Software Engineering Group Projects

House of Games Quiz

Product Backlog

Author: C.W. Loftus

Config Ref: SE.QA.RS-CS22120

Date: 13th December 2023

Version: 1.0

Status: Release

Department of Computer Science

Aberystwyth University

Aberystwyth

Ceredigion

SY23 3DB

Copyright © Aberystwyth University 2023

CONTENTS

1. INTRODUCTION 3

1.1 Purpose of this Document 3

1.2 Scope 3

1.3 Objectives 3

2. GENERAL DESCRIPTION 4

2.1 Product Goal 4

2.2 User Characteristics 4

3. PRODUCT BACKLOG 5

3.1 User stories 5

3.2 Documentation stories 9

3.3 External Interface Requirements 9

3.4 Performance Requirements 10

3.5 Design Constraints 10

3.6 Other Requirements 10

# INTRODUCTION

## Purpose of this Document

This document presents the Scrum Product Backlog for the Software Engineering Group Project 2023/24. It should be read in the context of the CS22120/CC22120 Group Project, taking into account the details of the group project assignment and the group project Quality Assurance (QA) Plan [1].

## Scope

This Scrum Product Backlog lists the Product Owner stories needed for computer programs that implement a four-player and quiz host implementation of Richard Osman’s House of Games quiz show [2]. These stories also include the attributes that are expected from the finished product. It also includes stories for the process of constructing the system.

## Objectives

The objectives of this document are:

• To describe the background to the group project application for 2023/24 (House of Games Quiz).

• To provide details of the criteria that the group project product must meet.

• To describe the types of interaction with the system which must be supported.

# GENERAL DESCRIPTION

## Product Goal

A successful product will provide an online, but reduced implementation of Richard Osman’s House of Game quiz [2].

The quiz will consist of four players and a quiz host. Each player will use their own PC or laptop, as will the quiz host. Each quiz consists of five game rounds. The first four are randomly generated and with the final round always consisting of the Answer Smash game. The quiz host decides when the first round starts, and then starts each subsequent round. The first four rounds will randomly consist of:

* Buzzer round, where contestants use their buzzer to indicate if they know the answer to a question. They then type in the answer and are either automatically deemed correct or incorrect. A player receives one point for a correct answer.
* Pairs round, where a randonly chosen contestant decides who they wish to pair with and the jointly answer a question, and if correct both receive a point.
* A “tablet” round, where all the contestants enter an answer to a question, and the contestant closest to the answer gains the point.

The quiz host will see a score sheet of the scores for each round as well as the overall scores at the end of the quiz. All the scoring from the rounds and the final score will be saved so that they can be displayed at a later time.

## User Characteristics

The quiz players, quiz host and quiz maintainer users are not necessarily computer experts. It is acceptable to assume that they will have some knowledge of standard PCs running Microsoft Windows. In particular, they will be able to use the mouse and keyboard to operate standard Windows-style dialogs.

# PRODUCT BACKLOG

## User stories

**US1 Quiz host initiates quiz**

As a quiz host, I want want to initiate the quiz so that each of the four participants can enter their names. A quiz can only be initiated if it contains at least one Buzzer round game, one Pairs round game and one Tablet round game and one Answer Smash game and there are four participants. This is all needed so that a successful quiz can be played.

**Priority:** Must have

**Conditions of satisfaction:**

1. There must be a way to initiate the quiz in the quiz host program UI.
2. That initiation is only allowed if there are exactly four participant programs, each successfully connecting to the quiz host program via sockets (see DC2).
3. The participants must enter their names, of any length.
4. That initiation is only allowed if the system has have at least one Buzzer, Pairs, Tablet and Answer Smash Game.
5. Not having 2 to 4 prevents initiation.
6. After initiation the quiz host program UI is in a state to allow US2.

**US2 Quiz host starts quiz**

As a quiz host, I want want to start the quiz so that first round game (US6 – US8) is randomly selected and presented to the participants. See US4.

