ANIMATION PROJECT

ShineOn

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Website:
https://wizardly-shirley-2e8dd2.netlify.com/

GitHub:
https://github.com/meganelndn/animationProject

Appendix

Introduction

The following documentation report aims to outline the task at hand and how our solution makes sense in a theoretical, as well as practical way.

To begin with, this project consists in creating an interactive site aimed for an exhibition of inventions that changed the world. We will be doing this by connecting our digital communication skills and knowledge about the web nowadays and thus translating this into a functional, digital solution.

Problem formulation

The Danish Museum of Science & Technology is planning an exhibition of inventions that changed the world. Our purpose is to create an infoscreen as part of that exhibition. The main idea behind the exhibition is to show the wider impacts of each invention; how each one branches out into several other inventions, that again branches further. What can be achieved with these new technologies together with the ones we already know?

Objective

Because this is a science and technology museum, our task was to choose a subject from three options and we decided to choose electricity and lighting, history and developments.

We have to showcase how technology, electricity and light are affecting and improving our lives on a daily basis. What was the greatest invention that stimulated an array of other developments, like for example the light bulb.

Tools

TRELLO

Using Trello to manage our workload and to list tasks, group and individual as well, has made our work easier and a lot more structured. We also implemented the idea of assigning tasks to team members so all of us could keep track of what the other was doing. This was mainly for the purpose of not interfering with each other's code so that we could merge our branches more easily on GitHub.

GOOGLE DRIVE

This was our main sharing platform, mostly for the design part of the project. While sharing ideas and communicating on Slack, we focused on sharing all our files and images on a shared google drive folder.
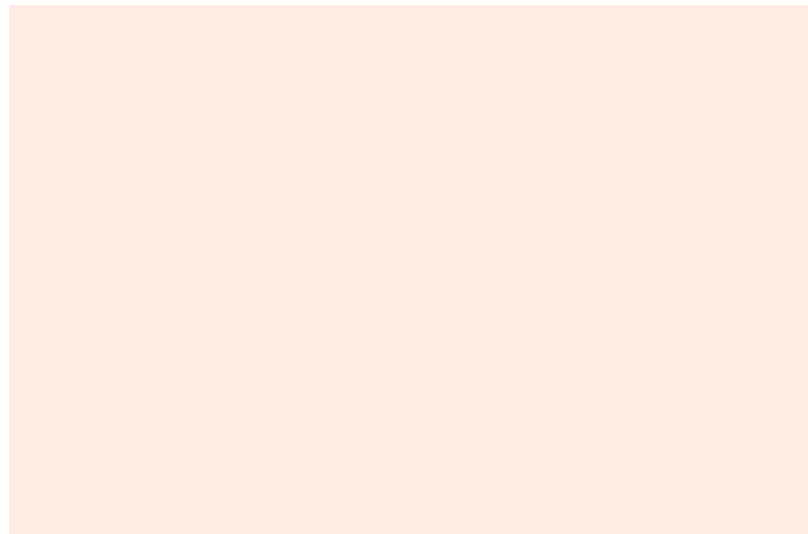
The Process

Research

ELECTRICITY

Electricity is an essential part of modern life so vital that most of us cannot imagine a life without it.

But – amazingly – it has only been an everyday aspect of our lives for a little over a century.

Back in 1752, when Benjamin Franklin demonstrated that lightning was electrical with his famous kite experiment, people couldn't even fathom the many conveniences and luxuries that electricity would bring to the 20th and 21st centuries.

ELECTRICITY IN THE EARLY DAYS

The first documentation in the history of electricity dates all the way back to 500 B.C. when Thales of Miletus discovered static electricity by rubbing fur on amber. But it wasn't until two thousand years later, in the 1600s, that English physician and physicist William Gilbert published the first theories about electricity in his book, *De Magnete*.

The exploration of electricity went up a notch during the next century, though and things started heating up.

In the early 1700s – decades before Franklin's kite – English scientist Francis Hauksbee made a glass ball that glowed when rubbed while experimenting with electrical attraction and repulsion. The glow was bright enough to read by, and this discovery would eventually lead to neon lighting a few centuries later.
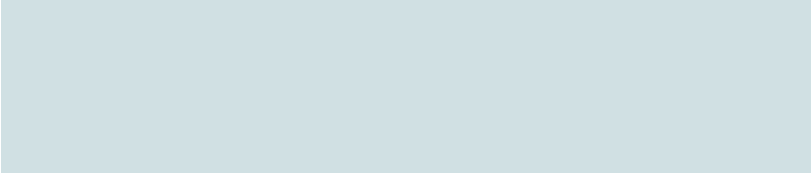
Fast forward to September 1882, when a house in Appleton, Wisconsin became the first American home to be powered by hydroelectricity. The station that powered the home used the direct current (DC) system developed by Thomas Edison. Over the next several years, "the direct current versus alternating current (AC)" debate captured attention, as Thomas Edison and George Westinghouse (who championed AC), competed for contracts.

THE WAR OF THE CURRENTS

Long before electric power in homes became mainstream, the standard form of electricity was the DC system that Edison developed through General Electric. Nikola Tesla, a student of Edison, believed that AC was a better option because, with the use of transformers, power could be converted to higher or lower voltages much easier and more efficiently. Edison argued – through what some refer to as a "misinformation campaign" – that AC was far more dangerous. This battle peaked in 1893 at the Chicago World's Fair when General Electric lost its bid to power the fair to George Westinghouse, who was using Tesla's AC system.

