

Software Engineering Group Project - UI Specification

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1. INTRODUCTION

1.1 Purpose of this document

This document's purpose is to describe the specifications for the User Interface. These specifications will detail how to meet the criteria set out by SE.QA.04 [1] and how to create and design the interface effectively, while meeting the requirements provided in the requirements specification [2].

It also aims to support the document that should be supplied alongside this one, the UI Presentation (UI-Spec-Pres-GP9.pptx).

1.2 Scope

This document explains the specifications for creating the User Interface. This document should be read by all team members, most notably any members that are producing content related to the user interface.

It is assumed that the reader is already aware of the details laid out in SE.QA.04 [1].

1.3 Objectives

The objective of this document is to:

1. Identify the potential users of the system, and discuss how best to cater to each user's needs.
2. Describe the variety of use cases that need to be considered, and describe the steps involved to satisfy each use case.
3. Consider the possible error conditions that may arise during operation of the system, and how to overcome these in a way that follows good UI design practice.

2. TYPICAL USERS

This section will discuss the different types of typical users that will be interacting with the system via the user interface.

2.1 Beginner

Beginners that are new to Chess or have little experience are likely to be a significant part of the user base, and are the focus of the design. As a “Chess Tutor” program, the system will be looking to educate players on the different moves that can be made at any given stage.

Tony is a teenager that wants to learn how to play chess. He has only played once before, so is aware of the very basic concept. Tony wants to learn about how each of the pieces move, in what situations they can capture other pieces, and under what circumstances they cannot be moved.

2.2 Intermediate

Intermediate users that have some experience in playing chess and understand the basics of the game may want to advance their skills by studying their previous games. Intermediate users have mastered the basics of the game such as piece movement and are now looking to improve their decision making and learn from prior mistakes.

Sam is an intermediate player that has already learnt the basics of chess after playing with their friend for many months. Sam intends to improve their game by studying their previous matches and analysing their moves. To do this, they would like to be able to replay their previous games in a move by move manner.

2.3 Experienced

Experienced users that have significant experience will want minimal interruption when playing a game, and are content with little to no assistance. They will likely want to practise independently of the system against another player. They may even be tutoring their opponent and would like the option to replay previous games to help their tutee improve.

Beth is an experienced player, and knows the game of chess well. She enjoys challenging people to games and competing against others. Being able to play the game quickly and make independent decisions is important to Beth. Beth is also helping her friend Pete to improve at chess. It is important she can replay her previous games with Pete to explain concepts that can help him improve.

2.4 Casual

Casual players can have any level of experience, and are less concerned about improving or learning and would prefer to simply have fun. Being able to use the system easily, quickly, and dynamically is important to casual players.

Alaw is a casual chess player that spends a lot of time travelling on public transport. He would like to play chess whilst he travels, and sometimes feels like practising to improve, at other times he simply wants to play a game of chess against himself or a friend.

3. USE CASES

The following section will discuss the various use cases relating to the system and its users.

UC-0.0: Starting a New Game (FR1, FR2, FR3)

After launching the application and reaching the main menu, the user can select to begin a new game. Upon selecting the “Start New Game” option, the user will be prompted to enter the names and respective piece colours for both players. After confirming the names, the user will then be shown the new board with white pieces at the bottom of the screen and black pieces at the top. The game is ready to be played, indicating that it is the white pieces and respective player’s turn to move.

UC-0.1: Restoring a Previous Game (FR1, FR11)

After launching the application and reaching the main menu, the user can select to load a game. Upon selecting the “Load Unfinished Game” option, the user is shown a screen that lists the save files. Once the user has selected the save file to load into the application, the board will be set, and the pieces placed into their positions, and then the game will be ready to play.

UC-1.0: Selecting a Piece (FR3, FR4)

The player whose turn it is will be indicated on the screen. The user can select a piece by clicking on it in the game window. The square the piece is on will be highlighted to indicate that the user has selected it. The board will highlight the legal movements that the selected piece can make, or which of the opponent's pieces may be captured.

The player may choose to select a different piece after their initial selection by simply clicking on another of their own pieces. The selected piece will then switch from the former to the new selection. This will be shown by the highlighted square changing so that the square containing the newly selected piece is highlighted.

UC-1.1: Moving a Piece (FR3, FR5)

To move a piece, the player will be able to click on any of the highlighted sections of the board. Once the move has completed, the user will see that the selected piece has now moved from its previous position to the new position.

UC-1.2: Capturing a Piece (FR3, FR5)

To capture an opponent's piece, the player can select any of the highlighted board squares containing opposition pieces. After selecting the target piece, the user's piece will reappear in the new position, and the opponent's piece will be placed outside of the board, signifying a successful capture.

UC-1.3: Castling (FR3, FR4, FR5)

Castling will be represented visually, the same as other legal moves for the king. As the move involves the movement of both the rook and king pieces, the possibility for castling will only be shown when the king piece is selected and the conditions are met.

