Noroff
School of technology
and digital media

Technical Report

Project Exam 1

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Live site

https://lybo.dev/projex1

Repository:

https://github.com/Noroff-Fagskole/project-exam-1-thereselybo

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Document History

Date	Version	Document Revision Description	Document Author
23.04.2020	V1	Project planning document	Therese Lybo
03.05.2020	V2	Target audience, personas, storyboards, wireframes, prototype. Edits in use cases	Therese Lybo
13.05.2020	V3	Design process, content, development process, conclusion, summary	Therese Lybo

Table of Contents

1. Summary

This report contains discussion about Project Exam 1 for the first year of Front-end Development, which is completed using skills acquired throughout the year. This includes knowledge within design, web and communication technology, HTML, CSS, project methodology, JavaScript and interaction design.

The result is a microsite for SpaceX contains four pages; Home, Missions, Contact and Mars. These in turn consist of a display of number of humans currently in space, a countdown to the next SpaceX mission, a map of the current location of the International Space Station, a timeline of past SpaceX missions, a contact form, a countdown to Elon Musk's goal of sending a human to mars, and a report of recent weather on Mars.

The project has been divided into five phases; planning, research, design, development and launch. In this report I will go into detail with/about my experiences throughout them, which decisions I have made and what I have learned during the process.

2. Body

2.1 Introduction

Project scope

For my first project exam the objective is to provide either NASA or SpaceX with a microsite which will contribute to raise awareness about space program activity. The microsite is to be made up of at least four responsive pages, among other things consisting of a timeline to display launches, a JavaScript validated contact form and links to provide more information. These elements will be described further in 2.3 Functional Specifications.

This project is a personal project exam, with myself as sole author and creative resource.

Purpose of document

The purpose of this document is to record the progression of the project from the planning phase to submitting the final product. I will discuss the experiences I have and possible issues I might encounter, as well as decisions made along the way.

2.2 Gantt chart

The following segment contains an overview of the project broken down into milestones, in the shape of a Gantt chart. This chart shows the order in which I planned to execute the tasks as well as the amount of time I planned to spend on each task.

As per the exam brief I mainly aimed to do the planning the first week, research and design the next week, and then move on with the development after that. I did however adjust the schedule slightly and decided on a time frame based on experience from previous assignments.

For instance my speed has improved when it comes to planning, however writing functional specifications is new to me, so I dedicated two days to work on that specific section. Nevertheless I aimed to finish the project planning in four days and thus have an extra day for research during the first week.

I am also starting to find myself quite potent in writing HTML and CSS. Where I have previously planned on spending five days doing so, I now strived not to spend more than three days and rather have a few more days to implement JavaScript, as that is still somewhat new.

Other than that I expected the time management to be relatively straight forward, spending about a day or two on each task.

Project Exam 1 - Gantt chart

TASK NAME	APRIL									MAY										
	WEEK 1					WEEK 2				WEEK 3					WEEK 4					WEEK 5
	20	21	22	23	24	27	28	29	30	1	4	5	6	7	8	11	12	13	14	15	19	20
Plan																						
Project planning																						
Gantt chart																						
Functional specification																						
Planning document																						
Research																						
Analytical research																						
Target audience																						
Personaes/storyboards																						
Choose API and other content																						
Information architecture																						
Design																						
Design research																						
Wireframes																						
Style tile																						
Prototype																						
Build																						
HTML																						
CSS																						
JavaScript																						
Cross-platform and cross-browser testing																						
Bug fixing																						
Validating																						
Launch																						
Final refinements																						
Report																						
Submission																						
Presentations																						

2.3 Functional Specifications

In the following section I will specify and describe required functionalities and features the website must include, as well preferred ones the website should include. I will also present a selection of use cases based on some of the features which might be prominent for the result of the project. Further features might be added at a later stage.

Features

Feature	Description
Essential information	The user shall be able to gather a certain amount of information about space program activity
Links to more information	The user shall be able to navigate to other sites for further information about space program activity, such as NASA and SpaceX
Timeline of launches	The user shall be able to see a timeline or schedule of upcoming launches. This shall be implemented using API.
Newsletter	The user shall be able to sign up to a newsletter and get information regularly
Contact form	The user shall be able to contact SpaceX/NASA through a contact form. This shall be validated with JavaScript.
Cross-platform functionality	The website shall be responsive and function well over a variety of platforms
Contain 4 pages	The website shall include a minimum of 4 pages
WCAG adapted	The design of the website shall conform with WCAG standards

Use cases

UC-1	As a user I can read the essential information and navigate easily to other
Primary Actor(s)	Visitors
Benefits	To inform user about space activity and NASA/SpaceX in particular
Trigger	User hears something about the space program and wants more information
Scenario	1. Does Google search on NASA/SpaceX 2. Enters website 3. Reads through the primary information provided on the landing page 4. Finds and follows link to NASA or SpaceX
Feature(s)	• Essential information • Links to NASA/SpaceX
Priority	High

UC-2	As a user I can submit a question to ask SpaceX a question
Primary Actor(s)	Visitors
Benefits	To make it easy to get in touch with SpaceX
Trigger	User has a question to which they have not yet found an answer to
Scenario	1. Has a question 2. Navigates to contact page 3. Fills in contact form 4. Submits form 5. Gets automated answer about how we will get back to them soon 6. Gets answer to their question
Feature(s)	• Navigation • Contact form
Priority	High

UC-3	As a user I can look and read through the timeline to learn about the upcoming launches
Primary Actor(s)	Visitors
Benefits	To inform user about the launches so that they can be better informed
Trigger	User hears about upcoming launch and wants to learn more
Scenario	1. Hears about upcoming launch 2. Enters website 3. Navigates to correct page 1. Sees timeline/schedule
Feature(s)	• Navigation • Timeline of launches
Priority	High

2.4 Research

Market research

After finishing the planning phase I moved on to market research. To get the most accurate result possible I figured I had to decide on whether to focus on NASA or SpaceX, and landed on the latter.

Doing the research I found that SpaceX is a corporation which focuses on reasonable space transportation. They work to revolutionize space technology, and their ultimate goal is to enable people to live on other planets.

I found that some relevant stakeholders would be corporations and organisations with an interest in space affairs, as well as any people interested in space activity in general.

Now, given that the assignment brief stated that the microsite should contribute to raise awareness about space program activity, I came to think that these large organisations already are quite enlightened about the field in question. With this in mind I figured I would aim the content towards an audience who might not already have too much expertise in this field and landed on targeting students and youngsters in particular, and in general anyone curious about the subject.

It is quite a wide target audience, but the main objective is to make the information engaging and interesting, we would not want it being too technical and formal. Anyone who would want to immerse themselves further into the topic will be easily guided to the SpaceX website.

Personae/storyboards

Using the information from the market research I created a few personas representing user groups probable to benefit from the microsite, to improve the system according to their needs and thus create a better user experience. These personas are obviously based on assumptions as we do not have insight into web analytics. The results are nonetheless presented below, followed by storyboards to provide a visualization of how the system might be used.

Polly the Pupil

SHORT NAME
POL

IMAGE

DESCRIPTION

Polly is an elementary school pupil who is interested in space. She likes to learn but is easily distracted.

NEEDS

- Understandable language so she is not discouraged
- Fun and engaging content
- Easy navigation

AGE

12

GENDER

Female

TECHNICAL PROFICIENCY

Medium-low

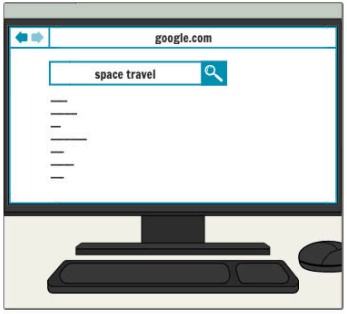
SCENARIOS

- Uses site for school projects
- Uses site for day dreaming

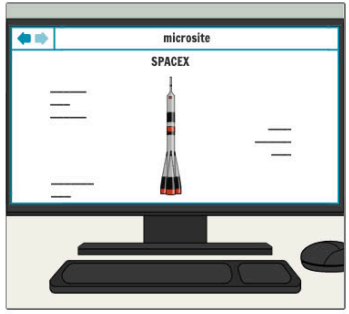
BEHAVIOR

Doesn't read through large blocks of copy

Polly has a school project where she is asked to write about something that interests her.



Perhaps something about space travel?
She does a Google search and finds the microsite



Polly browses the site and finds fun information in an uncomplicated language, presented in an engaging way

She makes her project, is happy with the content and is excited to share her findings with the class

Stan the Student

SHORT NAME
STA

IMAGE

AGE
21

GENDER
Male

MARITAL STATUS
Single

TECHICAL PROFICIENCY
High

DESCRIPTION
Stan is a tech-savvy engineering student. He is interested in anything tech related and is fascinated with advanced space technology. He doesn't mind if the language is too advanced, but he is still a little boy at heart and would enjoy a fun system to interact with.