**Priority:** Must have

**Conditions of satisfaction:**

1. This must only be possible after US1 initiation.
2. There must be a way to start the quiz in the quiz host UI.
3. That a first round game is randomly selected and presented to the four participants and the quiz host.
4. After starting, the quiz host UI is in a state to allow US3 or US5.

**US3 Quiz host ends quiz**

As a quiz host, I want want to end the quiz at any time so that the overall scores for each participant are displayed on the quiz host’s PC and on each of the participant PCs.

**Priority:** Must have

**Conditions of satisfaction:**

1. There must be a way to end the quiz in the quiz host UI and at any time during the quiz.
2. The scores at this point are displayed on the quiz host PC and on each participant’s screens.
3. The quiz host UI is in a state ready to start a new quiz (US1).

**US4 Quiz host moves to next round game for rounds 2 to 5**

As a quiz host, I want want to move to the next round game, where the previous round has ended and where it is rounds 2 to 4, so that the round game (US6 – US8) is randomly selected and presented to the participants, and if round 5, then the Answer Smash game (see US13) is presented to the participants.

**Priority:** Must have

**Conditions of satisfaction:**

1. Where the current round is rounds 2 to 4, then the quiz host UI provides a way to start the round, which is a randomly selected round game.
2. When the current round is 5, then the quiz host UI provides a way to start the answer smash game.
3. A started round is correctly displayed to the participants, and the quiz host. The nature of the display depends on the type of game.

**US5 Quiz host ends a round**

As a quiz host, I want to be able to end the current round when the current game has ended, so that the current score is displayed on my PC and on the participants’ PCs and so that I can either move to the next round (UC4) or end the quiz (US3).

**Priority:** Must have

**Conditions of satisfaction:**

1. There must be a way to end a round on the quiz host UI after the current game has completed.
2. When ended the current participant scores are displayed on the quiz host UI and all the participant UIs.
3. When ended the quiz host UI must be in a state for UC4 (rounds 1 – 4) or for UC3.

**US6 Buzzer round**

As a quiz host, I want one of the round types to be a buzzer type, where a question is displayed and where the four participants can, **in realtime** (see PR1), buzz in if they know the answer. The fastest buzzing participant types in the answer and receives a point if correct and no point if incorrect. If incorrect each of the remaining participants can buzz in to repeat the process until either no further participants remain or a participant gets the correct answer (and receives a point) or I end the game (at any time) and the answer is displayed to all paticipants.

**Priority:** Must have

**Conditions of satisfaction:**

1. The type of round and question is displayed on all screens briefly before and during the round.
2. A question is displayed on the quiz host UI and the 4 participant UIs.
3. The participants’ UIs have a large buzzer button.
4. The first participant to click the buzzer is presented with a way to type the answer.
5. The anwering participant can type an answer and submit it. This is displayed to all participants and the quiz host.
6. The program decides if correct or incorrect, but can be overridden by the quiz host.
7. The quiz host can mark as incorrect if the participant is deemed to be taking too long.
8. If incorrect the process 1 – 6 is repeated for all remaining participants until either someone gets the answer right or no participants remain or the quiz host decides to move on.
9. A participant who gets the answer right is awarded 1 point.
10. At the end of the game the answer is displayed to the quiz host and all participants.

**US7 Pairs round**

As a quiz host, I want one of the round types to be a pairs type, so that a participant is randomly selected and asked who they wish to pair with with the other two contestants being paired automatically. Each pair is presented the same question and they independently type in a hidden answer. The nature of the game determines the style of participant interaction. I decide when all particpants have entered their answers and then request the result of the game to be displayed. The winning pair each receive one point each, with the losing pair receiving no points. The actual answer is then displayed to all participants.

**Priority:** Must have

**Conditions of satisfaction:**

1. The type of round and question is displayed on all screens briefly before and during the round.
2. The system randomly selects a participant.
3. The participant’s UI asks them to select one of the other three participants.
4. The remaining two participants are paired automatically.
5. The participant UIs and the quiz host UI makes is clear who is paired with whom.
6. All the participants are shown the same question. The quiz host UI also displays the question.
7. The participants’ UIs provide a way for the participnats to enter their answer, without the other participants being aware.
8. The quiz host UI can see the answers entered and so knows when all have entered something.
9. The wining pair (could be closest to the answer) receive one point each.
10. The losing pair receive no points.
11. The actual answer is displayed on all UIs.