ELECTRICITY IN THE MODERN ERA

As we settle into the 21st century, electricity continues to evolve, yet innovations – at least when it comes to our sources of power – have come more slowly.

Coal, petroleum, and natural gas have been our primary sources of electrical production since the early 20th century, and alternating current still reigns.

But, there are changes underway. We are looking forward with hope!

Electricity travels at impressive speeds. In fact, electricity travels at the speed of light. It can surpass 186,000 miles per hour!

Lightning is a discharge of electricity in the atmosphere. Lightning bolts can travel at around 130,000 miles per hour and reach nearly 54,000 °F in temperature.

A spark of static electricity can measure up to 3,000 volts!

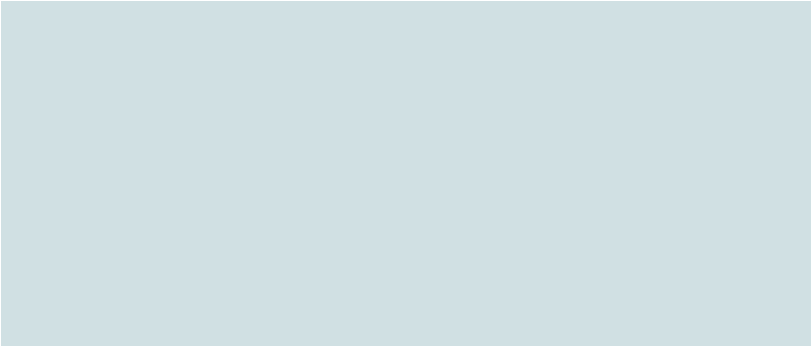*"We will make electricity so cheap that only the rich will burn candles."*

Thomas A. Edison

"Faith is like electricity. You can't see it, but you can see the light. "
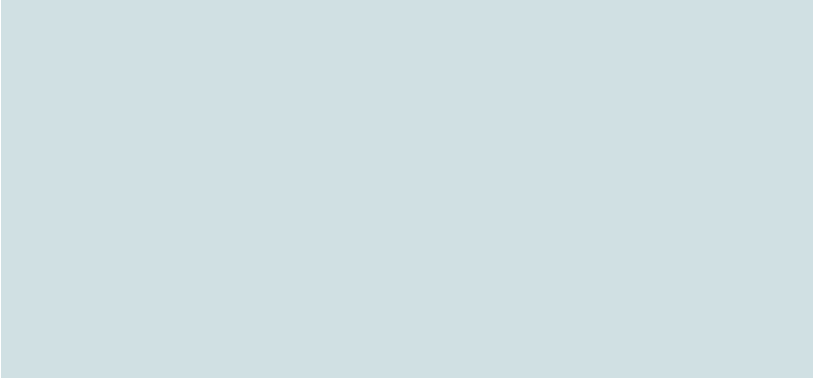
Gregory Dickow

"Let the future tell the truth, and evaluate each one according to his work and accomplishments. The present is theirs; the future, for which I have really worked, is mine."

Nikola Tesla

Animation theme, which was that of the timeline.
We were to showcase the most important impacts that the lightbulb, in connection with electricity, had had on the world and so our group agreed the best way was to display it in a chronological way on our site. You were to click on a timeline bullet and be displayed with information about
However, to make it more capturing to the user, we liked the idea of implementing a scroll feature where they would have to find their way to the timeline by navigating the site, making it more challenging and therefore interactive.

Design

CONCEPT

In the beginning of this project, we spent considerable time iterating the concept, as well as the design of our interactive site. We quickly decided we were going to stick to the "Invention of the light bulb" theme and thus decided to build on a previous assignment in this Advanced

XD PROTOTYPE

https://xd.adobe.com/view/3650808e-4efa-4c1c-4a74-8bc4d8334f
b2-4061/

DESIGN PRINCIPLES

Simplicity was at the core of our main concept design. We wanted to create an atmosphere for the user to be taken inside the context of the subject at hand - electricity and the invention of the light bulb.

We wanted our design to be *consistent* and clearly understood by the viewer. This is an important characteristic since life is so fast paced and catching the user's interest is becoming increasingly challenging because of all the visual pollution nowadays. I believe we all have a difference to make when it comes to our future, in order to find more new and environmentally friendly ways of harvesting, producing and distributing energy, electric or otherwise.

Easy loading is a very important feature and we thought this out before constructing the layers, wireframes and elements.

As the whole layout is easy to navigate, the user can scroll or drag or even click the screen, to reveal a horizontal layout which adds to the atmospheric context of an indoor/outdoor man-made environment.

COLORS & IMAGERY

An almost monochrome color palette and a few accents of blue and green make this design easy on the eye and give off a feeling of clarity and professionalism. The dark/light contrast is another key factor in our project, as we play with delicate white lines that work well together with a rough semi-textured background that bring us into another contrast - soft/hard textures and shapes. The circular shapes create harmony and flow, while blending together with the white text and dark background.

