

## PaintDotOrg Requirements

- I. Summary- Paint dot org is an application which will allow users to make art pieces and edit photos on their computers. The user will start off with only two functions, the ability to draw lines and save their art piece, but they will also be able to purchase additional functionality such as changing colors, making shapes, and using different drawing tools. The application should be able to handle credit card transactions in a secure manner to allow the customers to comfortably purchase extra functionalities.
- II. Product Functions
  - A. This program will be an art focused program, with the user being able to make art by using the mouse as a virtual art tool by clicking and dragging the mouse. This enables the user to start drawing with pixels chosen by the users desired size and color. By releasing the mouse button, the virtual art tool will stop drawing until you click again. Along with this, there will be other features available for purchase. Some features include being able to select various images to paste into their canvas, being able to enter text by selecting the specific function, and other fun exciting features!
    1. Any keyboard and mouse can control the program, with the mouse controlling the art tool and the keyboard taking over other functionalities such as selecting tools on a key press or shortcuts to functions such as undo or zooming in.
    2. Functions should include:
      - a) Selecting an image - Choosing an image with the mouse for further changes.
      - b) Rotating an image - Changing the image's orientation by spinning it around its center point.
      - c) Drawing basic shapes - The ability to create basic shapes such as circles, squares, triangles, and rectangles.
      - d) Changing line thickness - Making the lines which can be drawn larger or smaller.
      - e) Changing color - The ability to adjust the color which is left by the drawing tools such as the pencil.
      - f) Changing fill color - Changes the color to fill shapes or objects drawn from multiple lines.

- g) Adding text - The ability to add text to the image in a variety of fonts.
- h) Erasing - able to select a tool exactly like your drawing tool but instead it removes what you created. Different sizes are selectable for those big mess ups!
- i) New Project: Creation of a new project.
- j) Open: Loads an existing project or a file of one of the supported image formats.
- k) Open Recent: Loads one of the displayed, recently opened files.
- l) Close Project: Closes the currently open project.
- m) Properties: Displays some properties of the project (such as the title) which can be edited.
- n) Save: Saves the project without changing its name or directory.
- o) Save as: Saves the project and gives the user the ability to change its name or directory.
- p) Export: Saves the current project to the selected file location in one of the supported file formats (PNG, JPG, BMP, GIF.)
- q) Exit: Paint dot org shuts down.
- r) Import Image: User can choose/import an image from a chosen file location (PNG, JPG, BMP, or GIF) into the drawing area that is draggable.
- s) Select: User can move previously drawn shapes and imported images around the screen.

3. Functions locked behind paywalls will be signified by a grayscale overlay with a "lock" emblem. Mousing over these locked functions will reveal the price for said function. Clicking a locked function will open a small window asking for the user to input his/her own payment information to unlock the selected function.

B. This program will allow the user to purchase more features through single transactions or package deals.

1. Major credit cards that will be accepted: Visa, MasterCard, American Express, Diner's Club.

- a) Requires credit card number, expiration date, and security code. User is notified if the transaction goes through

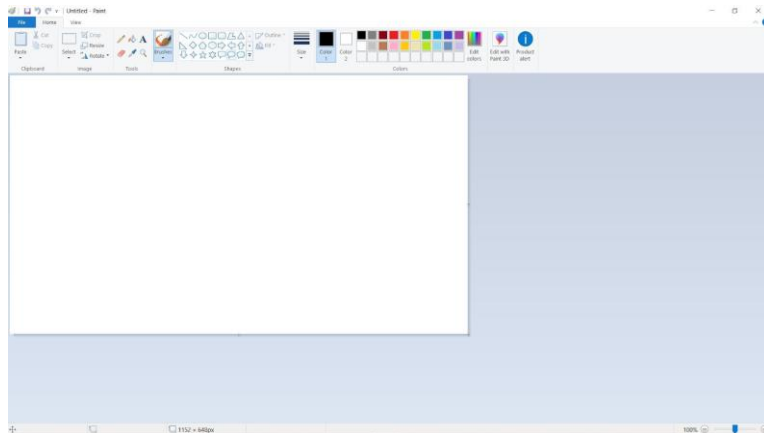
successfully. If the purchase is unsuccessful or the servers are not accessible, the transaction is cancelled and the user is notified of the issue.

2. The program will perform these transactions securely.

### III. External Interfaces

A. The interface should be simple, showing the current project which the user is working on along with a toolbar containing the different tools which the user has paid for.

