

Pre-Production Documentation

FIT3157 - Assignment 2

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Project Analysis

Overview of the Project Requirements

Since there is a trend to offer an interactive experience to visitors in art galleries and museums, we have been asked to create a web-based app for a specific art gallery. The kiosk app should provide an informative and memorable experience for visitors. This app will be designed to help children to create digital artworks that are in style of the artist, Joseph Mallord William Turner.

Required Features for the Kiosk App

The touch screen app must be built by HTML5 canvas and JavaScript technique, and perfectly compatible with Google Chrome, it should provide brush tools with selectable brush size and colour palette with predefined colours which are appropriate for the artist's style, and the function to clear canvas manually or automatically after certain amount of time that are in active.

Website's Target Demographic

The target demographic is children (ages 5 and up) who like to draw and are interested in Art. As this is a touch-screen app, the target audience would include children who have access to a touch-screen tablet device. By using the app, children can mimic the style of JWM Turner more effectively, by simply selecting a few tools and colours. By using these features, they can draw pictures in Turner's style, very easily.

Here is an example of user persona who would use this app:

Persona:	Primary school student
Fictional name:	Melanie Raffertson
Job title/major responsibilities:	<ul style="list-style-type: none">• Grade 4 student at primary school
Demographic:	<ul style="list-style-type: none">• 9-year-old, female• Is part of a family 4, has siblings• Loves Art and drawing: favourite subject in school is Art

Goals and Tasks:	<ul style="list-style-type: none"> • Wants to learn more about artists in history • Wants to learn how to draw like her favourite artists to improve her drawing ability
Environment:	Competent in using tablet devices, as her family has a iPad at home and she regularly uses various drawing apps.
Quote:	"I want to draw like my favourite artist!"

Visual Design Research

Overview of J. M. W. Turner (1775-1851)

Joseph Mallord William Turner was born in 1775 in London, England. His father encouraged his artistic talents and displayed his artwork in his shop. He attended art school and painted scenery to fund his academic endeavours. He painted landscapes, antiquarian topography and watercolour paintings in particular.

Key Visual aspects of Turner's work

Turner likes to paint shipwrecks or fire events which he saw first hand into series of watercolour paintings, and the natural phenomena such as sunshine, storm, he also has huge interest on marine paintings, which can be seen in Dawn after the Wreck and The Slave Ship.

Turner demonstrates the huge power of nature on destroying in his painting, by using watercolor sketch technique on oil paints, to emphasize the lightness, fluency and other effects.

In his later year he draw the oil paints more transparently, for example in the Rain, Steam and Speed - The Great Western Railway, where the objects are hardly recognizable.

Images of other designs that have influenced your prototype



Joseph Mallord William Turner
View in the Avon Gorge 1791

We learnt color combination for the drawing app from this paint, even turner's style changed huge between his early paint and lately paint, but he's fascinated about sea has not changed, therefore we must have the color blue and white in the palette.



Joseph Mallord William Turner
Fishermen at Sea exhibited 1796

Turner's uses watercolour sketch technique on oil painting create lightness to the paint, therefore we decide to code a brush which can render the color on canvas to bring similar effects like using watercolor technique on oil paints.



Joseph Mallord William Turner
The Artist and his Admirers 1827

Turner's work starting being transparent, so we decide to add filter function to make the drawing looks transparent.



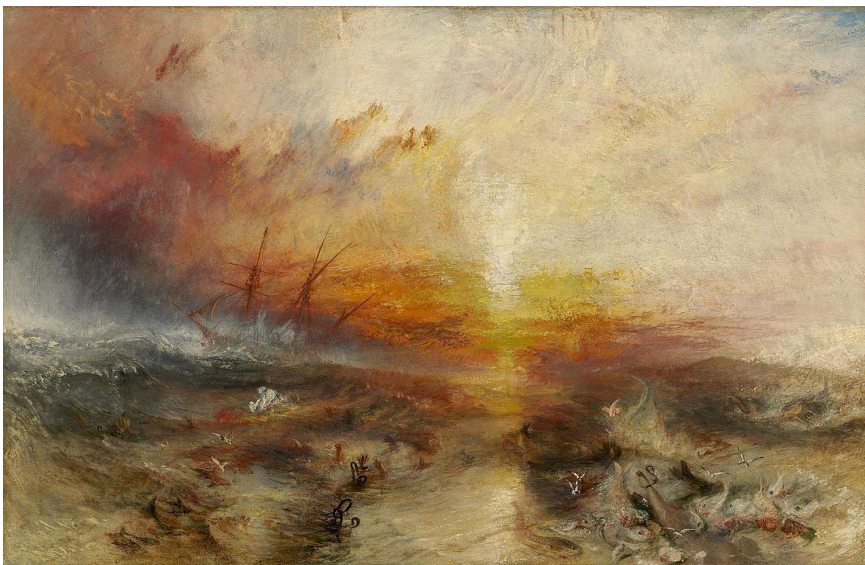
Joseph Mallord William Turner
The Dogano, San Giorgio, Citella, from the Steps of the Europa exhibited 1842

Turner likes to demonstrate natural phenomena, in this case we can see fog appear in the paint, which we can use a special brush to achieve.



