

# Requirements and Analysis Document for

# PaintIT

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# 1. Introduction

The project aims to create a desktop version of the popular mobile game "Draw Something" developed by OMGPop[1]. It is a two player game where one player draws a given word and the other player then guesses what word that has been depicted. The game is simple, fun and suitable for all ages. The purpose of the application is to bring people together with this interactive offline experience while enhancing creativity in people. Furthermore the game is very educational for children, both for spelling and drawing.

## 1.1. General characteristics of application

PaintIT is an offline collaborative desktop application resulting in a gameplay consisting of users gathering around one computer and taking turns painting and guessing.

When starting the game, two players create a team. One of the players (from now on referred to as the guesser) is advised to look away whilst the other player (from now on referred to as the painter) is presented with three words, each with a different level of difficulty attached to them. The painter's task is to first choose one word out of the three that are presented and the painter is then supposed to paint the chosen word with enough accuracy that the guesser will be able to correctly guess the word. When the painter has finished the painting, it is time for the guesser to guess what the painting portrays using a set amount of tiles containing letters. The amount of points given at the end of each round depends on the difficulty level of the chosen word. Easier words are worth fewer points while harder words are worth more points, ranging from 1-3 points each.

The intention of the game is to collect as many points as possible during a game session. In order to keep gathering points, the players need to paint and guess the word within the given time constraint. The *painter* has 60 seconds to finish their painting and the *guesser* has 30 seconds to guess the correct word. Failing to guess the correct word within the set time will result in the end of a game session and the players receive the score of the points which they have accumulated throughout the session. The best scores are saved on the high score which can be viewed at any time from the main menu.

## 1.2. Definitions, acronyms, and abbreviations

Below follow words that are used throughout the working process.

### 1.2.1. General words used throughout document and development

- **MVC** - Model View Controller.
- **JavaFX** - The standard GUI library for Java.
- **UI** - User Interface.
- **Design pattern** - Design patterns as it is referred in programming.
- **Visual design pattern** - Visual design pattern as it is refereed in "Designing Interfaces" [2].

### 1.2.2. Words explaining the game

- **Painter** - The player that is being presented with a word which he is supposed to paint on the canvas.
- **Guesser** - The player that is supposed to guess the word that the other player/the painter has painted.
- **Canvas** - The canvas contains the painting painted by the painter, which is also shown to the guesser.
- **Round** - A round consists of a word being chosen, painted and guessed, either incorrectly or correctly.
- **Game session** - A game session starts when 2 players have entered their names and ends either when they decide to quit or when they fail to guess the correct word in time.
- **Tiles** - There are eight tiles in total, each representing one letter. The guesser uses the tiles to guess the word that is depicted.
- **Streak** - The team's streak is the amount of points gathered from correct guesses throughout a game session.

## 2. Requirements

In this section the requirements for the application are presented. They are used as a guide throughout the process of creating the application.

### 2.1. User Stories

The requirements for the application are given from *User Stories* see Appendix A.1.

### 2.2. Functional Requirements

The user Stories can be somewhat summarised into a list containing functional requirements, functional requirements and the user stories act as a guide of what to functionality implement throughout the project. Below is a summary of what players should be able to do, they should be able to:

1. Navigate around the main menu.
  - a. Be able to read the rules.
  - b. Look at the highscore
  - c. Go to the game setup screen.
    - i. Choose the player names
    - ii. Choose timelimit.
    - iii. Choose difficulty.
2. Play the game.
  - a. The Painter should be able to:
    - a. Paint on the canvas using the
      - i. Brush
      - ii. SprayCan
      - iii. Eraser

- b. Choosing color to paint with.
  - c. Choosing the radius to paint with.
  - d. Clear the entire canvas.
  - e. Undo the latest stroke of paint.
- b. The Guesser should be able to:
  - a. See the painted canvas.
  - b. See a selection of eight tiles.
  - c. See an empty word sequence.
  - d. Guess the word by:
    - i. Moving the given tiles to the word sequence.
    - ii. Removing tiles from word sequence.
    - iii. Asking for hints.
  - e. Give up.
- c. At the end of the round select to start a new round or end game session.
- 3. Exit the application and save game-streak.

