SOFTWARE DESIGN DOCUMENT

CS346: SOFTWARE ENGINEERING LABORATORY

Group 11
Project 7: Paint Application

Siddhartha Jain 180101078
Varhade Amey Anant 180101087
Pulkit Changoiwala 180101093

Samay Varshney 180101097
Department of Computer Science and Engineering
Indian Institute of Technology Guwahati

Contents

1 Introduction

The Software Design Document describes the design interface of our software through Data Flow Diagram(DFD).

1.1 Purpose

The purpose of the Software Design Document is to provide a description of the design of a system fully enough to allow software development to proceed with an understanding of what is to be built and how it is expected to build. The Software Design Document provides information necessary to provide description of the details for the software and system to be built.

1.2 Overview of the Document

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

- The first chapter contains the Introduction part, which gives a basic idea about the project.
- The second chapter gives information about the Data Flow Diagrams.
- The third chapter gives information about the Process Decomposition Diagram.
- The fourth chapter gives information about the Entity-Relationship Diagrams.
- The fifth chapter gives information about the Data Dictionary.

1.3 References

- https://www.geeksforgeeks.org/introduction-of-er-model/
- https://www.visual-paradigm.com/guide/data-flow-diagram/what-is-data-flow-diagram/
- https://www.freeprojectz.com/entity-relationship/travel-and-travel-management-system-er-diagram/
- Software Engineering: A Practitioner's Approach, Roger S Pressman – Sixth Edition

2 Data Flow Diagrams
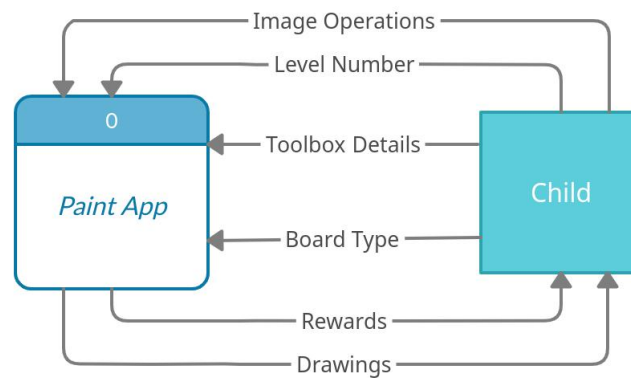
2.1 Level 0 Diagram

Figure 2.1: Level 0 DFD

- **Paint App:** Implements the Paint App by taking inputs from the child and communicates with the child through the mobile display.
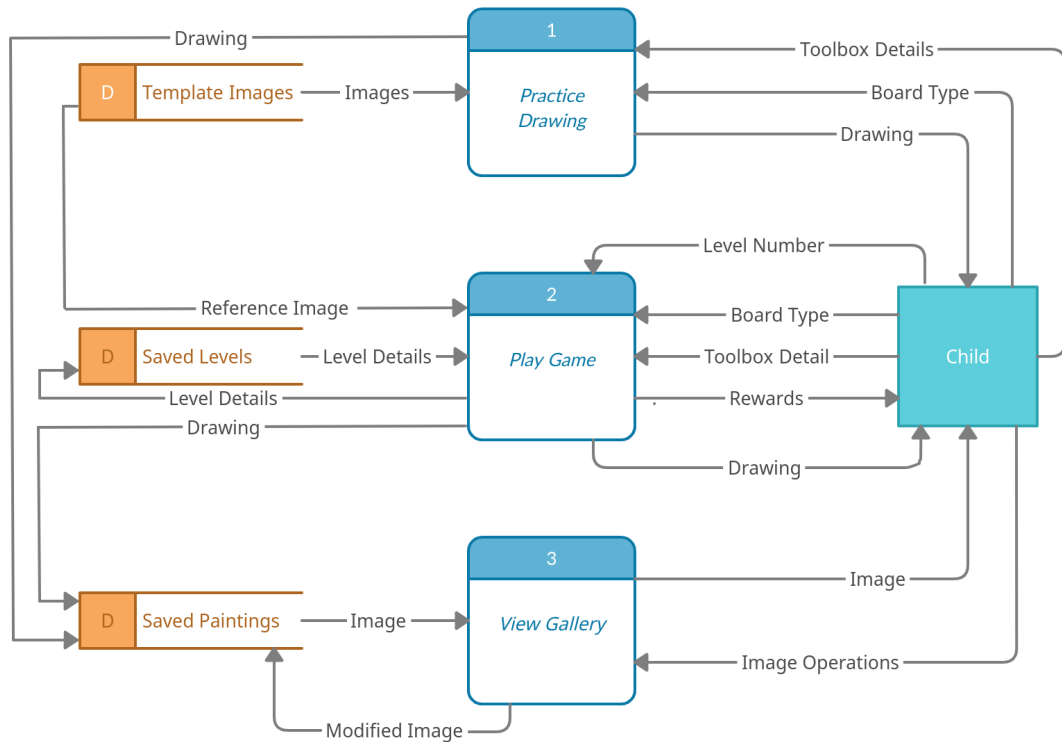
2.2 Level 1 Diagram

