
SOFTWARE REQUIREMENTS SPECIFICATION

CS346: SOFTWARE ENGINEERING LABORATORY

**Group 11
Project 7: Paint Application**

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1 Introduction

This Software Requirement Specification (SRS) Document describes an android/web application that provides children to draw, paint, and create their own art along with having fun.

1.1 Purpose

The purpose of this document is to build an offline painting application to aid children to develop their mobility and creativity skills.

1.2 Document Conventions

The format specified by IEEE was followed while creating this document.

- User: Person interacting with the application
- SRS: Software Requirements Specifications
- APK : Android Package

1.3 Intended Audience and Reading Suggestions

This project is a prototype of the paint application for children of five to nine years age. The intended audience for this SRS is Professor Samit Bhattacharya, who is in charge of the CS-346: Software Engineering course.

1.4 Project Scope

The software that this SRS specifies is the Creative Paint (CP) Application. Its goal is to create a convenient and easy-to-use application for children, trying to have fun while drawing. Above all, we hope to provide a comfortable user experience.

1.5 References

IEEE, IEEE Standard 830-1998 IEEE Recommended Practice for Software Requirements Specifications, IEEE Computer Society, 1998.

1.6 Overview

The remaining part of the SRS contains:

- The Overall Description and Functioning of the Software
- Specific Requirements:
 - Functional - defining the fundamental actions that the software incorporates in accepting and processing the inputs and corresponding outputs.
 - Non-Functional - software system attributes that are used to judge the operation of the system.

2 Overall Description

2.1 Product Perspective

The product described in the document is a Paint App. It is a stand-alone Android application that can be launched after installing via a standard freely-distributed APK file. The product is envisioned to give children of the age group 5yrs to 9yrs a platform to explore their creative skills. It aims to provide a user friendly experience to them. Equipped with two different modes: 1)Game Mode 2)Practice Mode, the paint app offers a wholesome experience to art lovers.

2.2 Product Functions

Functions included in the final app will be as follows:

1. Paint App Start Menu
2. Practice Mode
3. Game Mode
4. My Work Mode
5. Inspiration Mode

2.3 User Classes and Characteristics

Information regarding users who can use the app:

1. Our app is targeted mainly for children between age range 5-9 years.
2. Children who just wanted to play for fun of any age.
3. Children who wanted to develop their art skills starting from basic levels.

The intended users for the product will have the following characteristics:

1. Able to understand the functioning and operation of the software on a basic level.
2. Able to afford and use a mobile app following the minimum hardware and software requirements.
3. The user is able to understand English.
4. The users of all ages can use our app.

2.4 Operating Environment

Our app will work on an android device with at least 512 MB RAM.

2.5 Assumptions and Dependencies

Performance of the app will depend on hardware configuration of device and operating system in use. Assumptions:

1. Device uses Android 5 or higher / API level 24 or higher.
2. Touch screen

3 Functional Requirements

3.1 Paint App Start

Input: App Icon

Output: List of Options

Description:

When user starts the app, the main menu appears on the screen. Main menu consists of options like practice mode, game mode, my work and motivation.

3.1.1 Practice Mode

Input: Practice Mode

Output: List of Modes

Description:

Practice mode offers two options: Free Style and Image Practicing.

3.1.1.1 Freestyle Mode

Input: Freestyle Mode

Output: Drawing boards Layouts

Description:

User is prompted to select a drawing board from different choices to practice his/her skills.

3.1.1.1.1 Drawing Board Layout

Input: Drawing Board Layout

Output: Drawing board and Toolbox

Description:

User selects a board from given alternatives. A toolbox along with white board appears.

3.1.1.1.1.1 Toolbox

Description:

User has various tools which he/she can use it to draw or paint. It appears along with the drawing board layout. It offers the following tools for the drawing.

3.1.1.1.1.1 Pencil Tool

Input: Size and Colour

Output: Pencil

Description:

User can choose a pencil with a specified size and colour.

3.1.1.1.1.2 Select Eraser

Input: Size

Output: Eraser

Description:

User can choose a pencil with a specified size and colour.

3.1.1.1.1.3 Brush Tool

Input: Size and Colour

Output: Brush

Description:

User can choose brush to draw an image. He/She has the option to choose a size of the brush.

3.1.1.1.1.4 Colour Fill

Input: Colour and Image

Output: Coloured Image

Description:

User can fill colour in an image. He/she has to choose a color and image in which they want to fill the colour.

3.1.1.1.1.5 Select Shape

Input: Size and Colour

Output: Pencil

Description:

User will be given different types of the shape to choose from. He/She will select the shape and it will appear on the board.