WIREFRAMES

The process of ideation was the most tedious and important, we used the crazy 8 method to brainstorm ideas and draw many sketches. After this, we choose just a few and continued on from there.
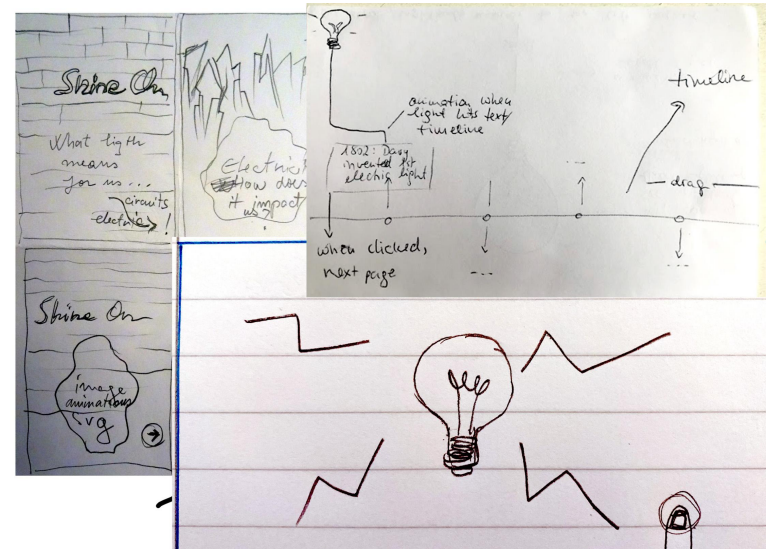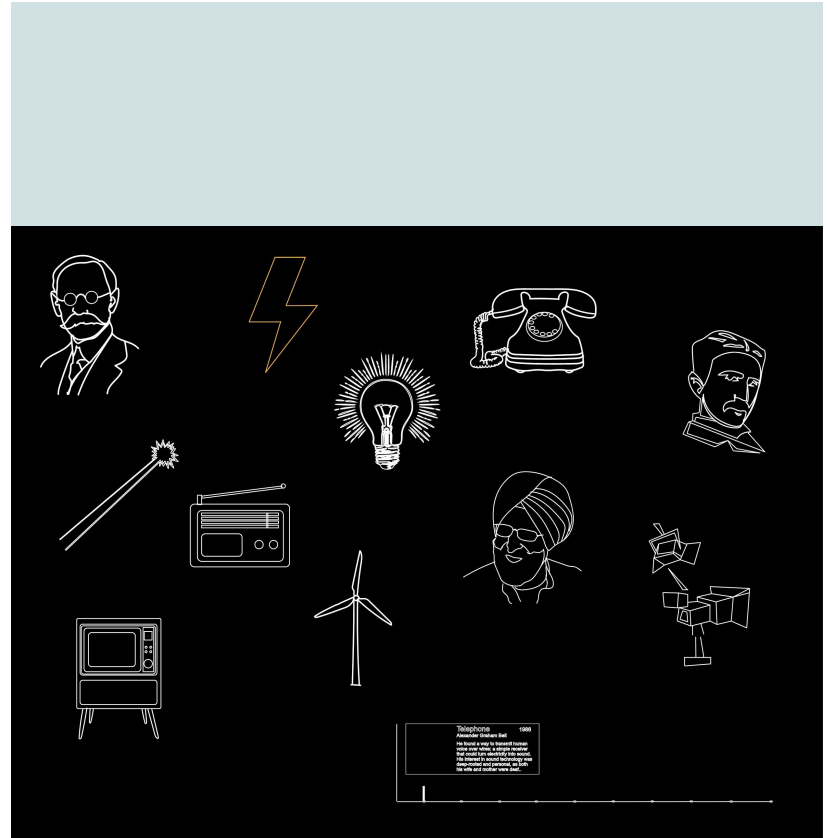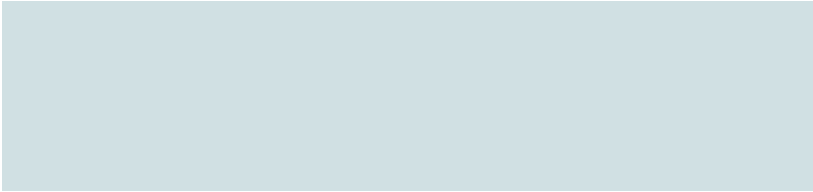
GRAPHICS

ASSETS-LIST

All our graphics were made by ourselves using illustrator, but some images from the timeline. To represent the inventors we used images with free rights and had them traced.

The original idea was to have the light bulb on the first part and the objects of each bullet point animated, which is the reason why they are all svgs. Later we discovered that due to technical limitation and time management we could not manipulate each of the objects of the timeline. We then decided to animate the timeline itself.

Timeline and box that holds information were designed by ourselves in illustrator and exported as svg.

STYLE TILE

In our style tile, we chose mostly monochrome colours, and clean cut lines. The simplicity of the elements on the page was mainly because our site would be displaying lots of content, which meant we had to find a way to package this well so it would not look too overwhelming to the user at first sight.

We ended up using the most simple fonts upon peer review, such as Helvetica in the title, and Arial in the timeline boxes, because it appeared that the other fonts were too heavy on the eye and did not go together well with our concept.

In terms of color, the blue was chosen since the idea was to have the call to action elements, as well as the title, highlighted in a neon effect. This effect could be best achieved with this color since the flickering white/blue in the title, for instance, clearly alludes to electricity and the effect of the light bulb, making our concept even more obvious to the user.

Animation

ANIMATION PRINCIPLES

STAGING
We used the principle of staging in our project to attract the attention of the user and offer a hint about the subject. In this case we could say that the background is the "*stage*" and the elements are the "*actors*".

The dark background is meant to direct the user's attention to the elements that are on the page, giving control over to the user.

By simplifying the design and user interaction, we are "*setting the scene*" for an interesting short-lived experience. The reason for this was to keep the focus of the viewer on what's most relevant in order to avoid unnecessary details.

THE PRINCIPLE OF SECONDARY ACTION
Adding a secondary action to an animation scene gives it more life and supports the main action. The constant flow of flickering light keeps the cosy atmosphere, but is reflected that this is a man-made environment. The beauty is reflected by the light while the coldness reflects the artificial tone of the theme. The constant animations are supported by the timeline animations which, in contrast to the others, are in the user's control. They are designed not to disturb, but to support the main action that the user decides to take.
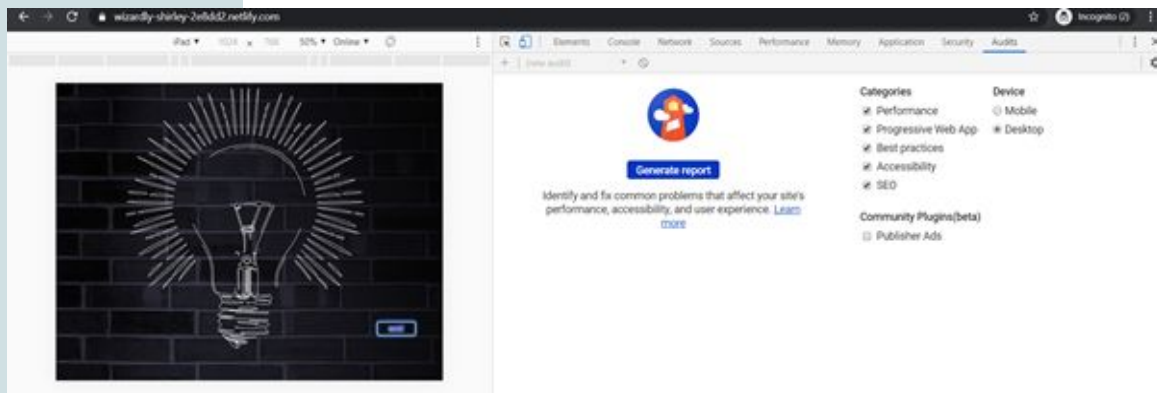
We used timing, to give the feeling that the elements on the page appear to obey the laws of physics. The flickering light is the main element used to establish a certain mood and atmosphere but every single other element has a very precise purpose and a time to be revealed.

Testing

LIGHTHOUSE TEST

We used timing, to give the feeling that the elements on the page appear to obey the laws of physics. The flickering light is the main element used to establish a certain mood and atmosphere but every single other element has a very precise purpose and a time to be revealed.
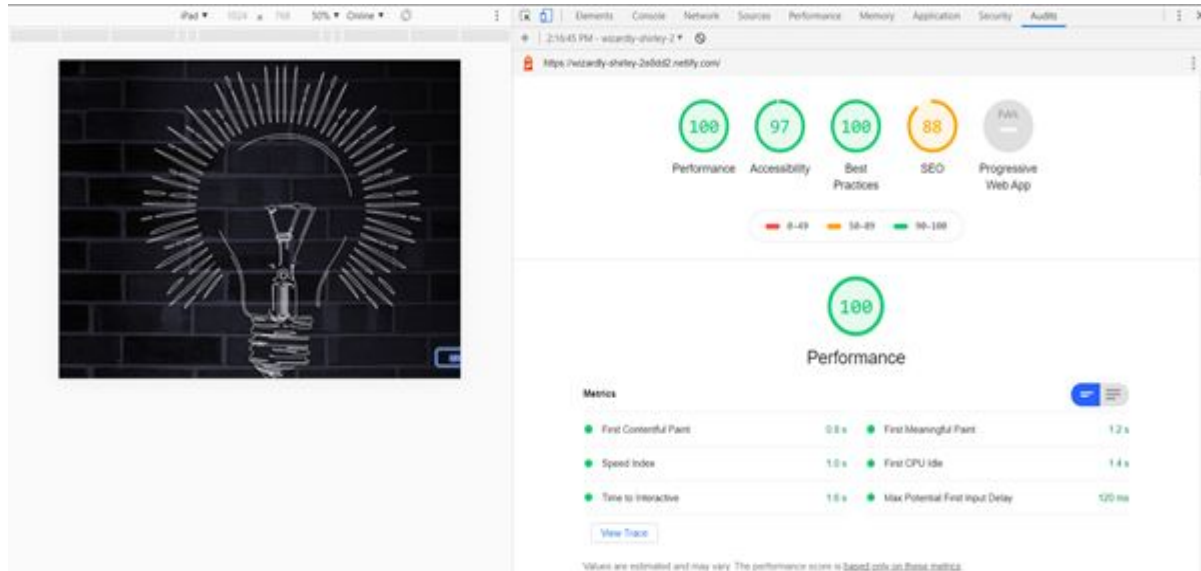
Testing