1. In the top of the program is a toolbar containing various functions and tools for the user (example: colors, drawing functions, mouse controls, brush sizes, etc.)
2. Below the toolbar is the screen for the user to draw in. There should be a canvas that the user draw on and resize after purchasing the “resize” feature. The user can zoom in/out of the canvas. The selected tool should not function outside of the canvas. In other words, if the user attempts to use a tool outside of the canvas and into the background, the tool should turn inactive until the user returns to the canvas.
3. An example of the intended interface from a completely unrelated application:



### IV. Product Features

#### A. Basic Digital Art Tools

1. Begin with pencil tool to draw lines, the ability to save current work, and closing the program. Additional features will be unlocked via microtransactions and will be indicated as such if the mouse touches a locked tool in the menu.

#### B. Microtransactions

1. Adding to your functionality of different colors and utensils and other unique features only found at paint dot org.

C. Features available for purchase

1. Functions found in II.A.2., except for selecting an image, drawing with only one tool and color, and opening and closing programs, are all purchasable via microtransactions.

D. Variations of Expression

1. You have a multitude of different utensils and colors to choose from. Unlocked through purchases.

V. Specifically Non-Functional Requirements

A. Performance

1. Compatible with a multitude of different hardware manufacturers and operating systems.
2. Resizable Window.
3. Should run on Windows 7 and above.
  - a) Cannot run on Linux or MacOS systems.

B. Security

1. Credit cards or debit cards entered must pass the Luhn Algorithm.
  - a) This algorithm will check to see if the user entered has entered a valid debit or credit card.
  - b) Protects against fraudulent cards or accidental errors when typing in the card information.
2. Payment information will not be saved to prevent data breaches and card information from being accessed by hackers.
  - a) User must enter in his or her card information each time they wish to make a purchase

C. Tool Requirements and Descriptions

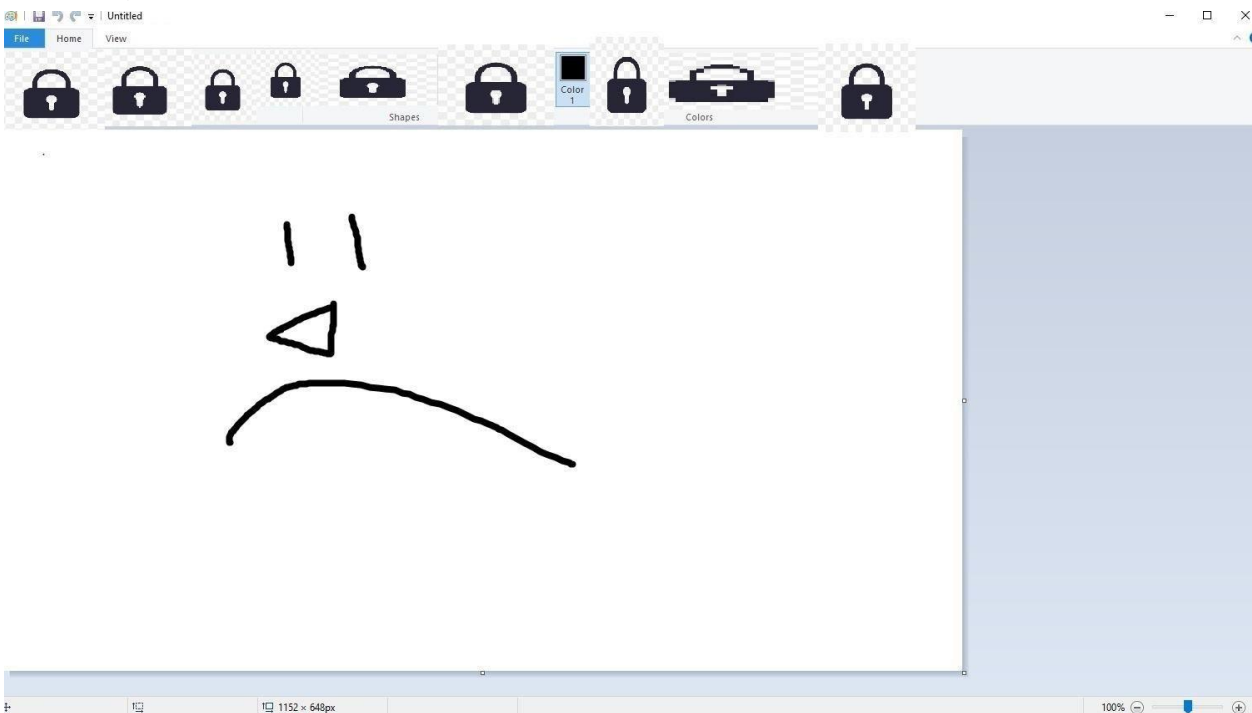
1. Functions that involve transforming images should do so via setting the mouse as an anchor point.
2. Selecting an image requires the user to click on the screen and drag the mouse around to create a rectangle that envelops the wanted image. Images can only be rotated and transformed once the user has selected an image. The user can select a rotation tool and click on the image to rotate the image, the degrees for the image's rotation depending on how the user rotates the image.
3. Drawing basic shapes - The user clicks a point on the screen, setting an anchor point. Holding the clicked mouse, the user can drag the mouse around the screen to expand the dimensions of the

shape about to be created. Upon releasing the mouse, the shape is created.