Joseph Mallord William Turner
Dawn after the wreck - 1841

The destructive power of nature start to show up from this paint and the next one, and the color of the picture start being orange like dawn, where we can add a color similar to this one.



Joseph Mallord William Turner
The slave ship 1840

The destructive power of nature plays an important role in this picture, and there are details such as ship which are hard to draw by children, so we can set up a stamp function which can draw predefined picture such as a ship to the canvas by a simply click.



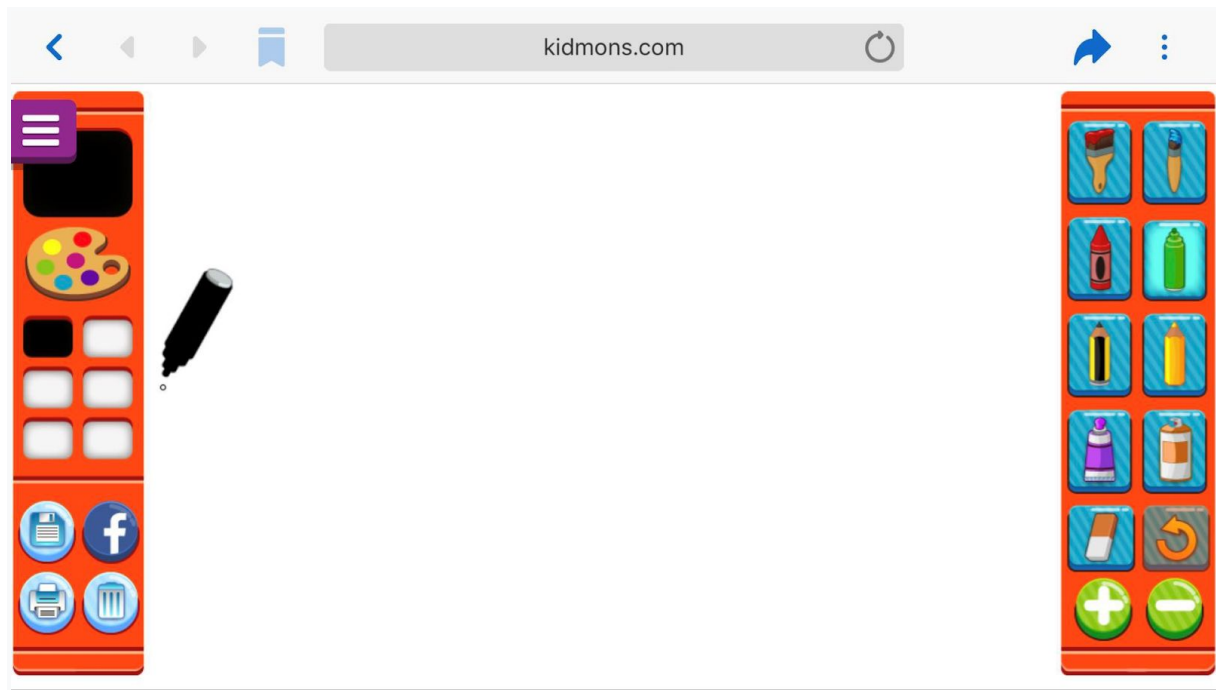
Joseph Mallord William Turner
Hannibal and his Army Crossing the Alps, 1812.

A huge area of shadow come up in this paint, so we add a black color to the color palette.



