CMMI Level 2 Definition

GuessWho™

Face-Name Matching Game for Dementia Patients

Delivered by

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1 Revision History

Version #	Date	Author(s)	Comments
1.0	06/11/2018	Vidur Sharma	Preliminary Version

2 Table of Contents

2 List of tables

3 Introduction

This document describes the management model for GuessWho™, a Web application software by the Bookies Team. This document is prepared with reference to the Capability Maturity Model Integration (CMMI) Level 2 requirements. It covers 4 process areas namely, requirement analysis, quality assurance, project planning and configuration management.

4 Requirement Analysis

4.1 Process Goal

System Requirement Specification (SRS) is a document that details the analysis and priorities of, and the agreement on the customer's requirements for the software. This agreement with the customer is the basis for planning and managing the software project.

4.2 Commitment to Perform

Establish and maintain an organizational policy for planning and performing the requirement analysis process

- All requirements are documented in SRS such as use case model and use case descriptions
- All requirements will be reviewed by Lead Developer and approved by Project Manager
- All the requirements will be discussed with both QA Manager & Engineer and development team to ensure the feasibility of the plan

4.3 Ability to Perform

Establish and maintain the plan for performing SRM

- All functional and non-functional requirements will be discussed by both QA Manager & Engineer and development team to assess the feasibility
- Every requirement will be analyzed and allocated with hardware, software and other system components
- The stakeholders for the requirements will be determined by the Project Manager

› The constraints and preconditions for the requirements will be documented in the SRS

4.4 Activities Performed

Identify and involve the relevant stakeholders of the SRM as planned

› All functional requirements are documented in the use case descriptions in SRS

› Non-functional requirements are identified and discussed by the development team and documented in the SRS

Monitor and control the SRM against the plan for performing the process and take appropriate corrective action

› Completed tasks are reviewed and tested to determine whether they are consistent with the requirements

› Changes to the allocated requirements are reviewed and documented in the change log

4.5 Measurement and Analysis

Measurements are made and used to determine the status for managing the software allocated requirements

› Changes to the requirements

› Status of each of the requirements

4.6 Verifying Implementation

Review the activities, status, and results of the SRS with management and resolve issues

› All the changes made for the requirements are required to the reviewed by Lead Developer and approved by the Project Manager

› All the changes are documented in the change log

› The requirement review is led by QA Manager & Engineer

› QA Manager & Engineer reviews and audits the work products for the software requirements

5 Quality Assurance

5.1 Process Goal

Quality Plan is a document that provides management with appropriate visibility into the process being used by the software project, and of the products being built. The visibility achieved by reviewing and auditing the software products and activities helps to verify that they comply with the applicable standards and procedures.

5.2 Commitment to Perform

Establish and maintain an organizational policy for planning and performing the process and product quality assurance process

- QA Manager & Engineer serve as independent evaluators to evaluate work products and processes
- Project Manager and development team provide the necessary documents and work products for assessment
- Project Manager periodically reviews the QA activities and results

5.3 Ability to Perform

Establish and maintain the plan for performing the process and product quality assurance process

- Establish and maintain records of the QA activities
- QA Manager & Engineer is responsible for coordinating and implementing QA processes for the GuessWho™ application

Provide adequate resources for performing the planned process, developing the work products and providing the services for the process and product quality assurance process

- Tools to support the QA activities are made available to the QA Manager & Engineer. They include workstations, database tools, auditing tools and prototype of the software

- SRS that contains the functional, non-functional, and interface requirements are ready for reference by the QA Manager & Engineer
- Review documents are prepared according to the needs of the SDLC phase

Assign responsibility and authority for performing the process, developing the work products, and providing the services of the process and product quality assurance process

- Communicate quality issues and ensure resolution of non-compliance issues with the team
- Establish and maintain records of QA activities according to the review form

Training for people performing or supporting the process and product quality assurance process as needed

- Training includes software engineering skills and practices, QA standards or procedures and QA tools

5.4 Activities Performed

designated work products of the process and product quality assurance process under appropriate levels of configuration management

- Quality Plan is developed in the early stages of SDLC
- Quality Plan is reviewed by the Project Manager and all stakeholders

Identify and involve the relevant stakeholders of the process and product quality assurance process as planned