4. Line thickness - The user can choose one of four differing sizes for drawing tools, ranging from "Very Thin" to "Very Thick". The amount of pixels used in the drawing tool decreases or increases accordingly ("Very Thick" setting = significant amount of pixels).
5. Color and Fill Color - After purchasing the color feature, the user can select from a color wheel the color they wish to color with. The user draws in the color of whatever color they selected. Any areas filled in the with the Fill tool, restricted by any closed space of pixels the tool is selected in, are also colored in with the selected color.
6. Adding Text - The user can click on the canvas and begin typing text into a textbox. After purchasing the function, the user can select various fonts. The color of the text should also change depending on the color selected.
7. Erasing - The eraser tool resets any area the user mouses over to the default color of the canvas. Erasing can affect images, drawings, text, and anything visible on the canvas.
8. New Project - The user starts a new paint dot org tab with a blank canvas with default dimensions and all colors and settings are set to the default.
9. Open - The user can select any saved project and resume from when they last saved the project.
10. Open Recent - The user is given a list of the latest several projects the user has opened within the last week. The latest project is displayed at the top of the list while the oldest project is at the bottom.
11. Close Project - The user is asked if they wish to save their work before closing. Closing the project closes the paint dot org tab. If there are no other paint dot org tabs open, the program closes.
12. Properties - A small button in the toolbar that reveals several bits of information on the project. This includes the name of the project, the date of creation and when it was last edited, and the canvas dimensions.
13. Save - Quickly saves the project and all the work done to it. If the project has not been saved yet, the Save As function starts instead.

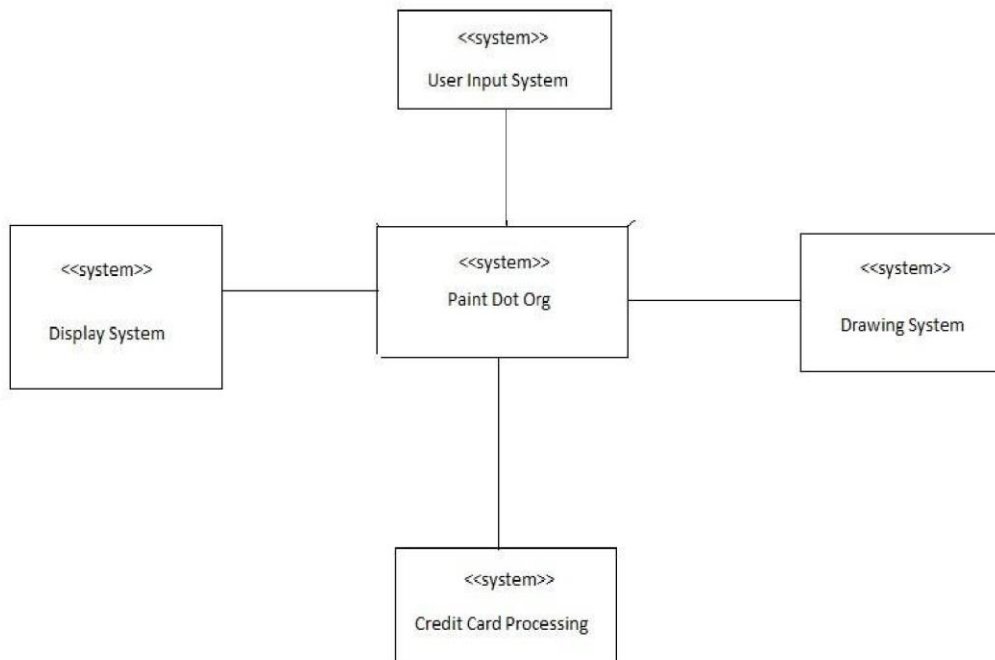
14. Save As - The user chooses the name of the project as well as the directory to store the project file. All progress on the project is saved.
15. Export - Creates a picture file of the project that can be submitted over the internet and displayed in photo applications on the operating system. Available picture file names include .JPG, .PNG, .BMP, and .GIF.
16. Exit - The paint dot org application closes down. The application asks for the user to save any unfinished work before closing, but the user can ignore this if he/she wishes.
17. Import Image - the user can insert an image from a chosen file location into the drawing area that is draggable.
18. Select - Allows user to move previously drawn shapes and imported images around the drawing area