3.1.1.1.1.6 Undo

Input: Type

Output: Shape

Description:

User will use this option to revert back or undone the recent work done.

3.1.1.1.1.7 Save Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to save his work so that they can see it in future.

3.1.1.1.1.8 Share Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to share their artwork on social media.

3.1.1.2 Image Practicing Mode

Input: Image Practicing Mode

Output: Drawing board Layouts

Description:

User is prompted to select a drawing board from different choices to practice his/her skills.

3.1.1.2.1 Drawing Board Layout

Input: Drawing Board Layout

Output: Drawing board and Toolbox

Description:

User selects a board from given alternatives. A toolbox along with white board appears.

3.1.1.2.1.1 Image Selection

Input: Image

Output: Drawing board, Toolbox and Image

Description:

User selects an image from given alternatives. A toolbox and white board along with a selected image appears.

3.1.1.2.1.2 Toolbox

Description:

User has various tools which he/she can use it to draw or paint. It appears along with the drawing board layout. It offers the following tools for the drawing.

3.1.1.2.1.1.1 Pencil Tool

Input: Size and Colour

Output: Pencil

Description:

User can choose a pencil with a specified size and colour.

3.1.1.2.1.1.2 Select Eraser

Input: Size

Output: Eraser

Description:

User can choose a pencil with a specified size and colour.

3.1.1.2.1.1.3 Brush Tool

Input: Size and Colour

Output: Brush

Description:

User can choose brush to draw an image. He/She has the option to choose a size of the brush.

3.1.1.2.1.1.4 Colour Fill

Input: Colour and Image

Output: Coloured Image

Description:

User can fill colour in an image. He/she has to choose a color and image in which they want to fill the colour.

3.1.1.2.1.1.5 Select Shape

Input: Size and Colour

Output: Pencil

Description:

User will be given different types of the shape to choose from. He/She will select the shape and it will appear on the board.

3.1.1.2.1.1.6 Undo

Input: Type

Output: Shape

Description:

User will use this option to revert back or undone the recent work done.

3.1.1.2.1.1.7 Save Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to save his work so that they can see it in future.

3.1.1.2.1.1.8 Share Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to share their artwork on social media.

Game Mode

Input: Game Mode

Output: List of Levels

Description:

Game mode starts. It is the game zone of the app where the user has many levels of the game to take part. The user can choose the current unfinished level or from the levels which the user has finished.

3.1.2.1 Select a Level

Input: Level

Output: Drawing board Layouts

Description:

User is prompted to select a drawing board from different choices to practice his/her skills.

3.1.2.1.1 Drawing Board Layout

Input: Drawing Board Layout

Output: Drawing board and Toolbox

Description:

User selects a board from given alternatives. A toolbox along with white board appears.

3.1.2.1.1.1 Toolbox

Description:

User has various tools which he/she can use it to draw or paint. It appears along with the drawing board layout. It offers the following tools for the drawing.

3.1.2.1.1.1 Pencil Tool

Input: Size and Colour

Output: Pencil

Description:

User can choose a pencil with a specified size and colour.

3.1.2.1.1.2 Select Eraser

Input: Size

Output: Eraser

Description:

User can choose a pencil with a specified size and colour.

3.1.2.1.1.3 Brush Tool

Input: Size and Colour

Output: Brush

Description:

User can choose brush to draw an image. He/She has the option to choose a size of the brush.

3.1.2.1.1.4 Colour Fill

Input: Colour and Image

Output: Coloured Image

Description:

User can fill colour in an image. He/she has to choose a color and image in which they want to fill the colour.

3.1.2.1.1.5 Select Shape

Input: Size and Colour

Output: Pencil

Description:

User will be given different types of the shape to choose from. He/She will select the shape and it will appear on the board.

3.1.2.1.1.6 Undo

Input: Type

Output: Shape

Description:

User will use this option to revert back or undone the recent work done.

3.1.2.1.1.7 Save Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to save his work so that they can see it in future.

3.1.2.1.1.8 Share Image

Input: Size and Colour

Output: Pencil

Description:

Users will be able to share their artwork on social media.

3.1.2.1.1.8 Submit

Input: Image

Output: Rewards

Description:

Image is processed and according to percentage of level completion, rewards are given.

3.1.2 My Work

Input: My Work Mode

Output: Images

Description:

In this section the user can see all the work he/she has saved in the past. All of his/her past paintings are present in this section.

3.1.3.1 Delete Images

Input: Images

Output: Dialogue Box

Description:

On clicking the delete option a dialogue box appears. It has two operation types which user can select: 1) Cancel 2) Delete.