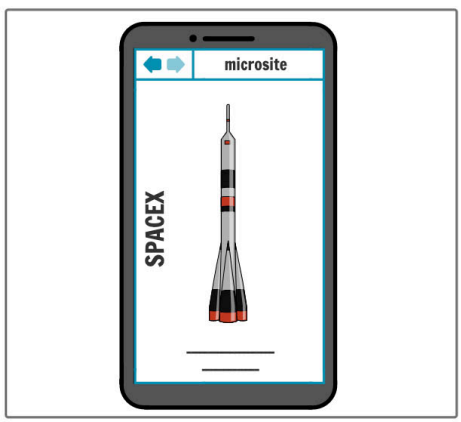
NEEDS
- An entertaining, yet informative microsite
- Interesting facts
- Mobile responsiveness

GOALS
- To learn more about space technology
- To have some fun

SCENARIOS
Uses site for own personal interest

BEHAVIOR
Examines site thoroughly but effectively

Stan is having some free time one evening. He is browsing the Internet on his phone and comes across the SpaceX microsite



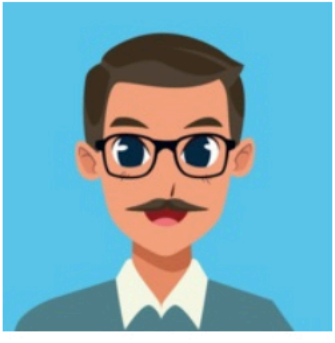
Stan reads some interesting facts about space technology, all the while having fun and not feeling as though he is reading a Wikipedia article

Stan is left feeling well informed and amused

Bob the Business Man

SHORT NAME
BOB

IMAGE



AGE
45

GENDER
Male

MARITAL STATUS
Married

TECHICAL PROFICIENCY
Medium

DESCRIPTION
Bob is an educated, well-informed business man. Doesn't need a website to be pretty as long as it's practical.

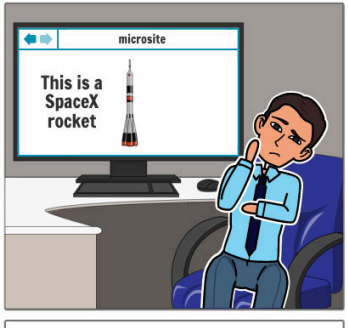
NEEDS
- Information
- Intuitive layout
- Links to more informative sites

GOALS
To be able to discuss the topic in detail

SCENARIOS
Uses site to gain more knowledge

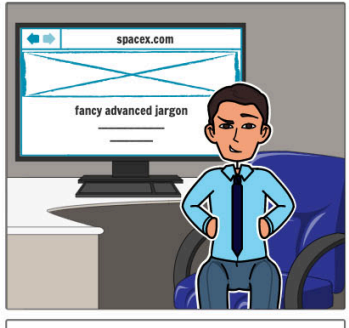
BEHAVIOR
- Examines site down to detail
- Looks for ways to gather more information
- Impatient

Bob has overheard a conversation during his lunch break the upcoming space launch. He is annoyed not having enough knowledge about the subject and decides to read about it



Bob stumbles across the SpaceX microsite but finds the jargon a bit too simple for his taste.

He sees several links leading him to, among others, SpaceX's own website, which he finds a better choice for his purpose



Bob now can show up to work well informed, and up to the task of challenging his colleagues in a discussion

2.5 Design

Design inspiration

Link to personal Pinterest board:

https://pinterest.com/thereselybo/project-exam-1/

Other sources of inspiration:

- https://av-spacex.surge.sh/allpayloads
- https://mars.nasa.gov/insight/weather/
- https://www.spacexstats.xyz/
- https://spacexmissionwatch.com/
- https://mars.nasa.gov/
- https://spacecoastlaunches.com/

Style

As per the market research and user personae results my goal was to build a microsite mainly compelling to a slightly younger audience, with engaging design and content. I for one tend to see a connection between outer space and science fiction, and so I aimed for a design which was to give an exciting feeling of being in a spaceship, or being in outer space.

As I see it SpaceX is a well renowned company with a certain image to maintain, and so I thought it was important to still keep some of the focus on being informative and making sure the content is relevant and not all fun and games. This was also important considering the Bobs of my target audience, so I wanted to find a balance between these traits.

Typography

Initially I considered a futuristic font for headings, perhaps something similar to the SpaceX logo. I did however quickly decide against doing so, and figured I could achieve the futuristic feel in another way. I played a bit around with monospaced fonts and all capitalized sans serif fonts because I get quite a bit of a science fiction vibe out of those. Ultimately I decided to go with one of my favorites, Roboto, for both headings and body copy so as to let the logo be the hero, and still contain a slick and slightly futuristic feel.

