



Lancaster
University

D3: Team Presentation & Demo

Group 61, Module 210, BSc Computer
Science, Lancaster University.

Overview

The Application in Summary

Code Architecture

Implementation Process

User Evaluation

Reflection

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Overview



- Our group decided to create a painting application that we believe could support main functions similar to those found in MS paint.
- The main libraries that we used for this project were Graphics2D and Swing
- Our belief as a group was that our program should support a few main functions and tools such as pencil, paintbrush, rubber as well as some other functions as you will see later.



The application in summary



Pencil tool

Brush tool

Text tool

Eraser tool

Rectangle tool

Oval tool

Line tool

Paint bucket tool

Select tool

Smart colour picker

Dynamic tool options

Transparency

Multi-layers

File menu:

- New
- Open
- Open last image
- Save
- Save as...
- Toggle dark mode

Edit menu:

- Undo
- Redo
- Fill
- Clear

Help menu:

- About program
- Toggle narrator mode

Move layers

Rename layers

Group 61 //



Code architecture

We have implemented our classes with object-oriented programming in mind, with a focus on extensibility and limiting reused code. We mainly extend on Graphics2D for our application, but also use external libraries like FlatLaf to aid with certain functions such as dark mode.

- Our Canvas class is our most important, managing the entire multi-layered canvas and providing standard functions for other classes to use to interact with it with minimal errors. We utilise Graphics2D in a way that can safely and accurately ensure that drawing on a specific layer is controlled.
- Our AbstractTool class provides a standard way for our team to implement and use tools in our program. The tools have a name, a dynamic panel, a way to use them, and can play a sound. All of our tools are an extension of this class.
- Our UserInterface class manages the entire UI of the program, and listens for actions such as button presses to initiate different things like tool usage. Thanks to the AbstractTool class, the code to draw with tools is kept very minimal.
- We also have classes to manage important other windows, like NewDialog, OpenDialog, SaveDialog and our Colour Picker. These classes open a new window that allow the user to interact with them and do different actions



Implementation process



1. Our project can be split into 3 different phases those being planning, production and evaluation.
2. During the planning phase we tried to make sure that every group member would know how to contribute to the group and we stressed on the order and timings of different tasks that we would undertake.
3. During the Production phase we allowed each group member to take different tasks as well as pushing different issues that they encountered. The main issue that we encountered was when multiple people wanted to do the same task.
4. During the evaluation phase of our project we tested our application on multiple people outside our group and used the feedback to try and improve on our current application. A main problem here would have been time management.

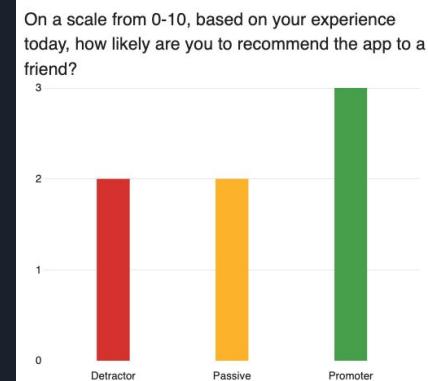
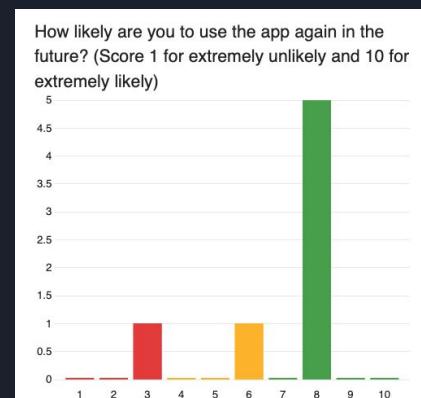


User Evaluation - Demo & Qualtrics Survey

The user evaluation was conducted through a self-guided demo of the programme by a selection of users who provided feedback through a Qualtrics survey (appendix 1)

All ethical considerations were agreed beforehand and details provided to the users ahead of gaining consent and providing the programme code.