LIGHTHOUSE TEST

Lighthouse Audit:
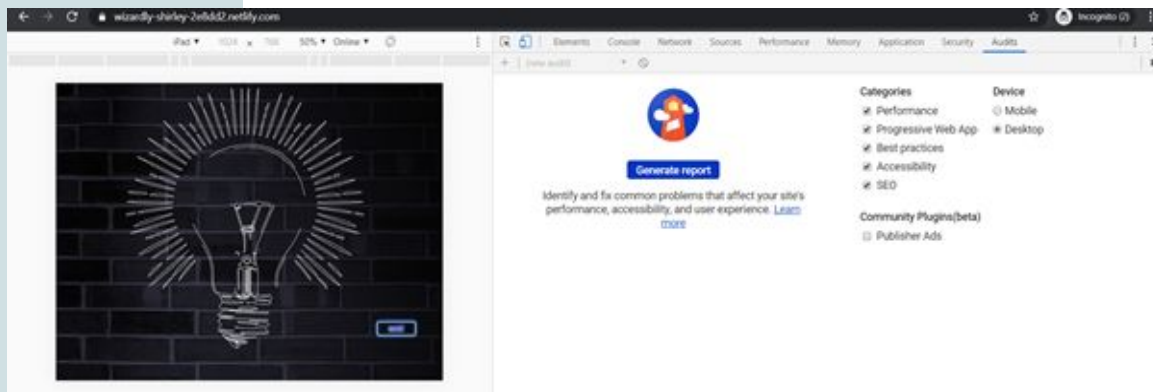
We achieved high scores running google lighthouse, except for SEO, which was not our focus as the goal was to have the product running on a tablet without internet connection.

The results also detected issues regarding the image loading speed, but again, our goal was to have the slow animation that catches the eyes, plus the product will not rely on internet connection.

View Trace

Values are estimated and may vary. The performance score is based only on these metrics.

Opportunities — These suggestions can help your page load faster. They don't directly affect the Performance score.

Opportunity	Estimated Savings
⚠ Serve images in next-gen formats	1.35 s ⌄
◼ Efficiently encode images	0.15 s ⌄

Diagnostics — More information about the performance of your application. These numbers don't directly affect the Performance score.

◼ Minimize main-thread work — 2.3 s	⌄
◯ Avoid chaining critical requests — 3 chains found	⌄
◯ Keep request counts low and transfer sizes small — 10 requests • 433 KB	⌄

Passed audits (19) ⌄

FULL LIGHTHOUSE TEST:

https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3Ae540f275-cbd4-4569-9c52-1a1699597638
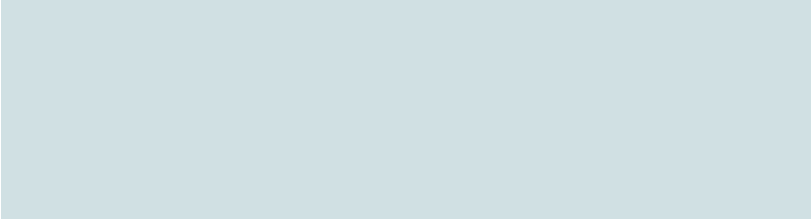
BERT TEST

It was not only until the last stages of the project, with testing and feedback, that we realized a crucial step was missing for us to accomplish our goal. As many groups, we had not defined a persona nor our target audience. By assuming the target audience was a museum, be believe that if we had defined our persona, we could have covered one group instead of delivering a global solution. For example, our solution is approachable for adults we did not take into consideration adults with children. By staying in between we lacked ideas, and some had to be cut, as we wished to please a group that does not exist, everyone.

We believe that is also the reason why the BERT test brought different results. Without the definition of the target audience, who takes the test will bring his/her own considerations and life experience when evaluating how the solution fits a museum. For instance a father may find the solution boring as he imagines his child will not have the patience for reading material and would prefer visual effects.

We believe this experience helped us shape our tools and methods as today we would be able to build a much precise test, also would have contacted the client more often in order to gather information and understand their final goal.

PEER REVIEW

We have been assigned to review another group`s project and we chose to build a think aloud test for them to evaluate our solution. Based on 8 questions we requested the other group to navigate on our site and express their feelings and experience. This usability test was the source of some important changes. The main animation, the lightbulb, would animate and leave the screen and after the peer review we were alerted that it would be a bigger experience to have the image on the screen for the user to appreciate it as it is highly detailed.

The opponent group experience on the site also helped us on deciding on the colour palette and buttons.

The results of both tests can be seen upon comparison of the initial prototype with our final solution, liked on the first page of this report.