## VI. Organizational and Other Requirements

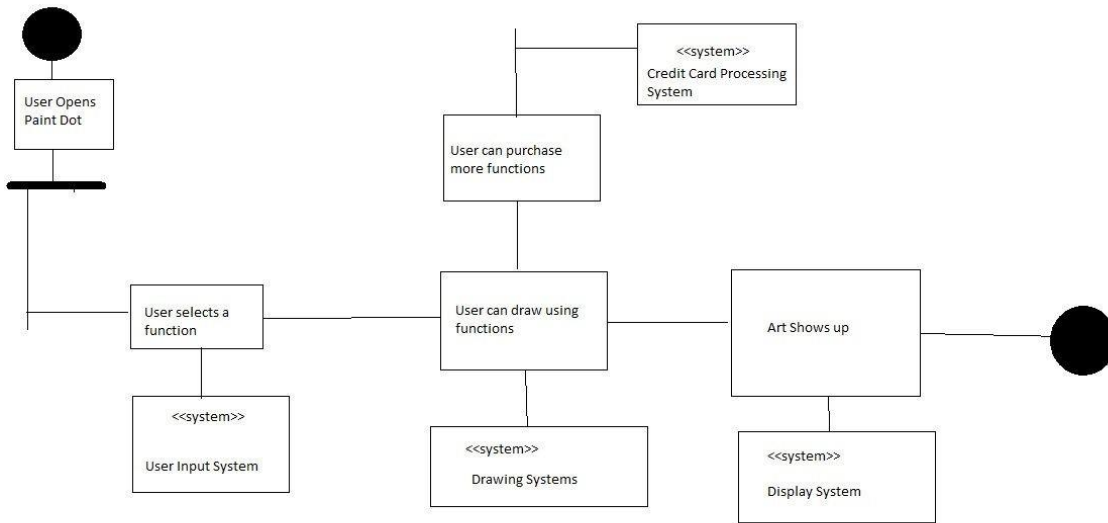


A diagram of the intended look for the application without any features unlocked.

## Context Diagram:

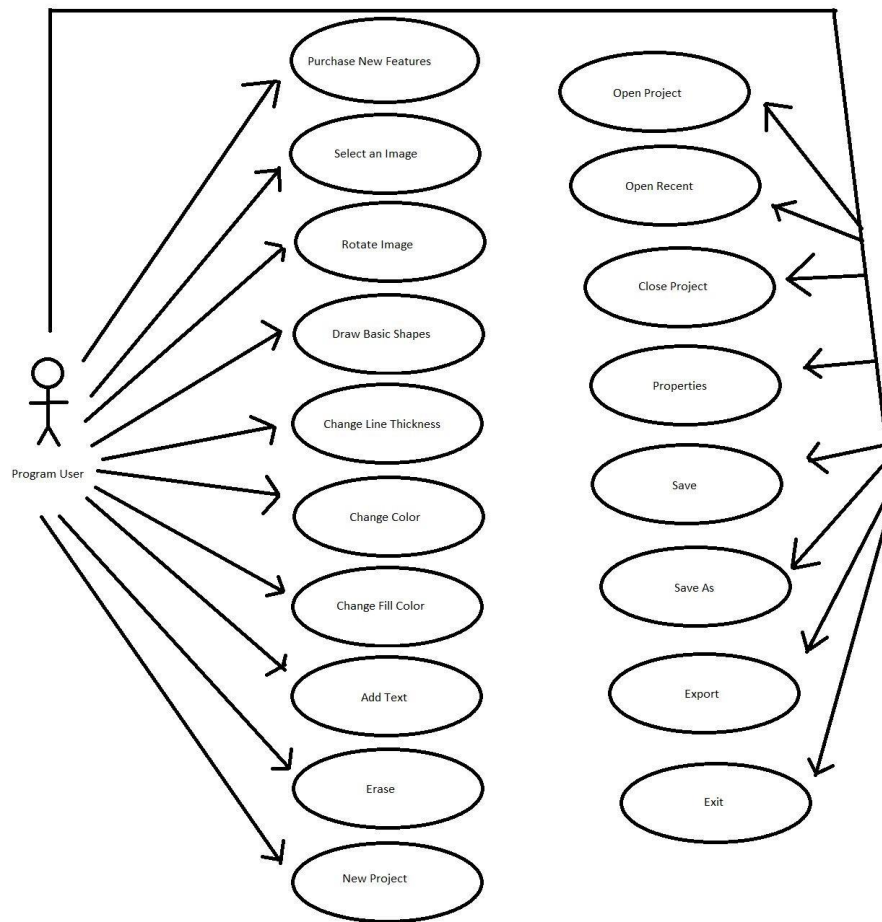


## Process Diagram:





## Use Case Diagram:



## Layered Architecture:

