Software Quality Assurance (SQA) Plan
By Team Champion

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Signature Page

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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 **EMBER** 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 QAM and Software Quality (SQ) personnel 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 to identify any errors, omissions, inconsistencies, and alternatives, enhancements or improvements that can be made at any stage of development.

EMBER is an android mobile application which will help elderly of our society to interact and mingle with other elderly. The application consists of a matchmaking algorithm for users to find peers of similar interests, where when both parties give their consent, they would be able to chat with each other.

This plan will cover the **qualities** that we need to preserve for

(1) API requests and responses which will be used for transferring data between front end and back end

(2) Front-end Main User Interface for Android

(3) Back-end Database Control & Management which is for storing and transferring data

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
- Project Proposal

3. Management

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

3.1. Management Organisation

The implementation of 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
- The selection of project teams
- The training of project teams

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 SQ trainees to coordinate and conduct the SQ activities for the project and report back results and issues.

3.2. Tasks

This section summarizes 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:

- Log in Page
- Registration Page
- Home Page
- Profile Page for User
- Profile Page for another User
- Chat Page
- Matched for you Page
- Grid View of recommended people in Home Page
- Grid View of matched people in Matched For you Page

- Matching Algorithm
- API for log in
- API for registration
- API for Recommended People
- API for Matched People
- API for Chat
- API for Profile

3.2.2. Process Assessments

The following process assessments will be conducted by SQ personnel:

- Requirement Management Process (Elicitation, Analysis, Specification, Validation)
- System Requirement Management Process (Software, Hardware, Platform)
- System Architecture & Designing Process
- Coding Process
- Quality Review
- Testing Process
- Release 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

- Project Proposal
- Project Requirement Specification
- Risk Management
- Configuration Management
- Change Management
- Release Plan
- Test Plan

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.

We decided that **efficiency**, **usability**, **portability** and **reliability** are the quality attributes that our application must have. The following are the **reasons** why we chose these attributes.

Efficiency

Since our main target is elderly, their phone might not be very powerful. So, it is very important for our application to use system resources in a very efficient manner. We need to make sure that our application runs with minimal resource requirement.

Usability

Elderly are not able to adapt the technology as fast as youngsters can do. So, we must make sure that our application is very easy and simple to use. We must design our application interface in a way that elderly feel comfortable when they are using our application.

Portability

Technology is improving days and days. In the future, new SQL database system which use less resources and give more efficient performance can come out. Therefore, our application's backend must be able to switch to any SQL database system.

Reliability

The matching algorithm must be able to give more than an 80 percent precise match for the elderly. So that, they can entirely rely on our application to extend their circle. This is also the one of main intensions of our applications.

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:

- Time taken for API request & response between front-end and back-end cannot be more than 3 second. (Efficiency)
- Message delivering time between two chatting parties must be less than 2 second. (Efficiency)
- Application must be able to operate using not more than 24 Megabyte RAM only. (Efficiency)
- Font size must be 16 pixels for Name, 14 pixels for other texts and buttons. (Usability)
- The user must be able to log in with 3 steps. (Usability)
- The user must be able to view their profile with 1 step. (Usability)
- The user must be able to view other profile with 1 step. (Usability)
- The user must be able to match other people with 2 steps. (Usability)
- Profile Image size must be 300x250 dp. (Usability)
- All system features must be Android 5.0 standard. (Usability)
- Resolution of the image must be 72 DPI. (Usability)
- The front-end must be able to interact with all types of SQL Database (For example, mySQL, SQLite, phpMyadmin) (Portability)
- The system must define 10 points end for matched interest, matched language, matched location and matched gender. (Reliability)
- The system must calculate the average score by taking the total score of matched interests, location, language and gender and divided by 10. (Reliability)

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 artifacts including test reports, test results, problem reports, updated requirements verification matrices, etc.

8. Problem Reporting and Corrective Action

SQ personnel generate, track, and trend assessment findings and observations in a Google Document for Reporting & Corrective Action.

QA manager and project manager will review the assessment weekly in normal event. If there is a critical situation, SQ personal need to immediately report to the QA manager.

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)

- Android Phone (i.e., Samsung, HTC, Oppo, One Plus)
- MySQL (Database Management Tool)

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. Software Quality personnel will request space on the project's secured server for SQ records. This server is password protected and backed up nightly.

All the documents will be placed in Google drive Team Folder which will be shared by all team members.

11. 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

12. 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

13. Risk Management

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

14. 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.