Technical Documentation

JAVASCRIPT CALL GRAPH

Every function is fired from another, besides the light bulb animation that runs independently. We have only 3 global variables, which store the json object array, the user selection on the timeline and the svg class (timeline bullets).
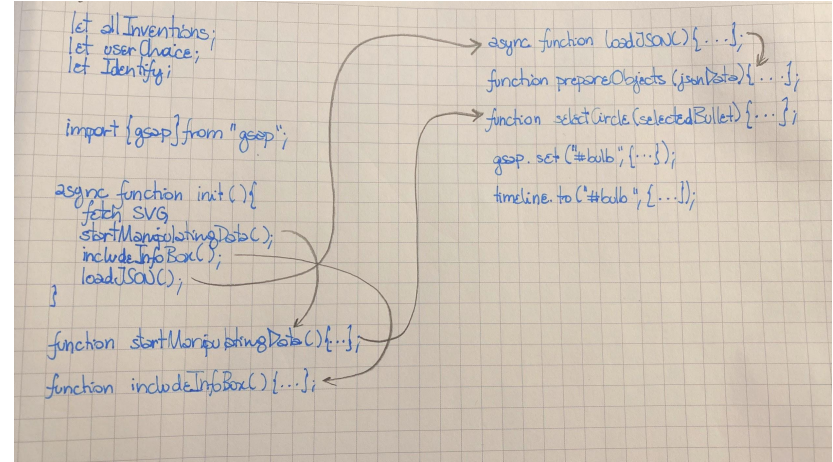
JSON FILE OBJECT STRUCTURE

Our JSON file is composed of 10 objects. Each contains the descriptive information used on the timeline. Title, year and inventor are easily imported through the selectCircle(selectedButton) function.
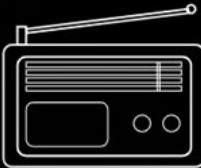
```
static > imgs > {} inventions_version2.json > ...
  1  [{
  2      "title": "Telephone",
  3      "id": "point1",
  4      "year": "1876",
  5      "inventor": "Alexander Graham Bell",
  6      "text6": " He found a way  to transmit human voice over wires:",
  7      "text5": "a receiver that could turn electricity into  sound. ",
  8      "text4": "His interest in sound technology was deep-rooted and",
  9      "text3": "personal, as both  his wife and  mother  were  deaf.",
 10      "image": "telephone_white.svg"
 11  },
```

Also, the biggest challenge with the JSON file was to distribute the text. After many attempts we realized it would not be possible to break the text via html, we would have to restructure our entire code to find a solution. That said we created a new timeline .svg file and added 6 lines to fit the text, we manually split the text in the svg so that we could manipulate each line with JavaScript.

For that reason our objects have from 1 to 6 "text" objects, final output being the information box that display the text format as we wish.
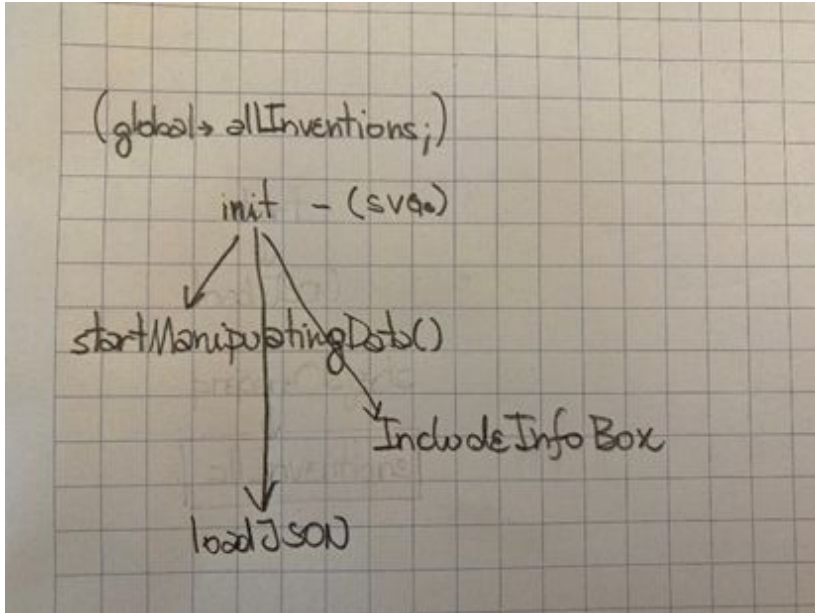
We have included a special name "id", which value was set as the class Name used on each bullet from our timeline. By manipulating this data we managed to combine the first bullet with the first object, and so on, using the method .find in order to locate and match the bullet Class with the JSON object "id" value.
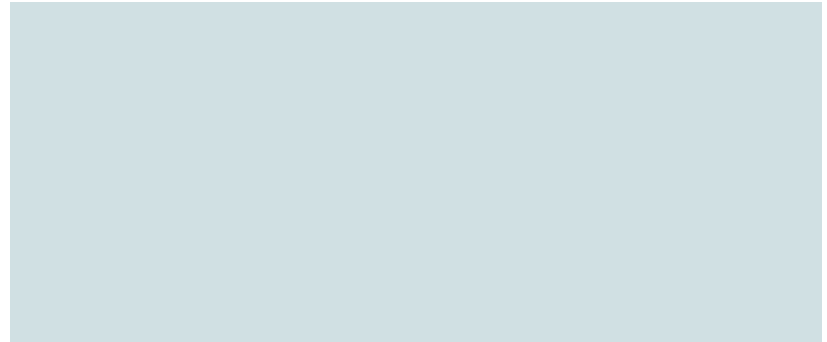
ACTIVITY DIAGRAMS