- QA Manager & Engineer's activities are performed in accordance with the Quality Plan

Monitor and control the process and product quality assurance process against the plan for performing the process and take appropriate corrective action

- Deviations identified in the software activities and software work products are documented and handled according to a documented procedure

5.5 Measurement and Analysis

Measurements are made and used to determine the cost and schedule status of the QA activities

- Completions of milestones for the QA activities according to the Quality Plan
- Work completed, effort spent, cost involved in the project according to the Quality Plan
- Number of products audits and reviews according to the Quality Plan
- Implementation status according to the Quality Plan

5.6 Verifying Implementation

Review the activities, status, and results of the process and product quality assurance process with management and resolve issues

- Periodic review with the Project Manager to ensure all the plans are executed accordingly

6 Project Planning

6.1 Process Goal

Project Plan is a document that establishes reasonable plans for performing software engineering and for managing the software project. The reasonable plans are based on developing realistic estimates for the project and establishing necessary commitments to perform the project. It begins with a statement of project and constraints and goals that define and bound the project.

6.2 Commitment to Perform

Establish and maintain an organizational policy for planning and performing the project planning process

- Project Manager is in charge of the project planning phase
- All the changes in the project are required to be approved by the Project Manager, following which, the Project Manager will communicate the changes with the team and other stakeholders

› Project Plan is to ensure that the software requirements can be completed within the stipulated time-frame

6.3 Ability to Perform

Establish and maintain the plan for performing the project planning process

› The Project Plan includes scope of work, identification of stakeholders, assigned responsibilities, cost and schedules constraints and goals, dependencies between the tasks, and time and costs

Provide adequate resources for performing the planned process, developing the work products and providing the services of the process

› Tools to support project planning are available to the *Error404* team, such as MS Project and Excel

Assign responsibility and authority for performing the process, developing the work products, and providing the services of the project planning process

› All of the software work products planning is assigned by Project Manager

6.4 Activities Performed

Place designated work products of the project planning process under appropriate levels of configuration management

› Software project planning is initiated in the early stages of the project

› Cost and effort needed will be determined in each phase of SDLC

› The version number of the SCIs will show the progress of the work products

Identify and involve the relevant stakeholders of the project planning as planned

› Different tasks will be allocated with different resources, cost and time durations

› Project Manager will discuss with all the stakeholders to assess the feasibility of the Project Plan

› Project Manager will identify the task dependencies based on the resources available

Monitor and control the project planning process against the plan for performing the process and take appropriate corrective action

- All stakeholders are required to communicate all the constraints faced to the Project Manager
- Project Manager must be notified of all delays or changes in the tasks
- The team will review the Project Plan along with the Project Manager periodically to make sure the project is on track by using the product checklist, best practice checklist, modelling checklist, design checklist, code checklist and system testing checklist provided in the Project Plan

6.5 Measurement and Analysis

Measurements are made and used to determine the status for managing the software subcontract

- The milestones of the software project planning activities as planned can be used by the Project Manager as one of the measurements
- The cost and time taken for the milestone to complete
- The effort used in completing the milestone
- Changes made in the project
- Adjusted functions points (FP) and estimated lines of code (LOC) will be estimated by the Project Manager

6.6 Verifying Implementation

Review the activities, status, and results of the project planning process with management and resolve issues

- Project Plan is reviewed by Project Manager, QA Manager & Engineer and Lead Developer to determine the feasibility
- Periodic review between Project Manager and the Bookies team will be done to achieve common understanding on the work products status and to keep track of the progress

7 Configuration Management

7.1 Process Goal

Configuration Management Plan is a document that establishes and maintains the integrity of the products for the GuessWho™ application throughout its software life cycle. It will facilitate in identifying the configuration of the software at discrete points in time, systematically controlling changes to the configuration, and maintaining the integrity and traceability of the configuration throughout the lifecycle of the software.