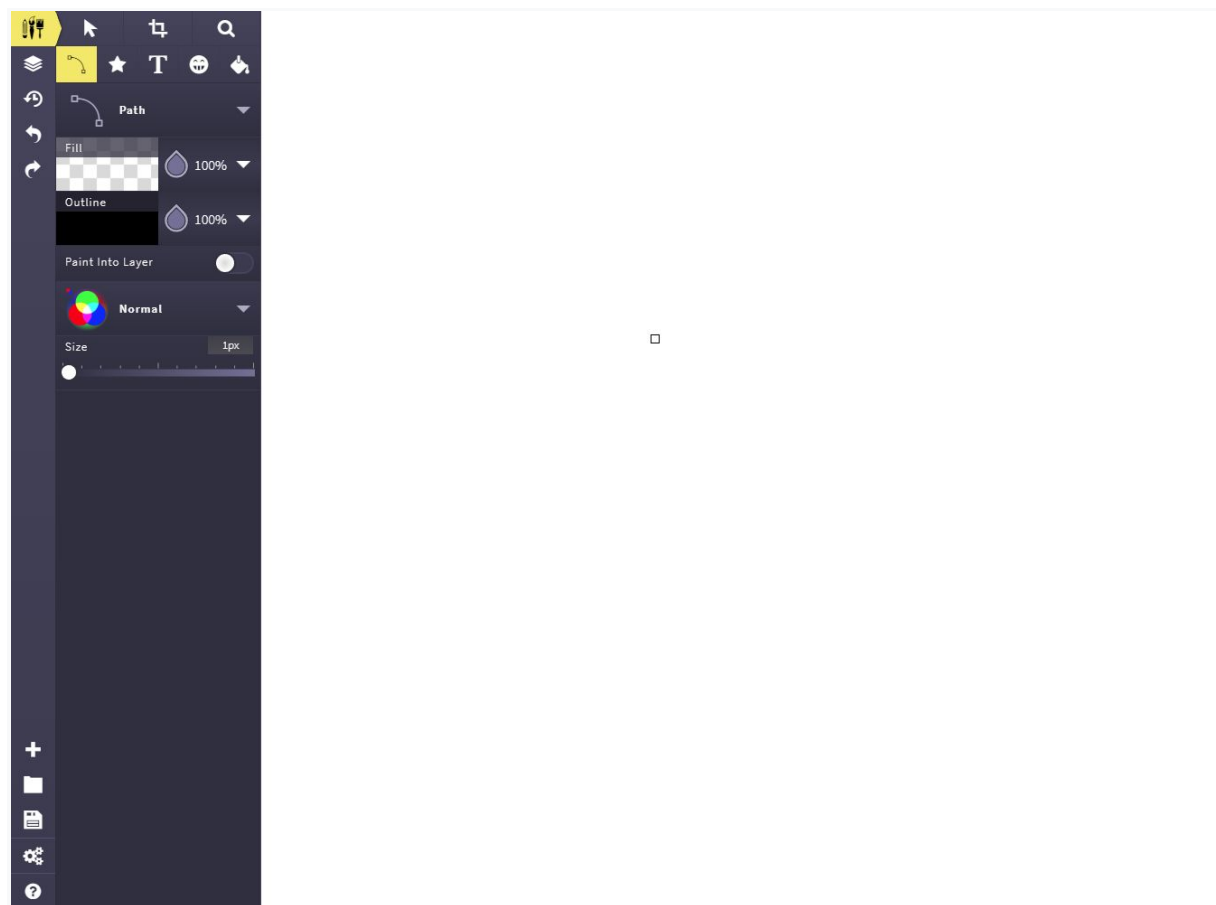
Joseph Mallord William Turner
Rain, Steam and Speed – The Great Western Railway

This is one of the late work of turner, where the objects are hardly recognisable, and it gives us another idea for a brush, by dragging the mouse, texture can be drawn on the canvas.