Basic timeline structure

As one of the main points of the project, the SVG files are fetched straight in the init function, which also fires 3 other important functions for this structure: **startManipulatingData**, **includeInfoBox** and **loadJSON**. The first sets the dimensions and details we need, with some part being hidden until the first click happens, it also fires the event listener on click for each bullet of the timeline. **IncludeInfoBox** contains the createElementNS, which allows us to use the Box svg within the timeline. Finally, loadJSON, fetches the objects, which are save into an array called **allInventions**.
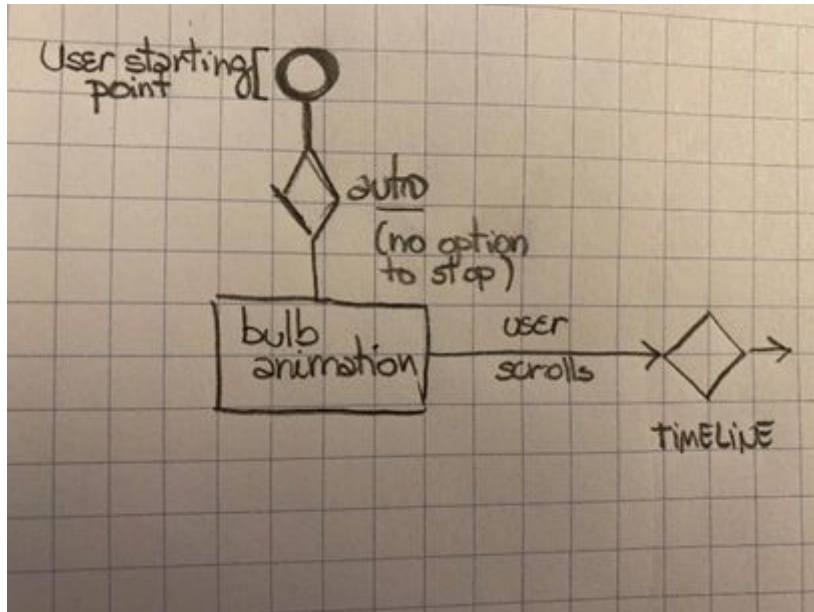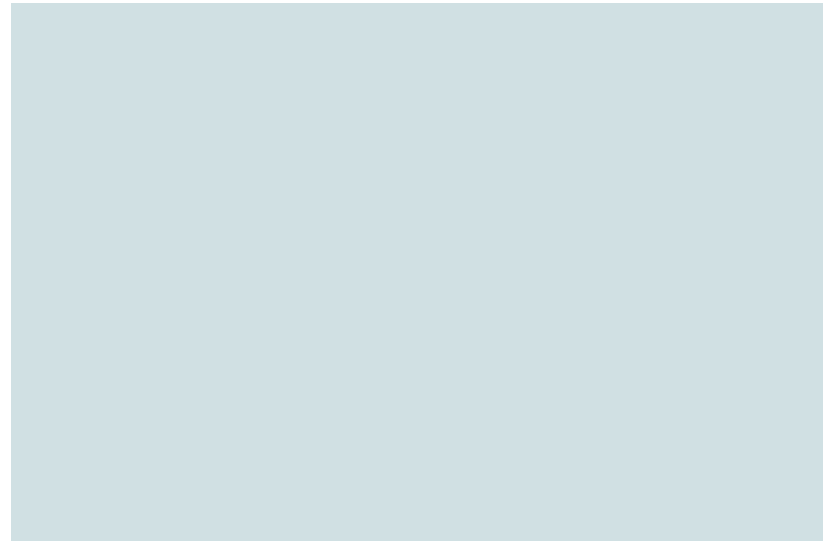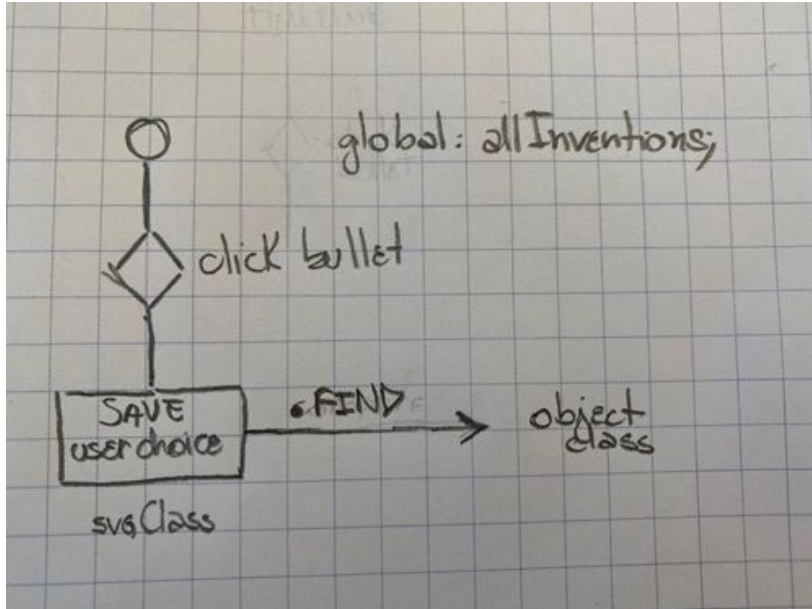
Light bulb

When the page loads the user has no option, as we intended, and the gsap light bulb animation runs. At any moment the user may scroll and move forward, though our intention was to catch the eyes, therefore the big animation takes the screen.