## 2.3. User interface

Navigation throughout the application uses UI Design patterns from "Designing Interfaces" written by Jenifer Tidwell[2]. The interface is created for its simplicity, primarily the interface suits the inexperienced user.

### 2.3.1. General Navigation

The general navigation of the application makes use of the keyboard and mouse. Keyboard shortcuts are available whenever it is deemed necessary, for example, when guessing the word users can use the keyboard to add or remove letters from their guess. Given Figure 1 it was deemed reasonable that the user would be able to press the E-key on the keyboard, or click on an E-tile with the mouse to complete the guess.

Further, it was deemed suitable that pressing BACKSPACE on the keyboard would remove the rightmost letter from the guess (in Figure 1 that would be the letter L), and clicking any letter in the guess would put it back to the wordtiles.

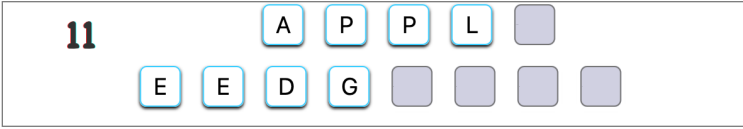


Figure 1: The GuessingView with an almost correctly guessed word

**2.3.2. The painting aspect**

Painting is one of the main spect of the game, below follows a summary of the iterations and design choices made for the painting view.