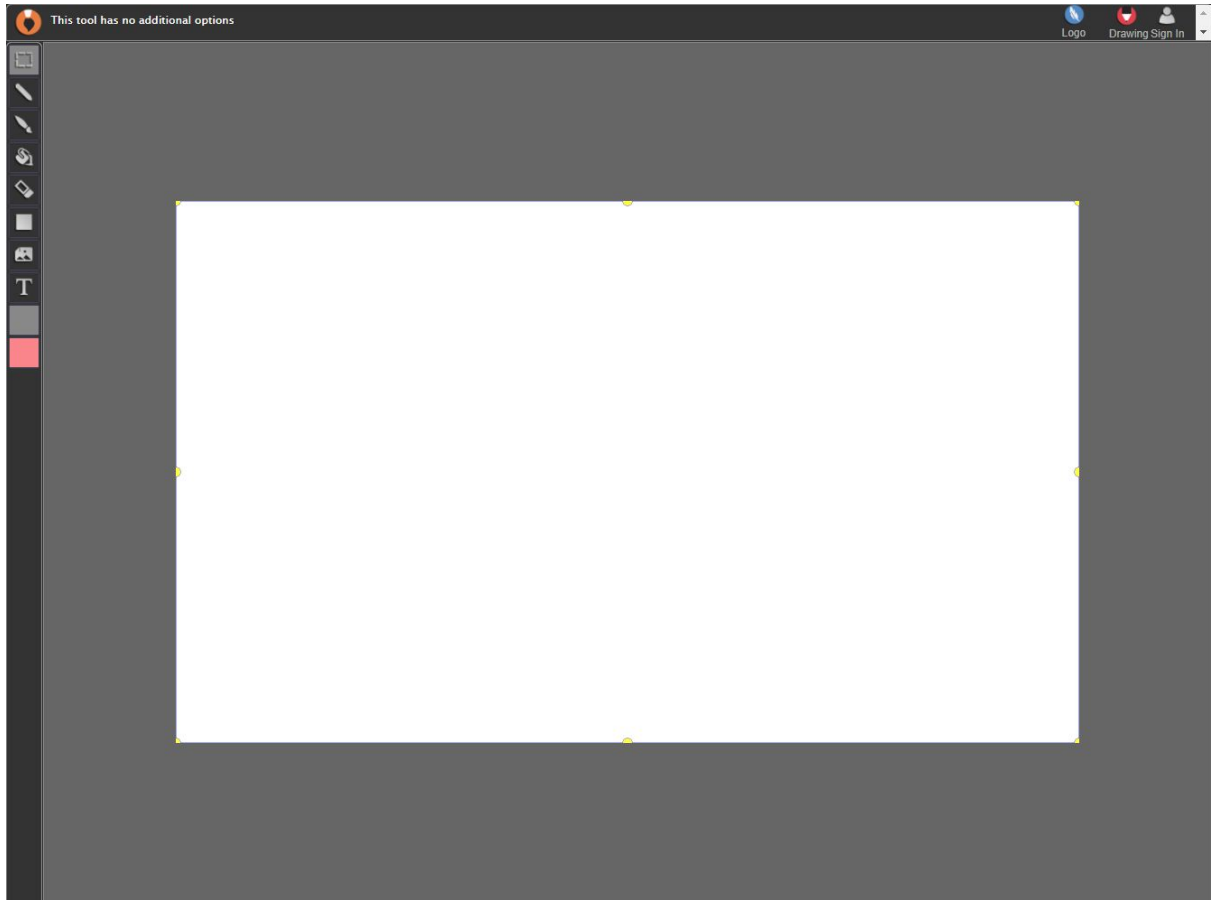
Kidmons.com

The program offers us idea about the user interface, and tools we can include in our own app. And the interesting function in this is the save function and the share to facebook.