**US8 Tablet round**

As a quiz host, I want one of the round types to be a “tablet” type, so that the particiants are shown a question and they each enter their hidden answer. I decide when all the particpants have entered their answers and then request the result of the game to be displayed. The nature of the game determines the style of participant interaction and the marking scheme can be overridden. The participant(s) with an answer that is closest wins the game and is awarded a point. The other participants do not receive a point. The actual answer is then displayed to all participants.

**Priority:** Must have

**Conditions of satisfaction:**

1. The type of round and question is displayed on all screens briefly before and during the round.
2. All the participants are shown the same question. The quiz host UI also displays the question.
3. All participants can type an answer and submit it.
4. All four answers are displayed on the quiz host’s UI.
5. The quiz host can time out the interaction and move to step 6 if the one or more participants are taking too long to submit an answer.
6. Only the participant’s answer is shown on their UI.
7. The program decides which answer(s) is closest, but can be overridden by the quiz host, and the winning participant(s) receive a point.
8. Other participans do not receive a point.
9. All participant answers are shown to all participants.
10. The actual answer is displayed on all UIs.

**US9 Save quiz state automatically**

As a quiz host, I want the state of the quiz to be saved automatically, so that if the quiz fails (for whatever reason) the quiz can either be resumed from where it failed (US10) or a fresh quiz restarted (US1).

**Priority:** Costly to lose

**Conditions of satisfaction:**

1. Every detail of the quiz at any point is recorded automatically on persistent storage, in sufficient detail to enable it to be recreated (US10).
2. There is no history of restarts; only the current game is recorded overwriting any previous game.

**US10 Restart a failed quiz**

As a quiz host, I want to be able to restart a failed quiz so that a previous failed quiz can be continued rather than having to start again.

**Priority:** Costly to lose

**Conditions of satisfaction:**

1. On program restart the quiz host UI offers the opportunity to retstart from a failed quiz (if one exists). If it doesn’t exist or the quiz host does not select restart, then US1 is enacted.
2. No filename is required.
3. The restarted quiz appears in the same state it was in at the point of failure, and across all participant UIs.

**US11 Save quiz statistics**

As a quiz host, I want to be able to name and save the currently ended quiz’s statistics to a database, including all the participant names, the date and time of the quiz, their scores for specific round games and their overall scores, so that they may be displayed in the future (US12).

**Priority:** Nice to have

**Conditions of satisfaction:**

1. At the end of the quiz, the quiz host UI offers the opportunity to save the quiz statistics.
2. The quiz host decides on the name of the quiz and where duplicate names are not allowed.
3. The names of the participants, date and time of the quiz, the participant scores for all rounds and the overall scores for all participants are saved.

**US12 Display past game statistics**

As a quiz host, I want to be able to display the statistics of all previous quizzes within a given date and time period so that they are displayed in descending date order.

**Priority:** Nice to have

**Conditions of satisfaction:**

1. At any point on program startup, the quiz host UI provides a way to request the display all previous quizzes for a specific date and time period.
2. If there are quizzes within the given date and time period then they are displayed in date and time descending order; i.e. the most recent I first in the list.
3. The original name of each quiz is displayed along with quiz details (US11).

**US13 Answer Smash game play**

As a quiz host, I wish this game to present a four-minute set of randonly generated categories and their questions so that points can be awarded and removed in fast succession, adding to the exceitment of the quiz. Each category has two questions presented. Each question consists of a general knowledge textual question and an associated picture, so that the answer to the first and the description of the picture forms a single integrated phrase. For example, the question might be:

“What is the name of a famous linen cloth that bears the image of a man, claimed to be Jesus?” and a picture of Alan Turing. The answer smash would be “Alan Turin Shroud”.