Figure 2.2: Level 1 DFD

- **Play Game Module:** Implements the painting game for the user. The user has to choose a level of the game and then he/she is presented with a reference image according to the chosen level.

- **Practice Drawing:** In this module, the user can practice drawing in a freestyle manner or from a reference image using image practising mode.

- **View Gallery Module:** It will display all the paintings saved by the user. The user will have the option to perform image operations like delete, rename, share and view the image.
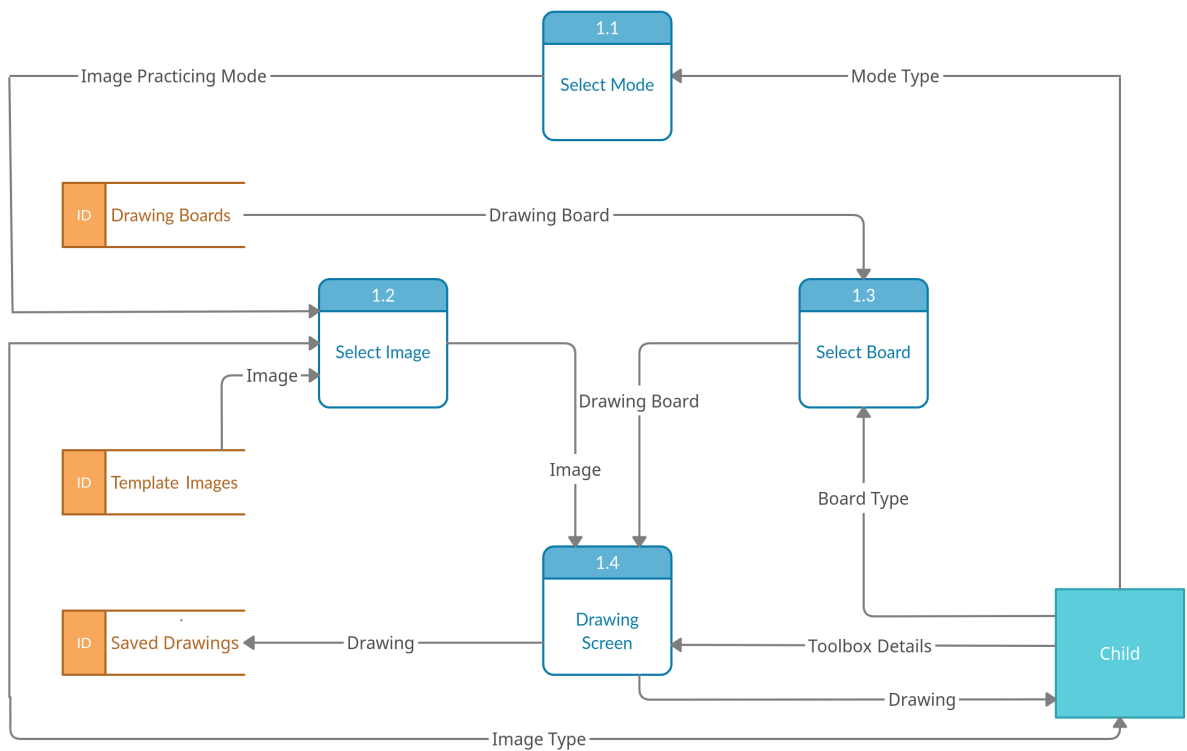
2.3 Level 2 Diagram

Figure 2.3: Level 2 Practice Mode DFD

2.3.1 Level 2 Diagram for Practice Module

- **Select Mode:** User selects the mode to practice on: freestyle or image practising mode.

- **Select Image:** The user selects the image for practising.