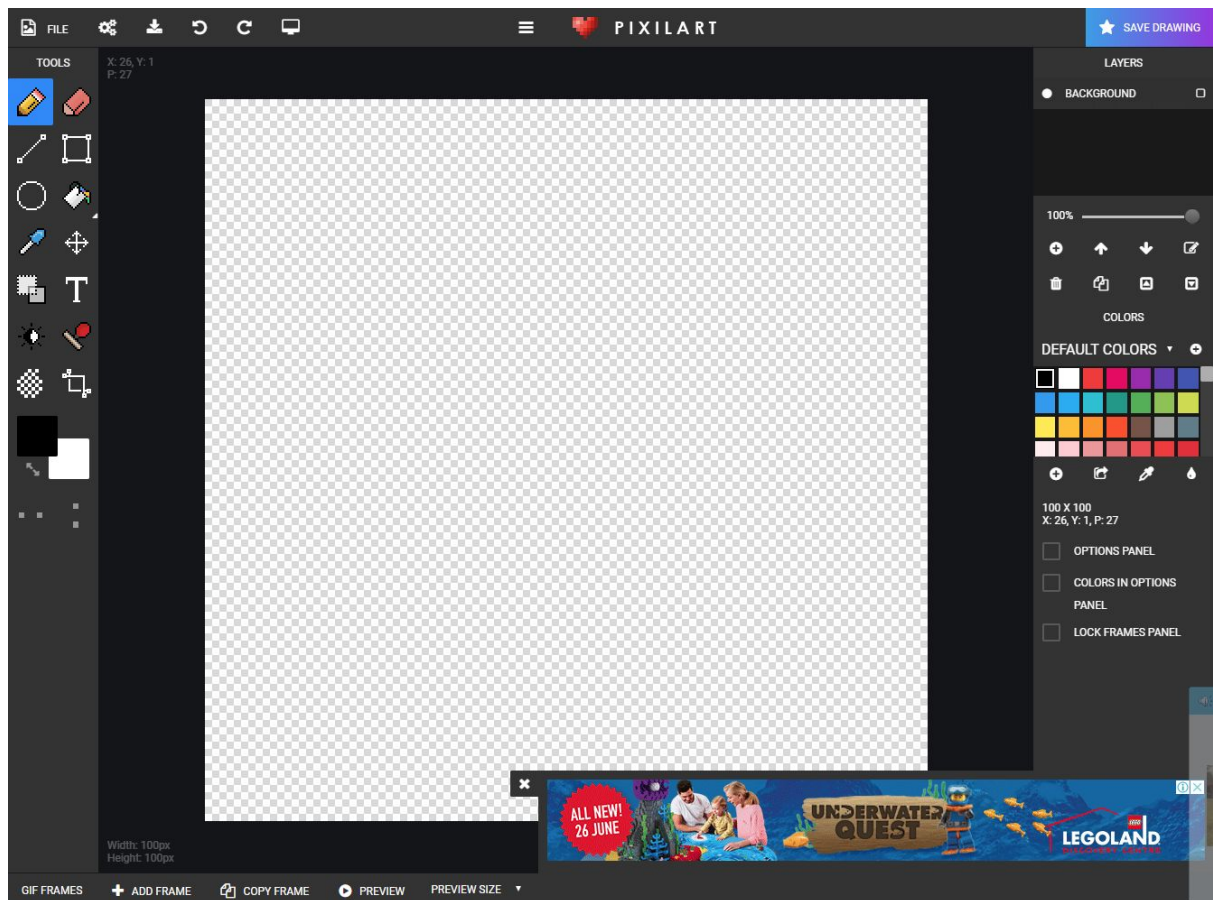
<https://sketch.io/sketchpad/>

This tool has beautiful UI design but hard to understand even for adult, since the app is designed for children, we decide to make the UI as simple as possible.



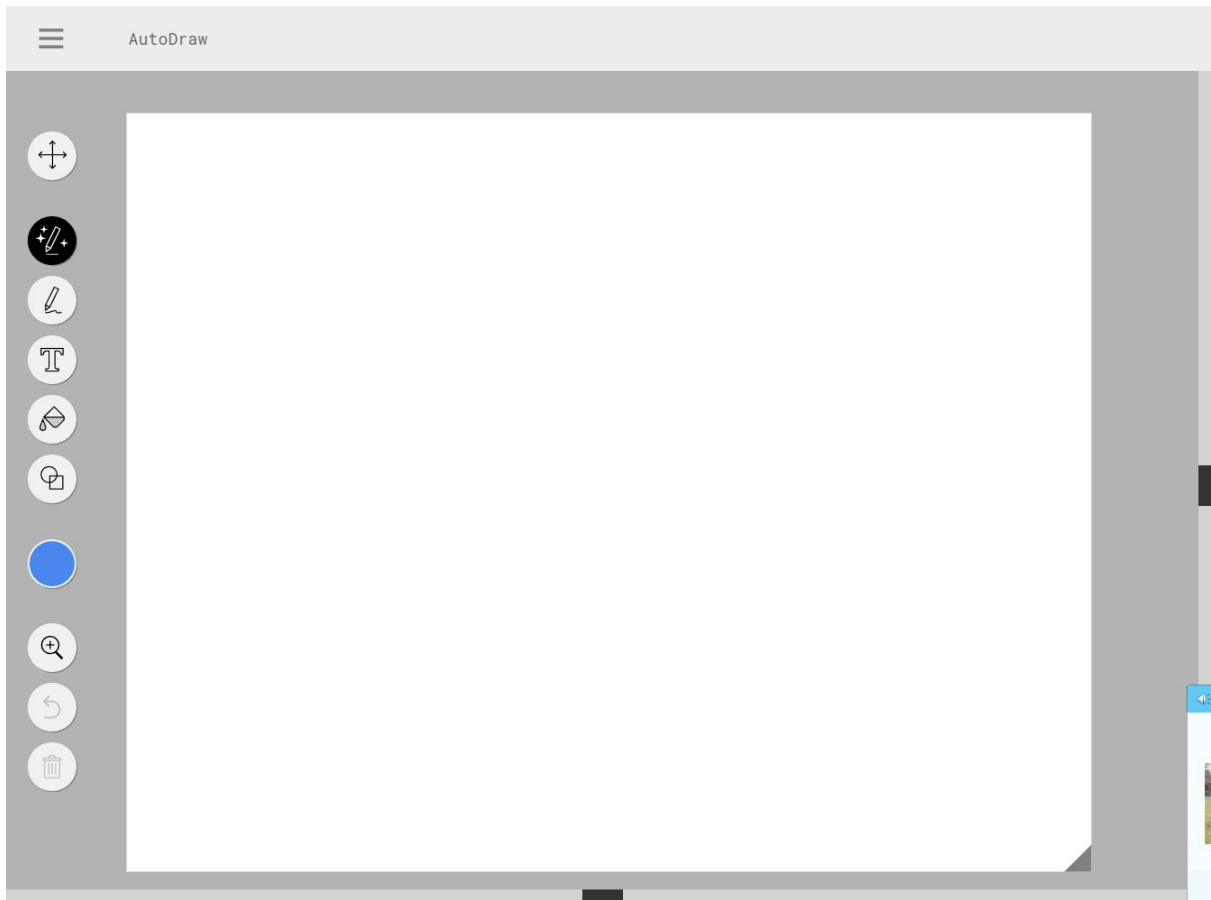
<https://www.youidraw.com/apps/painter/>

The UI is nice and clear but not colorful, children painting tool should be colorful, this help us to decide what kind of background we should use, and we chose a colourful one.