The first participant to buzz in types in the answer. If correct they receive a point. If incorrect a point is deducted. Answers are not case sensitive. If the answer is not quite a match, then I can decide if the answer is close enough. For example, either Turin or Turing would be acceptable in the above answer. I am always in control of when one question ends and the next begins, but the system is in control of the overall time allowed and does not allow a new question to be displayed if the time period has elapsed.

**Priority:** Must have

**Conditions of satisfaction:**

1. The game lasts approximately 4 minutes. A new question can be asked if the 4 minute deadline has not been reached. A new question cannot be asked if the 4 minute deadline has been reasched.
2. The question categories are displayed randomly.
3. Each question is presented as a textual question and a related picture and across all participant and quiz host UIs.
4. The participants UIs present a buzzer button.
5. The first participant to buzz is presented with an answer textual field into which they enter their answer.
6. Their answer is displayed through all participants’ UIs and the quiz host UI.
7. The system decides if their answer matches.
8. The quiz host can override the system and award a match if they decide the answer is close enough.
9. A correct match results in a point being awarded to the participant.
10. An incorrect answer results in a point being deducted from the participant.
11. The quiz host is in control of moving to the next question at all times, including if the participants are taking too long to buzz in.
12. The answer is displayed to the quiz host at the start of each game.
13. The answer is shown to all participants briefly when the quiz host moves to the next question.

**US14 Games House Of**

As a quiz host, I wish to have a buzzer round game (US6) that presents a question, the answer to which has to be in reverse alphabetical order. This is so that we can demonstrate the quickness and general knoweldge of participants. See [2] for the full definition and an example.

**Priority:** Must have

**Conditions of satisfaction:**

1. The answer from the fastest participant is checked to see if each word is in the correct reverse alphabetical order of the actual answer.

**US15 Distinctly Average**

As a quiz host, I wish to have a pairs round game (US7) where the pairs are presented with a question that requires a numeric answer, so that contestants can demonstrate their numeracy skills and ability to pick a good partner. Each of the pairs enters a hidden value and the average is found. See [2] for the full definition and an example.

**Priority:** Must have

**Conditions of satisfaction:**

1. All participants are only allowed to enter a numeric answer.
2. The system correctly calculates the average answer from each pair.

**US16 I’m terrible At Dating**

As a quiz host, I wish to have a tablet round game (US8) that presents a question that requires a year as an answer. If one or more participants get the exact year, then they receive two points each, otherwise the closest wins a point. See [2] for the full definition and an example.

**Priority:** Must have

**Conditions of satisfaction:**

1. All participants are only allowed to enter a valid Gregorian year as an answer, including A.D. and B.C.
2. If one or more participants get the exact date they receive 2 points each otherwise the participant(s) with the closest value receive s 1 point. It is possible that several participants are equally close.

**US17 Create quiz game**

As a quiz maintainer, I wish to be able to create a new quiz game, that is either a Games House Of game (US14), Distinctly Average game (US15), I’m Terrible At Dating game (US16), or Answer Smash game (US13), so that I can populate the quiz with games of these types and add their questions and answers as data. Note that the quiz can only contain a single Answer Smash game which when created must have a pool of at least 10 questions.

**Priority:** Must have

**Conditions of satisfaction:**

1. The quiz maintainer UI provides the ability to create a quiz, but only if no quiz is currently in progress.
2. The created quiz games are made persistent.
3. The quiz maintainer can create a Games House Of game consisting of:
   1. A question.
   2. An answer (in correct alphabetical order).
4. The quiz maintainer can create a Distinctly Avereage game consisting of:
   1. A question.
   2. A numeric answer.
5. The quiz maintainer can create a I’m Terrible At Dating game consisting of:
   1. A question.
   2. An answer that is a valid Gregorian date and accepts A.D. and B.C (or similar).
6. The quiz maintainer can create an Answer Smash game consisting of at least 10 questions where each question consists of:
   1. A textual question.
   2. An associated image.
   3. An answer.

**US18 Edit quiz game**

As a quiz maintainer, I wish to be able to edit and existing quiz game, so that I can fix any errors in the question(s) or the answer(s).