3.1.3.1.1 Cancel Operation

Input: Cancel

Output: "My Work" Section

Description:

User will go one step back to My Work section where all his previous work is displayed hence cancelling the deletion.

3.1.3.1.2 Delete Operation

Input: Delete

Output: "My Work" Section xv

Description:

If user selects the delete operation, image is being deleted and user will go one step back to My Work section

3.1.3.2 Image Menu

Input: Image

Output: List of operations

Description:

On long pressing an image, options for renaming, deletion and sharing of that particular image appears.

3.1.3.2.1 Rename Image

Input: Image and Name

Output: Renamed Image

Description:

After entering the preferred name for the image by the user, image name changed to that name for easier future references.

3.1.3.2.2 Delete Image

Input: Image

Output: Image Deleted

Description:

On clicking the delete button of the image, a dialogue box appears to confirm deletion or not.

3.1.3.2.3 Share Image

Input: Image

Output: Image Shared

Description:

On clicking the share button of the image, different options (whatsapp, facebook, instagram) to share that particular image appears.

3.1.3 Inspiration

Input: Inspiration Mode

Output: Paintings

Description:

This section shows different drawable images to give an inspiration to the child and motivate him/her to draw. He/She can see different drawings by scrolling left and right. Images with drawing and its title appears.

4 External Interface Requirements

On clicking the share button of the image, different options (whatsapp, facebook, instagram) to share that particular image appears.

4.1 User Interfaces

Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.

4.2 Hardware Interfaces

The application has no designated hardware so there are no direct hardware interfaces.

4.3 Software Interfaces

The game will run on all devices supporting Android 5.0(Lollipop) API 21 and above.

4.4 Communications Interfaces

Only communication interface is the internet. It allows the user to share his/her art on social media.

5 Nonfunctional Requirements

5.1 Performance Requirements

512MB RAM: Better and more RAM will help in loading the pages instantly.

5.2 Availability

The system will be available for use whenever the user deems necessary 24/7. The system shall allow users to restart the application after failure of the app with the earlier user saved works and settings.

5.3 Maintainability

The system will be updatable from software patches available through the App Store. Updates can be downloaded through the standard Android interface. Any discrepancies will be addressable by any developer as the coding will be done according to the coding standards of IEEE.

5.4 Portability

Since the app is developed using the android studio, it will run on any android device and windows supporting android applications. The paint software can be used on any Android phone satisfying the minimum hardware/software dependencies as specified in this SRS document previously. Installation of this application can be done through the standard Android File Manager, and this application can be shared through an APK file between devices.

5.5 Reliability

- The software will be able to run 99% of the time when launched.
- There is a potential for errors relating to the state of the operating system that could prevent the game from launching (for example not enough resources available, etc.). The chance of such an occurrence is at most 1%.
- The application will stop running if sent to run in the background, or the phone is accidentally powered off.
- The system will not be prone to errors caused by unexpected input.

5.6 Usability

5.6.1 Contextual Inquiry (CI)

One member from our team observed his 7 year old relative and another member did for his 9 year old neighbour. We set up our contextual enquiry in the following format. One of the contextual inquiry can be considered as active and another one as passive.

1. Plan

One of the sessions was physical and the other one was a recorded one. The goals of the session are planned as below:

- a) How do children learn to draw ?
- b) Main difficulty faced in drawing ?
- c) Preferred way of learning art by child ?
- d) How interested or enthusiastic is the child about art ?

2. Initiate

We took permission from our relatives regarding taking the feedback from their children. We had set up sessions of about 90 minutes each where the children did not formally know about it. The overall environment of the child was not disturbed and the interaction was casual yet professional.

3. Execute

- a) Recording the observations
- b) Asking relevant queries and clarifications

Patterns/Areas	Child A	Child B
Context of use	Primarily for school work, not interested in art in general.	Keen interest in art, uses this as a leisure and hobby activity.
Pain points and issues in physical drawing	Not getting hooked to it, difficulty in learning because of handling of material	Difficulty in handling material
Imagination and creativity	Good at imagining	He faces difficulty in drawing completely on his own
Interest and Enthusiasm	Not much enthusiasm in drawing as such in traditional method	Very much excited and enthusiastic about new prospects.
Parents interference and support	Parents do not want to give exposure to smartphones at this age.	Parents do not have time to monitor whether their child is learning properly.
Software, Applications	Uses smartphones under parents guidance.	Uses various applications and is quite familiar with digital entertainment as well as learning.

4. **Close** We thanked them for their cooperation and giving their ideas and suggestions regarding art.

5. **Reflect** Analyzing the data generated through Affinity diagram:



Figure 5.1: Affinity Diagram