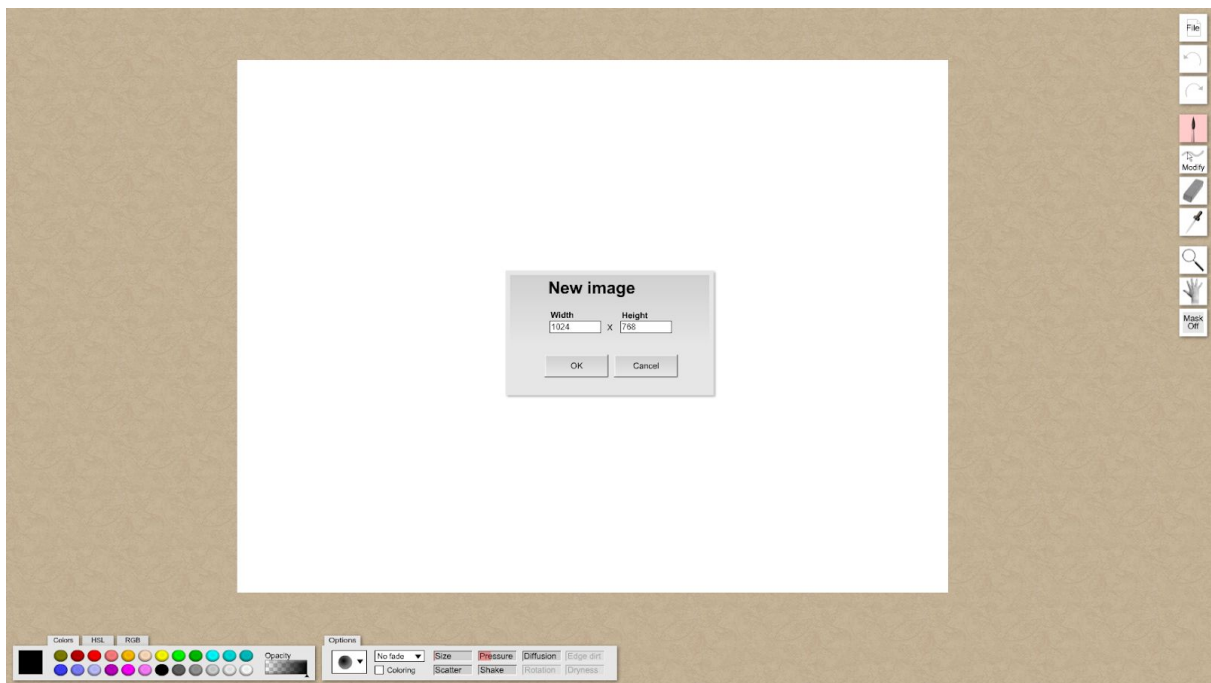
<https://www.pixilart.com/draw>

This is one of the best design we have found so far, canvas with grid can help user to measure the distance, and great layout is easy to understand, we learnt from the layout and the color palette.



<https://www.autodraw.com/>

This one has nice and easy layout, with tools on the left, and color can change by clicking on the button, and the zoom in can help user draw with details, we learnt these interesting functions from this.



<http://www.onemotion.com/flash/sketch-paint/>

Users can set the canvas size for this app, we really like this function and we may apply it to our app, depending on the technical research.



<http://kleki.com/>

This color palette is great, users can customise their own color by this, but it looks hard to code, so we may need a little more research on this one.

Technical Research

Minimum requirements

The touch screen app was built using HTML5 canvas, CSS and Javascript. It has been tested in Google Chrome and is compatible with this internet browser. The brush sizes, colour palette feature and 'clear canvas' button were adopted from Tutorial 7. The pre-defined colour palette was selected to feature Turner's most commonly used colours.

Clearing the canvas after 5 minutes

Since we already had the 'clearCanvas()' function implemented, all we needed to research was to find how to implement a timer using javascript. After googling "javascript timer" the first search result takes us to the W3C School's 'JavaScript Timing Events' page (https://www.w3schools.com/Js/js_timing.asp). The page told us that the following function:

```
setTimeout(function, milliseconds)
```

executes a function, after waiting a specified number of milliseconds.

This is exactly what we needed. We used the following code to implement our function.

```
window.setTimeout(idleClearCanvas, 300000)
```

Additional drawing tools

Brush-like effect

After many hours of researching 'how to create a brush-like tool in HTML5 and javascript', with little to no promising results, we came across this internet source that were able to adopt into our design: <http://perfectionkills.com/exploring-canvas-drawing-techniques/>.