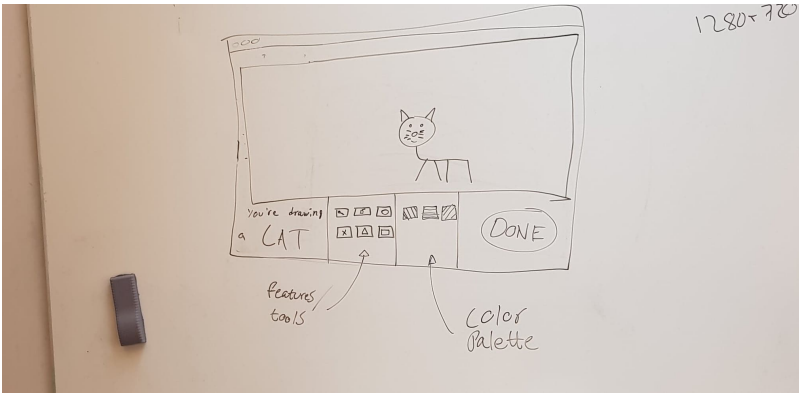


Figure 2: The first sketch of the painting view

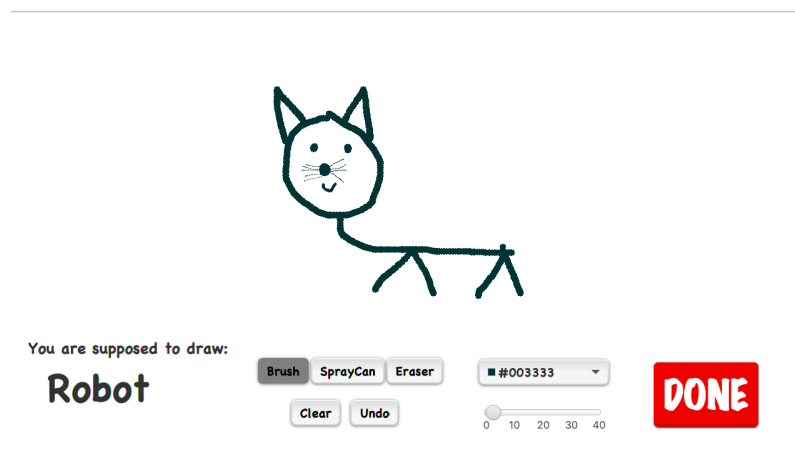


Figure 3: The first iteration of the painting view

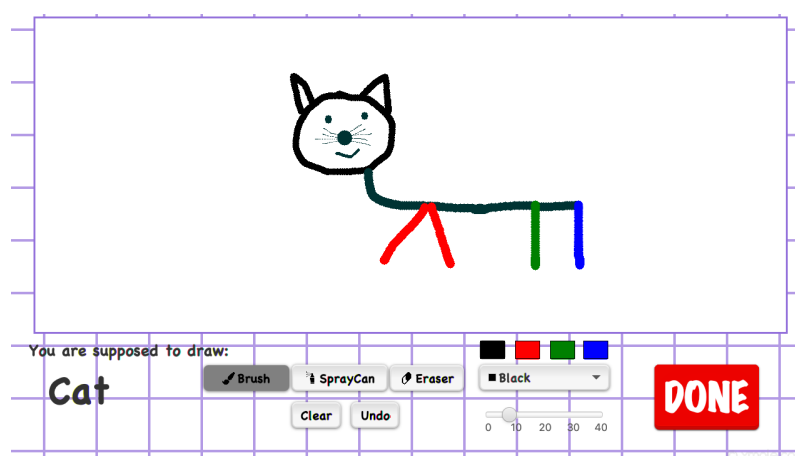


Figure 4: The second iteration of the painting view

The sketches for the painting view was created early on in the working process, see Figure 2, and acted as a template for how the view would be developed. The first iteration of the painting view, see Figure 3, gave us useful feedback, it was noted that it needed to be more obvious where the canvas was, it needed to be more colour as well as the opportunity to select colours quicker. As seen in Figure 4, the boundaries of the canvas is clearer, it became possible to quickly select basic colors, icons was added to the tools (brush, spraycan and eraser) and the view appears to be more coherent.

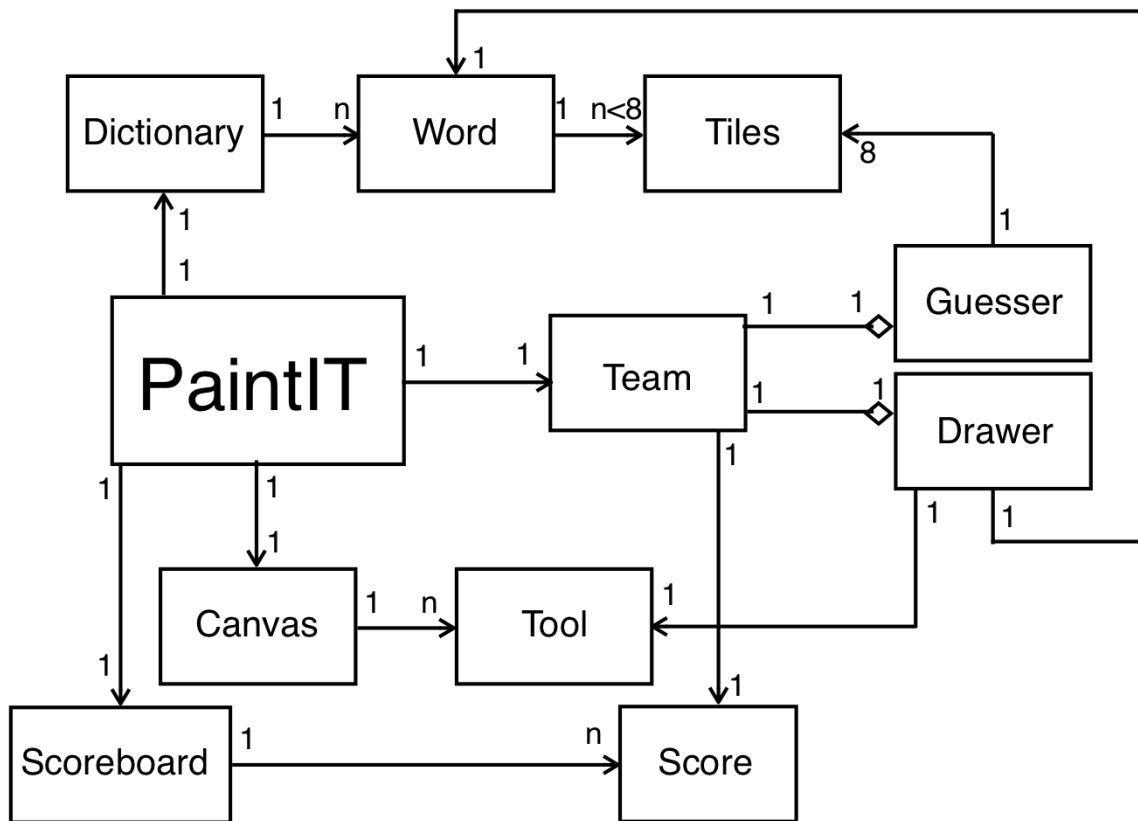
Below follow some of the design patters implemented in the paintingview:

- **Canvas Plus Palette** - Canvas Plus Palette is the basis on the entire view, it is implemented with a scarce amount of tools in an attempt to simplify the painting experience.



- **Prominent Done Button** - A prominent done button is placed in the right bottom corner, following the visual flow of the application, the button stands out and it is clear what will happen when clicked.
- **Button Groups** - Button Groups are used to arrange the different adjustments you can do to the tool and the canvas. Adjusting size, color and tool is placed on the righthand side while buttons for manipulating the canvas directly (by clearing or undoing) is placed on the bottom left, see Figure 4

### 3. Domain model



#### 3.1. Class responsibilities

**Canvas** - The canvas is used by the drawer/painter to depict whatever the current word is. During a round of gameplay there exists only one instance of a model of the canvas, but there actually exists two different views of that model. One of the views belongs to the painter, on which he/she can paint on. The second view belongs to the guesser, but it has no functionality whatsoever, e.g. it can not be drawn on, only viewed.

**Dictionary** - Class responsible for supplying words of different difficulty from which the painter can choose from. The dictionary contains words from three distinct difficulties: easy, medium and hard. There exist no formal criteria when a word is being classified as either difficulty, it is totally up to the programmer(s) to decide.

**ScoreBoard** - The ScoreBoard holds a collection of 10 Scores, representing the 10 high-

ests streaks ever achieved. A Score consists of a team name (String) and a corresponding streak (int). ScoreBoard presents it's collection of Scores as a list, sorted by streak in descending order (highest - lowest).

Team - There is only one instance of a team during a round of gameplay. The team holds two players, a team name and a streak supposed to represent how well the team is doing.

During a round of gameplay each player is assigned a role (Drawer or Guesser). Team represents this as an inner state, where each player is contained in an instance variable Drawer or Guesser, both of type Player. The roles of the two players are swapped after each finished round.

## References

- [1] Wikipedia. "Draw Something". [Online]. Available: [https://en.wikipedia.org/wiki/Draw\\_Something](https://en.wikipedia.org/wiki/Draw_Something), retrieved: 2018-10-10.
- [2] Jennifer Tidwell. *Designing Interfaces*. uppl. 2, Kalifornien, USA, O'Reilly Media, Inc, 2013.

## **A. Appendix**

### **A.1. User Stories**

The User Stories are listed with falling priority. The identifier can be found in the subsection numeration for each User Story.

#### **A.1.1. Colour The Canvas**

As an Artist, I need to be able to add colour to a canvas so that I can create art digitally.

##### **Confirmation**

- If I drag the mouse on the canvas, will there be color?
- If I drag the mouse outside the canvas does it not draw?
- Am I only able to draw on the canvas during the drawing-phase of the game?

#### **A.1.2. Letters**

As a guesser in the game I need to receive tiles to make a guess from so that the guess is a bit easier.

##### **Confirmation**

- Can I build the correct word with the given letters?
- Are the tiles easy to see and choose from?
- Can I see which Tiles that are included in my guess?
- Can I only use a guess tile once in my guess?

#### **A.1.3. Guess the word**

As a player, I need to be able to guess the word corresponding to my friends painting in order for us to proceed with the session.