7.2 Commitment to Perform

Establish and maintain an organizational policy for planning and performing the configuration management process

- Project Manager has to approve all major releases of, and major changes on the software configuration items (SCIs)
- Lead Developer will be responsible for updating the Software Requirements Specification (SRS) should there be any changes, to ensure consistency
- QA Manager & Engineer is in charge of the QA documents and Lead Developer is in charge of the source codes, libraries, code documentation and design diagrams

7.3 Ability to Perform

Establish and maintain plan for performing the configuration management process

Table 1: *Configuration Plan and Responsibilities*

Activities	**Responsible Party**
Review project plan to come out with QA	QA Manager & Engineer
Review project plan to come out with SCM	QA Manager & Engineer
Review SRS and update the changes made by the team	Lead Developer
Review SDD and update the changes made by the team	Lead Developer

Review codes and make sure all changes are updated in the configuration management tool	Release Engineer
Review source codes to make sure the unit testing is in the correct version with the code	QA Manager & Engineer
Review Unit Testing to make sure all the changes in the version are recorded in the system	QA Manager & Engineer
Review Integrate Testing by using software specification documentation to make sure all the changes of version are up to date	QA Manager & Engineer
Review System Testing by using SDD to make sure all the changes of version are up to date	QA Manager & Engineer
Review UAT by using SRS to make sure all the changes are up to date	QA Manager & Engineer
Review all SCRs to make sure all the versions are recorded in the system	Release Engineer

Provide adequate resources for performing the planned process, developing the work products and providing the services for the configuration management process

- Different systems have been set up so that the planned process can be executed accordingly:
  - Git Repositories
  - A Wiki site
- Training for people performing or supporting the configuration management process as needed

7.4 Activities Performed

Table 2: Activities and Responsibilities

Task	**Responsible Party**
Setting up Project	
Identify SCIs	QA Manager & Engineer

Install bug repository tool and database	QA Manager & Engineer
Set up software configuration repository tool	Project Manager
Set up repository for archiving documents for the project	Release Engineer
Project Development Lifecycle	
Export components for modification, test and delivery	QA Manager & Engineer
Create versions and archive versions	Release Engineer
Verify versions to be delivered and authorize deliveries	Project Manager
Configuration audit	QA Manager & Engineer
Monitor configuration records	QA Manager & Engineer
Management	
Manage versions and archives for software configuration	Release Engineer
Manage versions and archives for documents	Release Engineer
Manage quality report	QA Manager & Engineer

Identify and involve the relevant stakeholders of the configuration management process as planned

Table 3: *Decision Process and Responsibilities*

Activity	**Responsible Party**
At the end of an activity of the project	
Do a configuration freeze	Release Engineer
Present a configuration state of the components impacted by the activity	Release Engineer

Present a documentation state of the components impacted by the activity	Release Engineer
During a configuration management process audit	
Manage the configuration management process audit	Project Manager
Present the records of the configuration management process	Release Engineer
Present the quality records of the configuration management process	QA Manager & Engineer
Present the records of the documentation management process	Release Engineer

Monitor and control the configuration management process against the plan for performing the process and take appropriate corrective action

- Control changes by separating working set of work products from released set of work products. Track changes using built-in functionalities of SVN and Team Wiki
- Changes should be made whenever a new requirement is fulfilled, a requirement is changed, or a defect is found in a previously established work product
- Integrity of SCIs is maintained by configuration management audit where verification of SCIs is complete, consistent, and accurate

7.5 Measurement and Analysis

Measurements are made and used to determine the status of the activities for managing the system configuration

- Status of each of the allocated requirements is recorded and used as a measurement scheme
- The identification of the source code is established in the format *"<code_function>_<version_number>.<file_format>"* and the identification of the

documents is established in the format *"<document name>_<version number>.<revision index> – Bookies"*

- The documentation of the change activities should clearly reflect the progress of the project

7.6 Verifying Implementation

Review the activities, status, and results of the configuration management process with management and resolve issues

- All the intended changes to be made by the development team will be documented in Software Change Request (SCR) Form provided in the Configuration Management Plan document, which will be submitted to the members such as Project Manager, Release Engineer and QA Manager & Engineer who share responsibilities for configuration management for approval
- Any changes to the system requirements must be approved by the Project Manager before release
- Any changes made must be clearly reflected on the SCI's name and updated to the change log
- The QA Manager & Engineer must periodically review the activities and work documentations to ensure that system requirements are consistently met
- Versions, updates and changes of all SCIs must be properly documented in change log