The heading titled 'Edge smoothing with shadows' was particularly interesting to us because the code helped to achieve a 'brush-like' stroke to the canvas.



We adopted the following code, learnt from their approach and modified it to fit with our code structure.

```
var el = document.getElementById('c');
var ctx = el.getContext('2d');
var isDrawing;

el.onmousedown = function(e) {
  isDrawing = true;
  ctx.lineWidth = 10;
  ctx.lineJoin = ctx.lineCap = 'round';
  ctx.shadowBlur = 10;
  ctx.shadowColor = 'rgb(0, 0, 0)';
```

```

        ctx.moveTo(e.clientX, e.clientY);
    };
    el.onmousemove = function(e) {
        if (isDrawing) {
            ctx.lineTo(e.clientX, e.clientY);
            ctx.stroke();
        }
    };
    el.onmouseup = function() {
        isDrawing = false;
    };

```

Changing canvas background

We knew that changing the canvas background would involve changing the 'background-image' property in css but to learn how to implement this dynamically through the use of buttons, we did a google search for some javascript code. The W3C school's 'Style backgroundImage Property' page was useful to us.

(https://www.w3schools.com/jsref/prop_style_backgroundimage.asp)

We modified the following code to implement buttons that can be pressed to change the background of the canvas.

```
document.body.style.backgroundImage = "url('img_tree.png')";
```

Blur-effect

We knew that there were various CSS filters that we could use to help achieve that 'blurry' effect that Turner used when painting in watercolour. We visited the following website to help us implement this feature: <https://css-tricks.com/almanac/properties/f/filter/>.

Stamp function

After hours of research, I found that by set up var image with a provided line, and use the onload to check image onload,

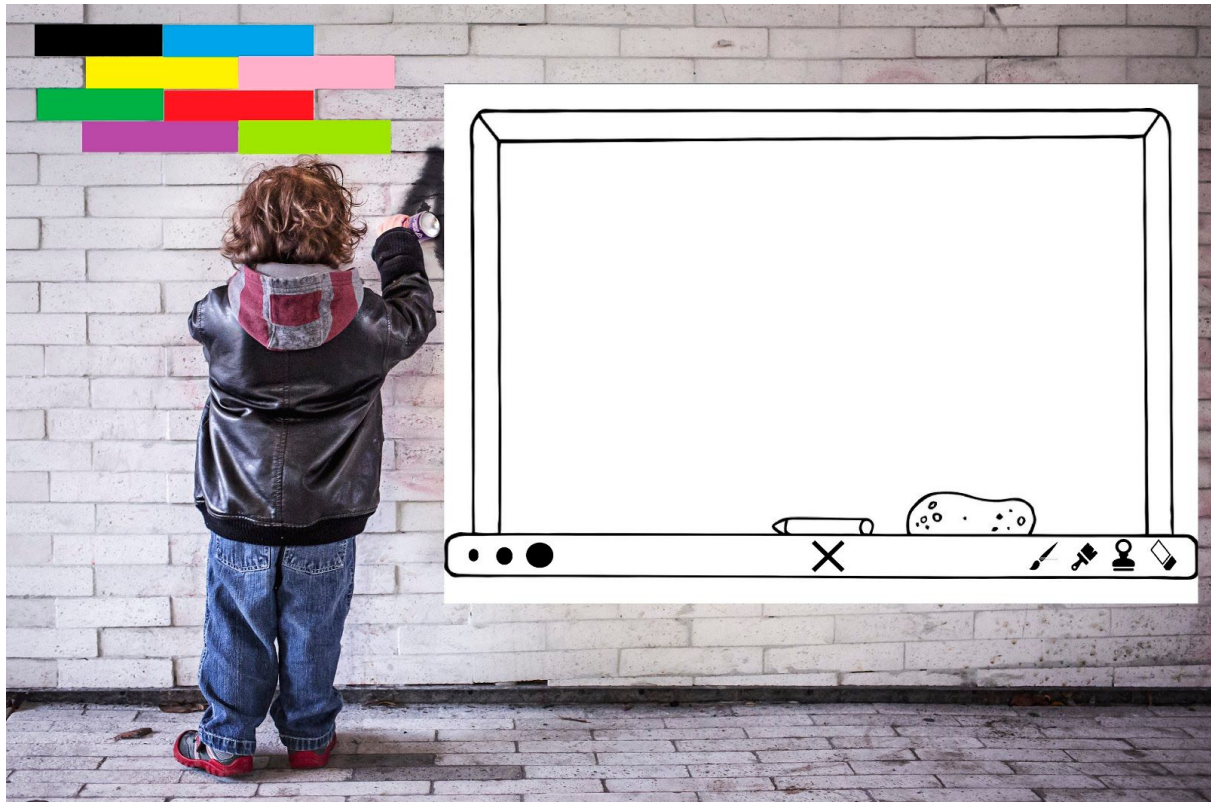
```
shipimg.onload = function() {}
```

Then to use context.drawImage to print the image on canvas, however this is not compatible with other function in app for some reason, for example it does not work together with the

undo function, it may be because the domain name of the image are different, and the solution online is to write hundreds of lines of JQuery code, so we had to delete this function.