##### **Confirmation**

- Can I use the keyboard to make a guess?
- Can I use the mouse and click to make a guess?
- Do I receive feedback whether the guess was correct or not?
- Can I Guess many times?

#### **A.1.4. Start menu**

As a player, I want to be greeted by a startmenu when I start the game so that I can start playing easily.

##### **Confirmation**

- Is a startmenu shown when the application starts?
- Does the startmenu direct the player so that he can start the game?

#### **A.1.5. Finishing a painting**

As a drawer in the game, I need to be able to finish a painting so that the guesser can make his guess.

##### **Confirmation**

- Can I my mark my painting as done?
- Will it be the other players turn if I mark my painting as done?
- Is the painting shown to guesser
- Is the painting unmutable after I mark it done?

#### **A.1.6. See the finished painting**

As a guesser, I need to be able to see the painting so that I can guess what it depicts.

##### **Confirmation**

- Can I see the painting on the canvas?

- Is the correct word not shown to the guesser?

### **A.1.7. Advanced drawing (EPIC)**

As an artist, I need to be able to use different colors and tools in order to make a detailed drawing.

#### **Confirmation**

- Can I change the color which I am using?
- Can I change the drawing tool that i am using?
- Can I change the size of the tool I am using?
- Am I able to find the functionality above?

### **A.1.8. Erase**

As an artist, I need to be able to erase what Ive painted so that its easier for me to correct myself when Ive drawn wrong.

#### **Confirmation**

- Can I erase color from the canvas?
- Can I choose what parts of the canvas I want to erase?

### **A.1.9. Choose color**

As an artist, I need to be able to choose color when I paint digitally so that I can draw with more detail.

#### **Confirmation**

- Can I change color when Im drawing?
- Are the colors easy to choose from?

#### **A.1.10. Undo the canvas**

As a painter in the game, I need to be able to undo my last action so that it's easier for me to make a good painting.

##### **Confirmation**

- Can I undo my last action?
- Can I undo all my previous actions?
- Can I undo using keyboard shortcuts?

#### **A.1.11. Picking names**

As a player, I need to have the ability to choose a name so that it can be shown in the game.

##### **Confirmation**

- Can I add name to the players?
- Is the name used to adress the players throughout the game?

#### **A.1.12. Countdown**

As a player of this game, I need to get a countdown before the guessing-phase so that the guesser has time to prepare.

##### **Confirmation**

- Can I see how long time it is left before my turn starts?
- Do I have enough time to turn the computer around for the guesser?
- Is it clear when my turn starts?

#### **A.1.13. Receive relevant words**

As a player, I need to receive words that Im able to paint and guess.



### **Confirmation**

- Are users able to paint the words given?
- Are the users enjoying to draw the words given?
- Are the user able to choose the difficulty of the word?

### **A.1.14. Scoreboard**

As a competitive player, I want to be able to see all best scores on a scoreboard so that I can compete with them.

### **Confirmation**

- Can I keep track of my score while the game progresses?
- Can I see other players highscores?
- Can I get on to the Scoreboard if I make a good score?

### **A.1.15. How to play**

As a beginner, I need to get instructions/rules so I can play the game properly.

### **Confirmation**

- Are the instructions easy to find at all stages in the game?
- Can a new player read the rules/instructions and understand how to play?
- Can I reach How to play when Im playing a game?
- Can I go back from How to play without restart the application?

### **A.1.16. Hints**

As a player, I need to be able to get a hint that makes it easier to guess the word drawn so that I dont get stuck.

### **Confirmation**

- Can I reveal one or more letters in the correct word?
- Can I limit the letters I have to guess from?
- Is there a consequence/cost for the player getting a hint?

#### **A.1.17. Game Sound**

As a player of the game I want to be able to hear sounds, to make the game more fun and interactive.

##### **Confirmation**

- Can I choose whether or not I want the game to play sounds?
- Does the sound enhance the game experience?
- Are sounds implemented to relevant actions in the game. Clicking a button, make a stroke with the brush, selecting the spray can etc.