additional details on the collection and retention of key records. Software Quality personnel will request space on the project's secured server for SQ records. This server is password protected and backed up nightly.

For documentation that requires extensive linking and interconnectivity, **MediaWiki** will be utilized to create and maintain structured knowledge bases and FAQs, which will serve as a living document for the team to reference. This ensures that key processes and product information are readily accessible and easily updated.

Telegram will be used for **real-time team communications**, allowing for instant messaging and quick updates on project status, issues, or questions. Important notifications regarding SQ deliverables, changes in assessment status, and corrective actions will also be shared via Telegram to ensure timely communication.

For **online meetings and collaboration**, **Zoom** will serve as the primary platform. Regular Zoom meetings will be held for status updates, assessments, and reviews, ensuring that both local and remote team members can participate and contribute to discussions. These meetings will be recorded when necessary to maintain an accurate record of key decisions and discussions.

In terms of **code management and version control**, **GitHub** will be used to track and manage changes to the software. GitHub provides a robust platform for code collaboration, with features like pull requests, issue tracking, and branch protection. SQ personnel will have access to GitHub repositories to monitor code quality and changes, ensuring that any issues related to software defects or deviations are addressed through the appropriate corrective action.

11. Supplier Control

[Not applicable for this project]

12. Record Collection, Maintenance, and Retention

SQ personnel will maintain records that document assessments performed on the project. Maintaining these records will provide objective evidence and traceability of assessments performed throughout the project's life cycle. There are two types of records that will be maintained: Hardcopy and Electronic. SQ personnel will maintain electronic or hard copies of all assessment reports and findings. SQ Project folders will contain hardcopies of the assessment work products such as completed checklists, supporting objective evidence, and notes.

The table below identifies the record types that will be collected, as well as the Record Custodian and Retention period

Record Title	Record Custodian	Record Retention
SQA Assessments	SQ Personnel	One Year
SQA Checklists	SQ Personnel	One Year
Deliverable Defects	SQ Personnel	One Year

13. Training

SQ personnel have fundamental knowledge in the following areas through prior experience, training, or certification in methodologies, processes, and standards:

- Audits and Reviews (Assessments)
- Risk Management
- Software Assurance
- Configuration Management
- Software Engineering
- ISO 9001, ISO 9000-3

· CMMI

· Verification and Validation

14. Risk Management

SQ personnel will assess the project's risk management process and participate in monthly risk management meetings and report any software risks to the QAM and the project manager.

15. SQA Plan Change Procedure and History

SQ personnel are responsible for the maintenance of this plan. It is expected that this plan will be updated throughout the life cycle to reflect any changes in support levels and SQ activities. Proposed changes shall be submitted to the Quality Assurance Manager (QAM), along with supportive material justifying the proposed change.