Wireframe prototypes

Prototype 1



Since this is designed for children, to make them feel like they are actually drawing something, I found a background image which a child is painting on the wall. And there are some different color bricks on the wall, which is designed to be the color plate, the canvas takes place in the right side of the children, consist of two simple color, black and white, which will make children's painting more colorful. In the left bottom corner, they can chose the size of pen or brush, from small to big, and the X button beside the size is a clear button, it helps to clear what was on the canvas, and there are several tools lays in the right bottom corner of the canvas, pencil and brush are for drawing, the stamp is designed to help children to draw something difficult with details in it, such as a ship, by simply click on the stamp and click on the canvas again, a predefined pattern will be appeared, the the rubber will help children to remove what they do not want in the canvas.

Prototype 2



This is the prototype that we agreed to implement for our app. For the theme of this layout, we went for a colourful, cartoon-like approach; since kids are drawn to such styles. For the background of the app, which will cover the entire screen of the device, a cartoon image of lake was chosen because Turner liked to paint lakes and we thought this was an appropriate reference to his style. The logo of the app is featured in the top left corner and features the title: 'Draw like turner!'. The canvas area, where markings can be drawn, is displayed like a painter's easel. There are two toolboxes featured to the right and left of the easel. The toolbox on the left features 12 colours that Turner commonly uses in his artwork. When you select a colour a blue border will be displayed to show that that colour has been selected. On a desktop, when you hover over the colours or the tools, they enlarge. To select a tool or a colour you simply click on it or tap it. For the toolbox to the right, there is 3 different tool sizes, a marker tool, a paintbrush tool, an eraser, an undo button and a 'clear-canvas' button. You can select any of these by clicking them or tapping them.

References

- Branding design
 - 'Short Stack' Google font for logo
 - Watercolour texture image:
<http://www.onlygfx.com/wp-content/uploads/2017/11/watercolor-brush-texture-2.png>

- Paint texture image:
<https://thumbs.dreamstime.com/t/colpi-di-ocra-gialla-del-pennello-isolato-78008819.jpg>
- Layout 1
 - Background image: <https://gratisography.com/photo/mom-graffiti/>
 - Cancel icon:
https://www.flaticon.com/free-icon/close-button_61155#term=cancel&page=1&position=19
 - Pen icon:
https://www.flaticon.com/free-icon/artistic-brush_15654#term=paint&page=1&position=11
 - Brush icon:
https://www.flaticon.com/free-icon/paintbrush_129817#term=paint&page=1&position=13
 - Stam icon:
https://www.flaticon.com/free-icon/rubber-stamp_66729#term=rubber&page=1&position=7
 - Rubber icon:
https://www.flaticon.com/free-icon/eraser_4374#term=rubber&page=1&position=52
 - Dots icon:
https://www.flaticon.com/free-icon/circle_319873#term=dot&page=1&position=23
- Layout 2
 - Background image:
<http://genitalintegrity2008.info/wp-content/uploads/2018/03/lake-clipart-7-s-lake-clipart-pond-scene-6.jpg>
 - Brush 1 image:
<http://images.clipartpanda.com/paintbrush-clip-art-paintbrush-clip-art-11.png>
 - Brush 2 image:
<https://www.freeiconspng.com/uploads/paint-brush-icon-png-20.png>
 - Eraser image:
<https://cdn4.iconfinder.com/data/icons/iconsimple-text/512/eraser-512.png>
 - Undo image:
https://cdn2.iconfinder.com/data/icons/toolbar-icons/512/Undo_Arrow-512.png
 - Bin image:
https://cdn3.iconfinder.com/data/icons/cleaning-icons/512/Trash_Can-512.png
 - Paint splash image:
<https://melbournechapter.net/images/splash-clipart-paint-spill-4.png>
- Clearing the canvas after 5 minutes:
https://www.w3schools.com/Js/js_timing.asp
- Brush like effect:
<http://perfectionkills.com/exploring-canvas-drawing-techniques/>
- Changing canvas background:

- https://www.w3schools.com/jsref/prop_style_backgroundimage.asp
- Blur feature: <https://css-tricks.com/almanac/properties/f/filter/>.
 - Final build icons: Icons made by Flat icons:
<https://www.flaticon.com/authors/flat-icons>