UC-1.4: Double Step (FR3, FR4, FR5)

Double steps will be represented visually, the same as other legal moves for the pawn. The possibility for double stepping will only be shown if the selected pawn has not yet moved from its starting position.

UC-1.5: En Passant (FR3, FR4, FR5)

En passant will be represented visually, the same as other legal moves for the pawn. The possibility for capturing by en passant will only be shown when the conditions are met, i.e. the move immediately after the opponent pushes a pawn two spaces to land beside the current player's pawn.

UC-1.6: Promotion (FR3, FR4, FR5)

When a pawn reaches the furthest rank the player will be prompted to select which piece it will be promoted to, the player will be required to choose one of the pieces before their turn can end. This move will not be visually represented any differently than other pawn moves until the move is played.

UC-2.0: Quitting a Game (FR9)

At any point during the game, the player may choose to exit and return to the main menu. To do this, the player can select the "Quit" button and will then be prompted to confirm their choice to quit. Upon confirmation, the game will save its state to be loaded again, and the user will be returned to the main menu screen.

UC-3.0: Reviewing a Previous Game (FR10)

After reaching the main menu, the user can select to view a previous game by clicking the "View Finished Game" button, which opens a list of save files available to be loaded. Once the user has selected the relevant save file to load into the application, the board will be set, and the pieces placed at their beginning positions.

Arrow buttons will appear on the screen to show “Step Forward” or “Step Backwards”. When the forward arrow button is selected, the next change to the game board will be executed, and when the backwards arrow button is selected, the last change will be reverted. The resulting board state will be the next or previous state of the board according to the save/log file.

UC-4.0: End Of Game (FR8)

Either player may choose to end the game on their turn by clicking a “Resign” button. Upon clicking this button, the user will be notified that the game will be saved for replay at a future point, and that their opponent won the game. The players may also end the game by clicking an “Offer Draw” button on their turn, which will prompt the other player with “Yes” and “No” buttons; should the opponent disagree, the player who offered the draw must take their turn and the “Offer Draw” button disappears for the turn, otherwise the user will be notified that the game will be saved and that it ended in a draw.

These buttons are only available to the player during their turn.

UC-4.1: Detecting Check (FR6)

When the program detects that a king is in check, it will notify the user by highlighting the square(s) containing the attacking piece(s), and the square containing the player's king in different colours.

UC-4.2: Detecting Checkmate (FR7)

If the program concludes that a player is in checkmate, the game will end and the program will display which of the players has won. The user will then be notified that the game will be saved for future viewing.

4. ERROR CONDITIONS

The following error conditions aim to address how to handle unintentional scenarios or illegal moves/states.

EC-0.0: Attempted Illegal Move (FR5)

After the user has selected a piece (UC-1.0), they will be shown valid positions to move the piece to. If the player attempts to select a position that is invalid for any reason, the application will highlight the target position but not move the piece. The user can then select another one of their pieces and the valid moves will be displayed.

EC-0.1: Attempted Illegal Capture (FR5)

After the user has selected a piece (UC-1.0), they will be shown valid positions to move the piece to. If the player attempts to capture an opponent's piece that cannot be captured for any reason, the application will highlight the target piece but not capture it. The user can then select another one of their pieces and the valid moves will be displayed.

EC-0.2: Attempted Illegal Special Move(FR5)

After the user has selected the King, it will be highlighted as described in UC-1.0. If the user then tries to castle by selecting a Rook, while castling is not a legal move, the square containing the Rook will be highlighted but the castling will not take place. The same is true of an attempted illegal en passant, the square diagonal to the pawn will be highlighted but the move will not take place. The user can then select another one of their pieces and the valid moves will be displayed.

REFERENCES

- [1] QA Document SE.QA.04 - User Interface Specification Standards
- [2] Chess Tutor Requirements Specification

DOCUMENT HISTORY

Version	Issue No.	Date	Changes made to document	Changed by
0.1	N/A	15/02/23	Document created.	TYW1
0.2	N/A	20/02/23	Incl. references to functional requirements.	TYW1
0.3	N/A	20/02/23	Updated authors of document. General formatting.	TYW1
0.4	N/A	22/02/23	Removed duplicate use case (UC-0.3).	TYW1
0.5	N/A	23/02/23	Minor adjustments to content.	TYW1
0.6	N/A	01/03/23	Moved into review process and version control.	TYW1
0.7	N/A	01/03/23	Adjusted content as per the review meeting.	SEH25
0.8	N/A	01/03/23	Adjusted content as per the review meeting.	JAT92
1.0	N/A	02/03/23	Document released.	TYW1
1.1	N/A	09/03/23	Adjusted content as per the feedback.	SEH25
1.2	N/A	5/10/23	Minor adjustments to reflect change in button names and highlighting behaviour.	JAT92
2.0	N/A	11/05/23	Document re-released	TYW1