- **Select Board:** The user selects the drawing board to draw on.

- **Drawing Screen:** Provide the user with a drawing screen that contains all utilities (Reference Image, Board, Tool Kit) using which a user can draw.
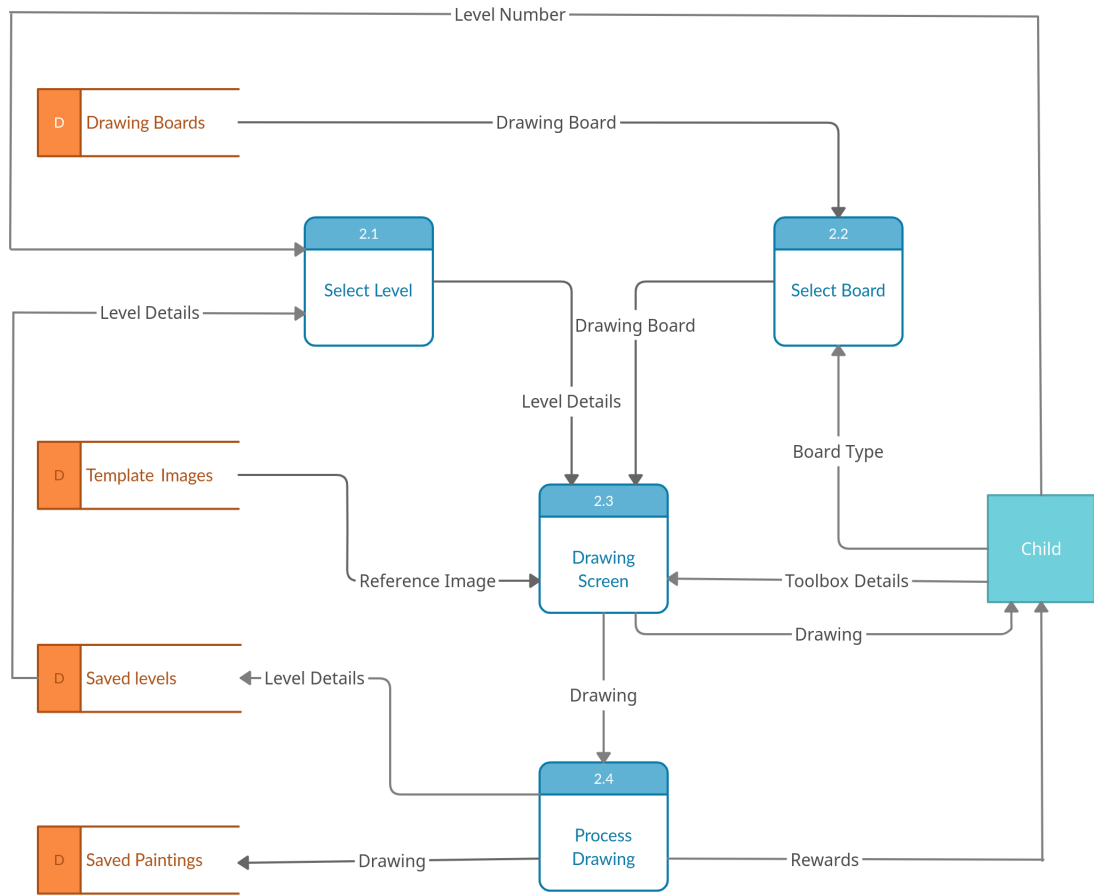
2.3.2 Level 2 Diagram for Play Game Module

Figure 2.4: Level 2 Play Game Mode DFD

- **Select Level:** User selects the level to play.
- **Select Board:** User selects the drawing board to draw on.
- **Drawing Screen:** Provide the user with a drawing screen that contains all utilities (Reference Image, Board, Tool Kit) using which a user can draw.
- **Process Drawing:** It processes the user's drawing and according to the percentage match, rewards are given.