- All participants were familiar with at least one other ‘painting app’ with MS Paint being noted by all - most knew multiple apps
- All participants were able to complete their task with very little difficulty
- Mean usability stats across 5 metrics were 8.4/10 - Navigation // Layout // Font Size // Font Style and legibility // Colour





Feedback from User Evaluation

What was your favorite thing about the app?

What was your favorite thing about the app?

I liked being able to open images

Being able to change the colour of the paint brush

I really liked the ability to undo and redo, especially with the shortcuts

The audio support was really helpful. The toolbar was also really easy to access.

Simple to use

I loved the smooth drawing experience

the narrator mode

What was your least favorite thing about the app?

What was your least favorite thing about the app?

I dont like the fact that the eraser draws white on the background

Not being able to see shapes when dragged

I didn't like the fact that when I tried clearing the page it didn't clear all the layers

Nothing

the select tool and fill bucket not working properly

the layering being limited and preset

the select tool

Following the feedback from the survey we made the following amends to the project:

1. After receiving feedback from the survey we decided to change how the eraser tool works. Initially, we had a few ideas around getting the background colour and drawing with that. However, after consideration we decided that a better change would be to draw with transparency. We have since updated the tool.



Reflection on the project



O1

The overall UI of our project is very clean and neat. The background can be dark or bright. We have 9 tools and layer Settings to do most of the painting needs. We can also change the size of the canvas and fill the background color at will.

O2

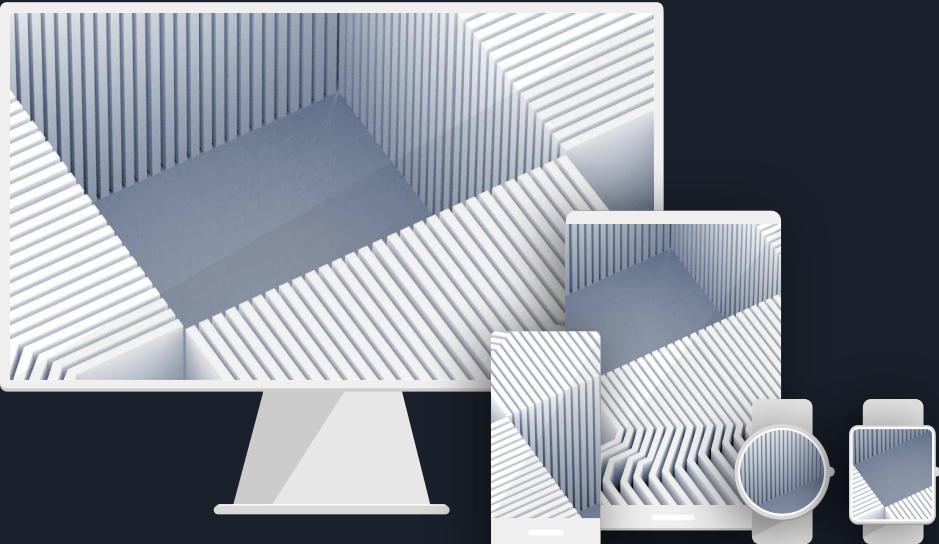
We found some bugs and some Code incompatibility during testing, such as the selection of brush color affecting the background fill color. We rewrote the code to ensure compatibility, so that the whole project can run more perfectly and smoothly.

O3

It was enjoyable to do a project as a team. It took 18 weeks from the design report at the very beginning to the code submission. During this period, team members actively communicated with each other and worked hard to complete the targets, so we could feel a sense of accomplishment at the end. In addition, we expanded our thinking and improved our ability to write code, which we may use to help us do better works in the future. In general, this project not only improved our skills, but also helped us gain experience in working as a group. It was a very meaningful learning process.



Thank you!





Appendix 1 - Survey Questions PDF