**Priority:** Must have

**Conditions of satisfaction:**

1. The quiz maintainer UI is able to display a list of all the quiz games and the ability to select one for editing, but only if no quiz is currently in progress.
2. A game selected for editing allows the quiz maintainer to change details that do not conflict with those in US17.
3. All changes are made persistent.

**US19 Delete quiz game**

As a quiz maintainer, I wish to be able to delete an existing quiz game, so that I can remove a quiz game that does not seem to be working.

**Priority:** Must have

**Conditions of satisfaction:**

1. The quiz maintainer UI is able to display a list of all the quiz games and the ability to select one for deleting, but only if no quiz is currently in progress.
2. Any game can be deleted, possibly leaving no games in the quiz.
3. All changes are made persistent.

## Documentation stories

**DS1 UI prototype**

As a product owner, I wish to have a UI prototype produced that conforms to SE.QA.04 [3], so that I can see the design of the user interface at an early stage in order to provide feedback to developers and also so that the developers can reason about the functionality of the system and use it as a basis to implement that system.

**Priority:** Must have

**DS2 Architectural design**

As a product owner, I wish to have an architectural design produced that conforms to SE,QA.05 [4], so that I can see the architectural design of the software at an early stage in order to provide feedback to developers and also so that the developers can reason about the functionality of the system and use it as a basis to implement that system.

**Priority:** Must have

## External Interface Requirements

**EIR1Appearance of Interface**

The user interface should use Microsoft Windows standards for the appearance of scroll bars, buttons, menus, etc where appropriate.

## Performance Requirements

**PR1 Maintaining buzzer press ordering**

For US6, it is essential that when the ordering of participant buzzer button pressing is maintained and that the participant who presses their buzzer first is the participant selected for answering a question.

**PR2 Buzzer press has low latency**

For the quiz to feel fast and quick fire, it is important that buzzer presses by participants are communicated to other participants and the quiz host within half a second.

**PR3 Target computer for system**

All software produced should run correctly on Information Services PCs or PCs maintained by the faculty.

## Design Constraints

**DC1 Use of Java**

It is corporate policy to use Java on all major new developments, and so Java will be used for all coding on this project.

**DC2 Use of sockets**

Sockets using TCP will be used when implementing communication between the participant PCs and the quiz host PC. See the provided proof-of-concept example code. Using sockets will provide good realtime support during the quiz.

**DC3 Pluggability**

It is important that the architecture of the software makes it relatively easy to create new kinds of game for the Buzzer round, Pairs round and Tablet round.

## Other Requirements

The project will be developed in line with the group project QA plan, detailed in [1].

**References**

1. Loftus, C.W., “Software engineering group projects - quality assurance plan. Technical Report SE.QA.01”, 3.0, Computer Science Department, 27th June 2023
2. Wikipedia, “Richard Osman’s House of Games” (Online) <https://en.wikipedia.org/wiki/Richard_Osman%27s_House_of_Games> (Accessed 4th December 2023)
3. Loftus, C.W., “Software engineering group projects – user interface prototype standards. Technical Report SE.QA.04”, 2.0, Computer Science Department, 28th June 2023
4. Loftus, C.W., “Software engineering group projects – design specification standards. Technical Report SE.QA.05”, 3.0 (CS/CC22120), 2.0 (CS22220), Computer Science Department, 28th June 2023
5. Computer Science Department (2023), “Student Handbook” (Online) <https://impacs-inter.dcs.aber.ac.uk/en/cs-undergraduate/official-information/student-handbooks> (Accessed 4th December 2023)

**DOCUMENT HISTORY**

| *Version* | *Issue No.* | *Date* | *Changes made to document* | *Changed by* |
| --- | --- | --- | --- | --- |
| 0.1 | N/A | 4/12/23 | N/A - original draft version | CWL |
| 0.2 | N/A | 6/12/23 | Added missing quiz maintainer stories and DC2 | CWL |
| 1.0 | N/A | 13/12/23 | Adding story priotities and acceptance tests | CWL |