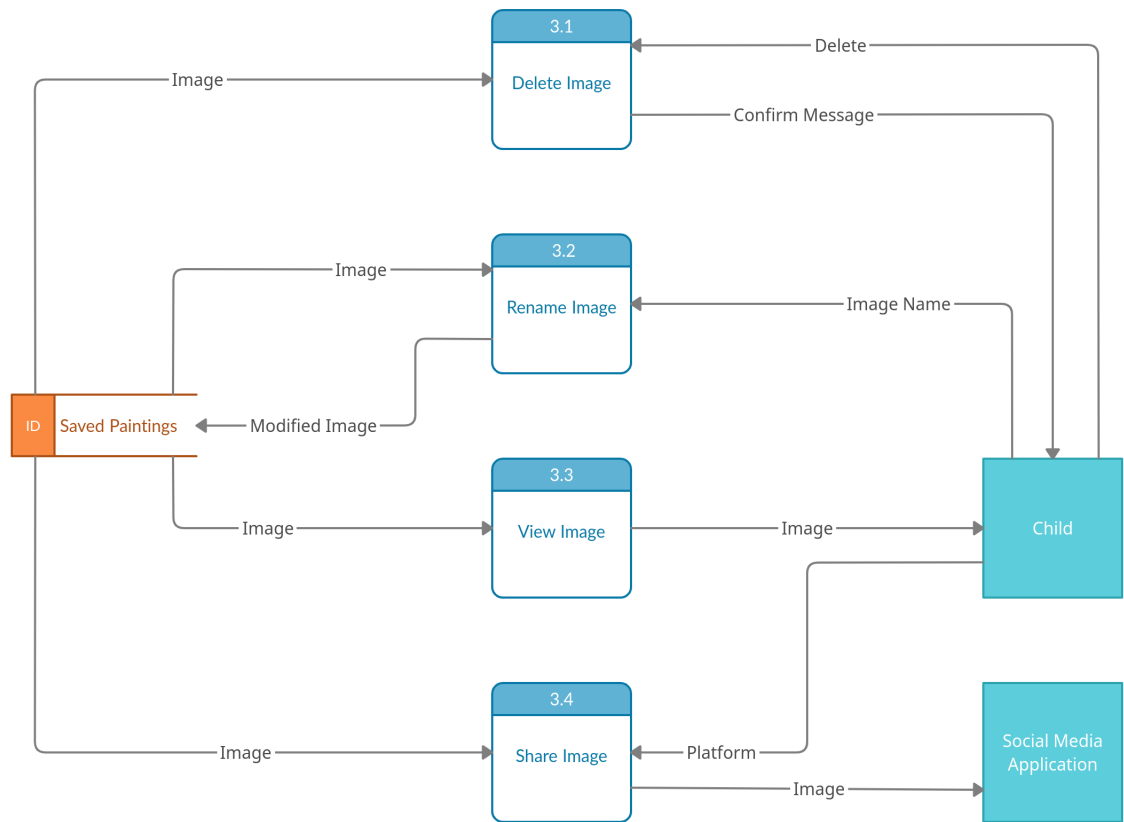### 2.3.3 Level 2 Diagram for View Gallery Module