ACTIVITY DIAGRAMS

Finding correspondent JSON Object

When the user clicks on a bullet, the targeted user option is saved, what we save is the class of the bullet clicked. Intentionally, we have added "id" object to the json file, the value of each being the class of each button. Through the find method we locate in the array the object that contains an "ID" that matches the Class of the target bullet.

With the result we build each information box with the correspondent json data.
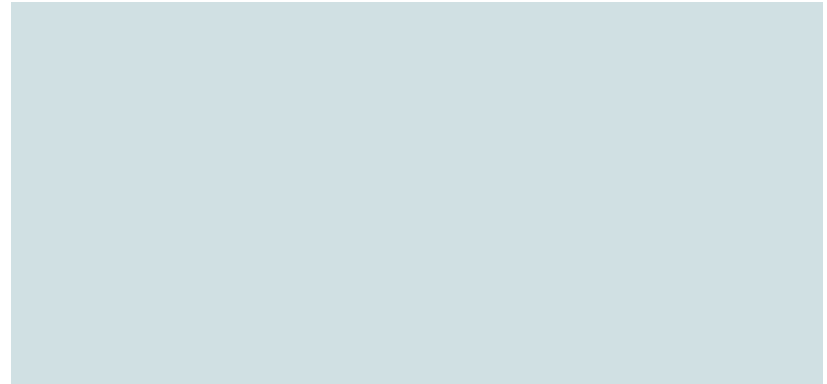
SASS & JAVASCRIPT MODULES

All the images reside in the static images folder as shown below:
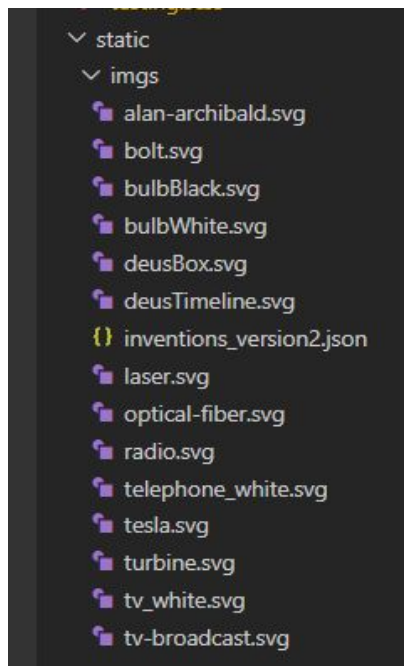
As we ran tests with different svg files for the timeline and some objects, at the end of this project we cleaned up the folder, limiting the imgs folder content to files that are currently being used. As an implementation point, we would like to rename some files accordingly, in order to facilitate the access from third parties that could have trouble understanding the content of the files by their title.
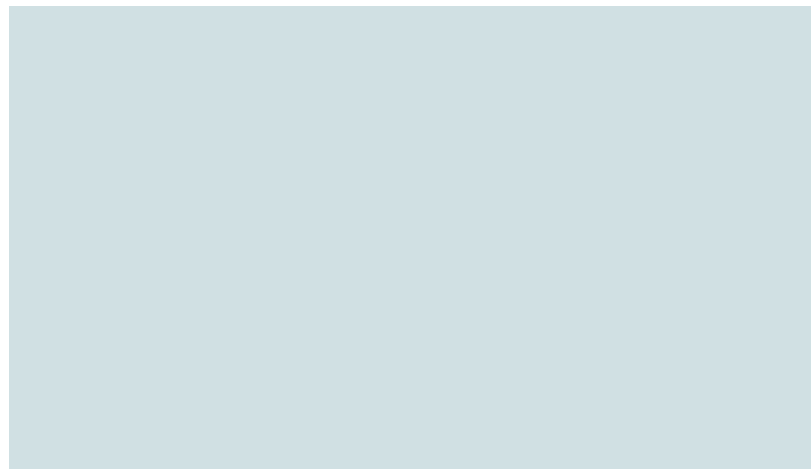
Conclusion

This project impacted us in many ways and considering the current situation we believe this was fundamental for us to improve our communication skills. Being in a lockdown situation and relying mainly on text communication we had to overcome several pain points, establish and organize routine and make sure we were expressing ourselves in a clear manner. Once coming around communication failure, we teamed up and our individual abilities arise, each of us taking over a different section of the project.

Our goal was to deliver a complete solution to the Design Museum in regards to electricity impacts. We managed to build an interesting timeline on the subject with visual effects to attract any visitor. Upon the customer feedback we discovered important points and we would like to

implement a few changes to ensure that the product fits the customer needs.

For example, we would rather prefer the product to communicate about electricity with more visual effects and less text. The animations could me expanded into the original idea of having the lines drawing the story. We would remove the buttons and make it more intuitive, with indications of a timeline being drawn via animation instead of a heavy button.

We have also learned that it is not possible to deliver a precise solution without fully tracing the target audience profile as this would have narrowed our creative process and we would have had more time to enable animations and build code, instead of debating ideas.

Overall, we are pleasant with our solution, we believe to have met the final goal and find space for improvements. We appreciate the opportunity to work on such a challenging project with the Design Museum and look forward to future corporations.