Figure 2.5: Level 2 View Gallery Mode DFD

- **Delete Image:** Deletes an image or drawing.
- **Rename Image:** Rename the image or drawing file name.
- **View Image:** The user can view the saved image or drawing.
- **Share Image:** Share the image on social media platforms.
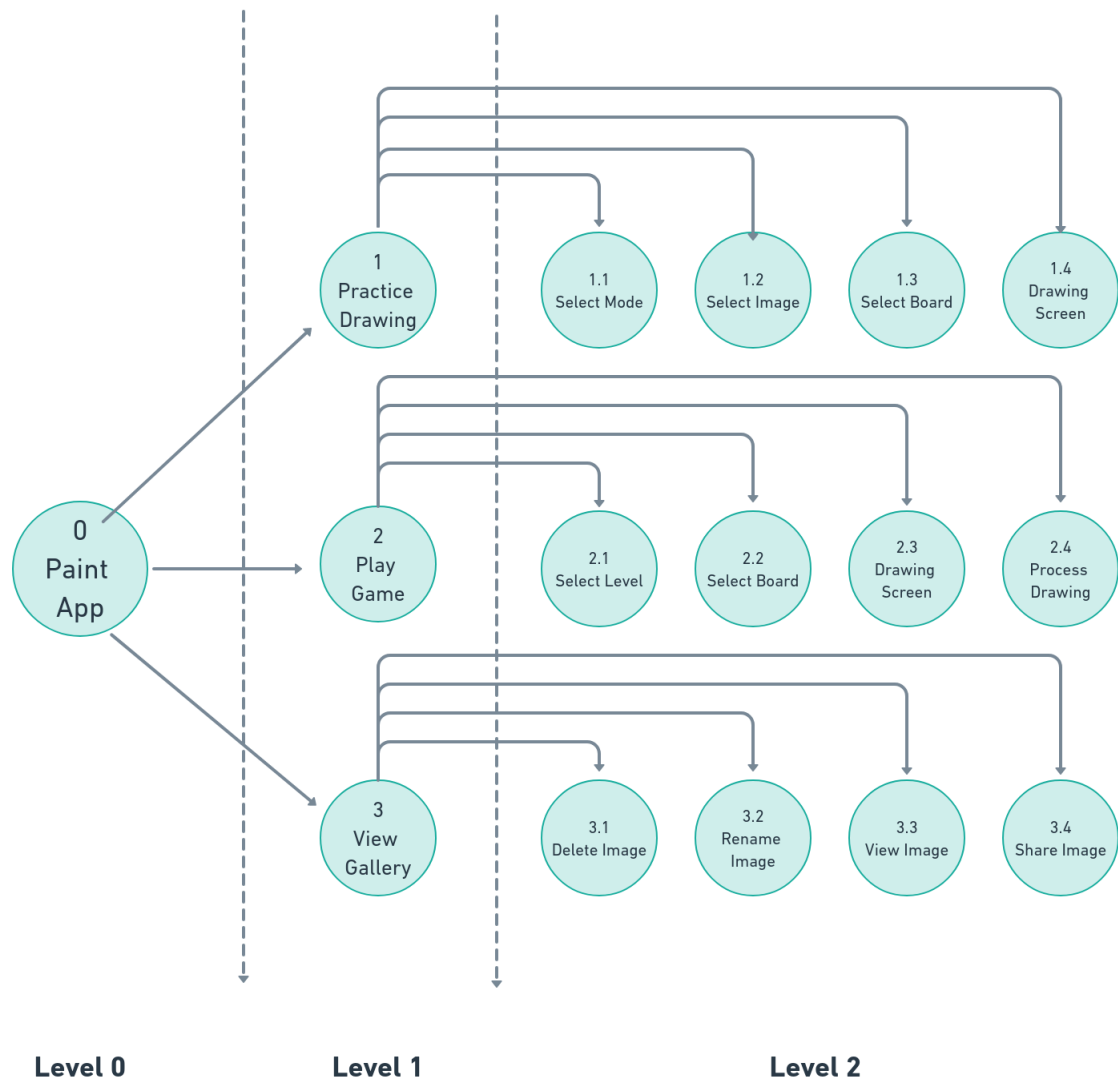
3 Process Decomposition Diagram

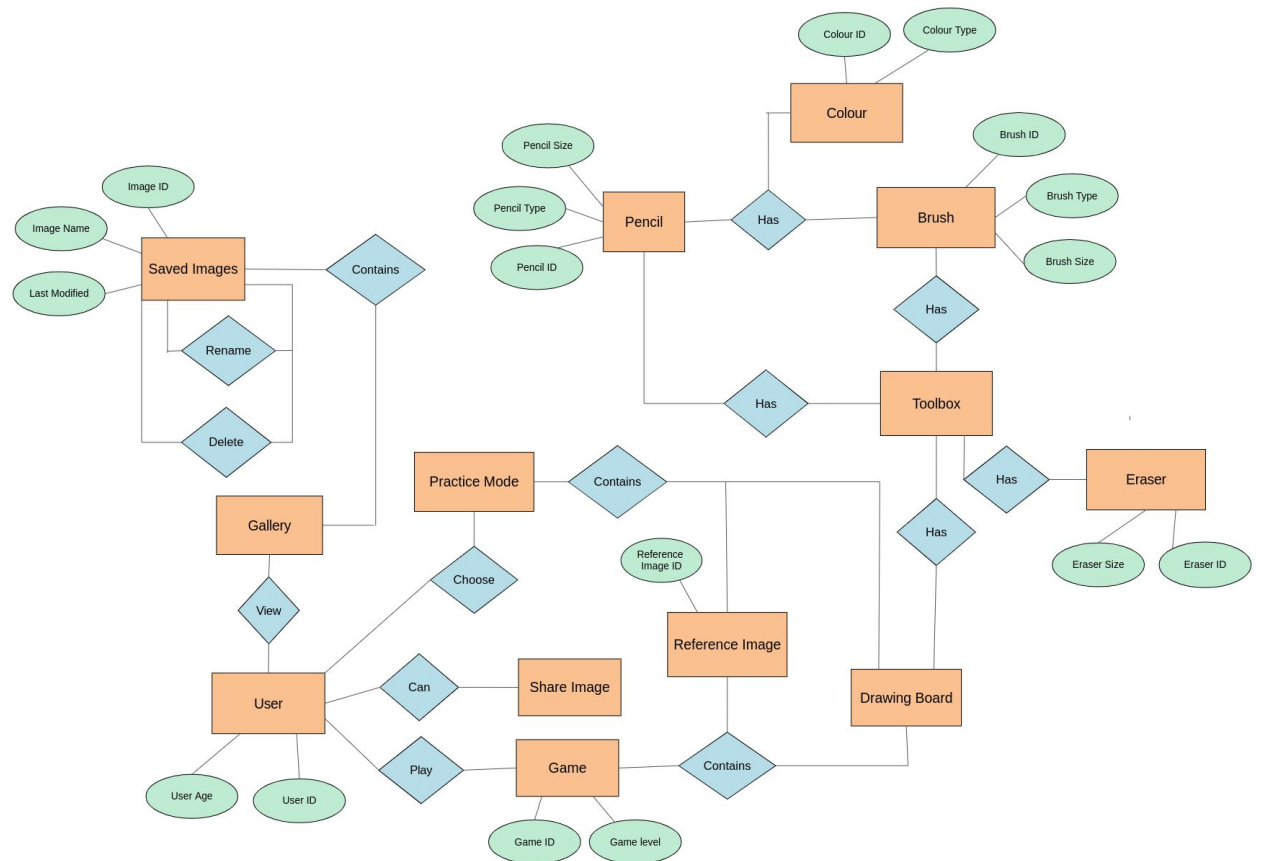Figure 3.1: Process Decomposition Diagram

4 Entity Relationship Diagram

Figure 4.1: ER Diagram

5 Data Dictionary

Data Object/External Entity	Type	Description
Level Number	Integer	Id of a specific level among different levels of the game.
Image Operations	[Delete, Rename, Share, View]	The different operations which can be applied to an image.
Toolbox Details	Pencil + Eraser + Brush	Contains different components like Pencil, Eraser, Brush.
Pencil	Pencil-id + Size + Type + Colour	A pencil is defined using it's id, size, type, colour..
Eraser	Eraser-id + Size	An eraser is defined using it's id, size.
Brush	Brush-id + Size + Type + Colour	A brush is defined using it's id, size, type, colour.
Colour	Colour-id + Type	A colour is defined using it's id and type.
Size	Integer	An integer representing how big or small an item is.
Pencil-id	Integer	An integer representing a specific pencil.
Eraser-id	Integer	An integer representing a specific eraser.
Brush-id	Integer	An integer representing a specific brush.
Colour-id	Integer	An integer representing a specific colour.
Type	String	String indicating the type of object.
Template Images	Image*	Contains the images to be used as a reference by the child.
Saved Paintings	Image*	Contains the images which were earlier drawn and saved by the child.
Drawing Boards	List of Board Type	Contains the available list of boards to be chosen by the child.
Board Type	String	The type of board selected by the child.

Data Object/External Entity	Type	Description
Saved Levels	Level Details*	Contains all the level-ids and its detail completed by the child.
Level Details	Level-id + Rewards	Contains level-id of the level, rewards gained on completing that level.
Level-id	Integer	An integer representing a particular level of game.
Rewards	Integer	Represents the points (out of 10) gained in completing a level.
Reference Image	Image	Image to be used as a reference while drawing by the child.
Modified Image	Image	Changed image after applying image operation on the image.
Delete	Image + Confirm Message	Option to delete the image with confirm message.
Rename	Image + Image Name	Option to change the image name.
View	Image	Option to view the image.
Share	Image + Platform	Option to share the image on some platforms.
Image	[JPG, PNG]	The image can be of some specific format.
Confirm Message	[Yes, No]	Confirmation message for the operation being performed.
Image Name	String	Name of the image being involved.
Platform	[Facebook, WhatsApp, Instagram]	Platform used while sharing the image.
Image Practicing Mode	Mode Type	A mode used for practicing the drawing by the child.
Mode Type	[Image Practicing Mode, Freestyle Mode]	Represents the chosen mode by the child.