Colors

I had this idea of incorporating a burnt orange inspired by Mars, and create a palette around that. When creating my Pinterest board I came across this beautiful palette created from a Shutterstock image, I just knew that was exactly what I was looking for. So I based my palette on the burnt orange, and was further inspired by this other palette and ended up with a lovely complementary trio, combined with white for the copy. Both the orange and the white made up for neat contrasting towards the blue and the darkness, and are of course made sure to maintain WCAG standards.

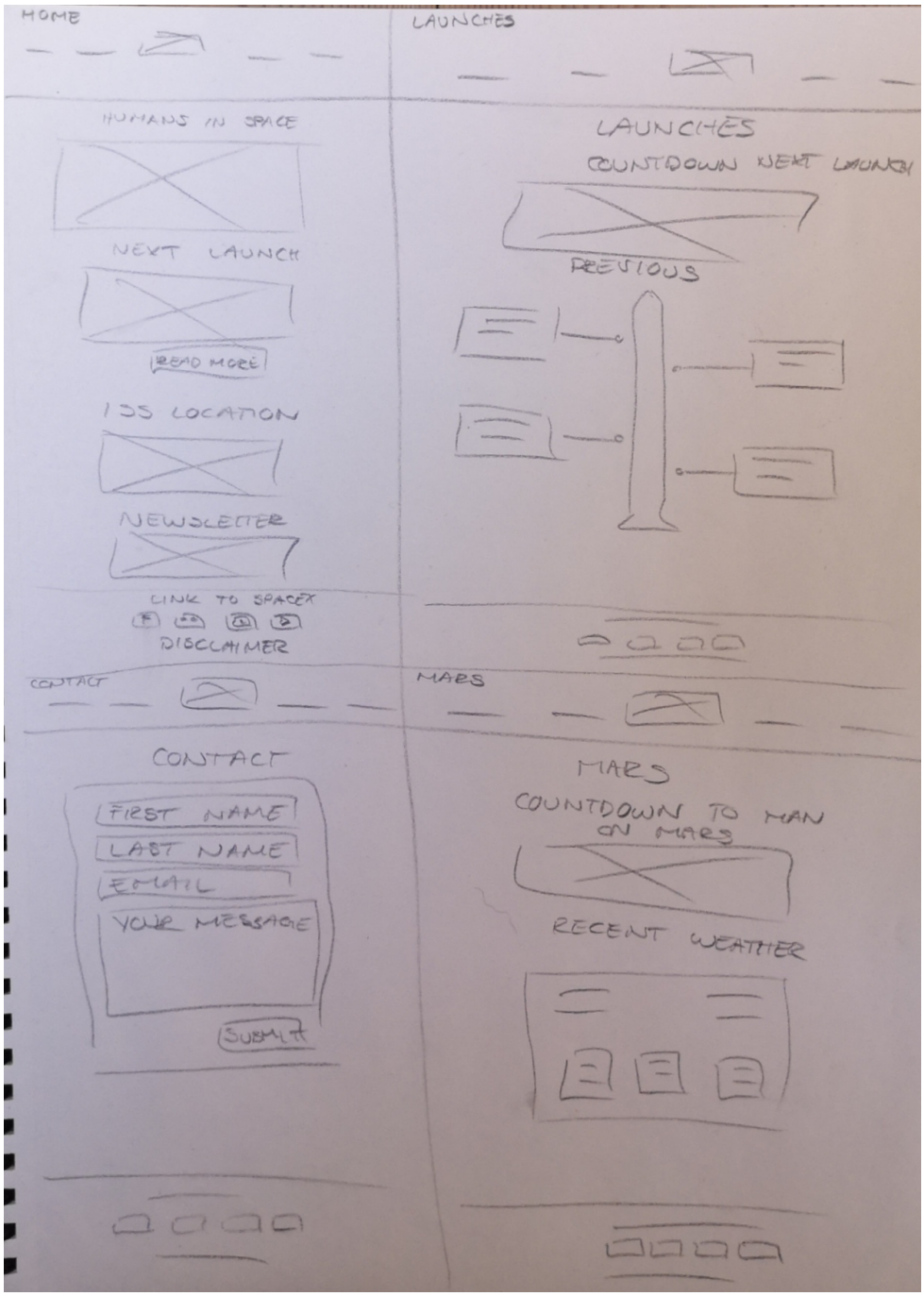
Graphics/Visual elements

Also during the development of the Pinterest board, I encountered several sets of futuristic control panel elements, or hud UI elements as some were called. I then started to work out a vision of how the microsite would turn out, with a futuristic circular element as a loading spinner, and these control panel elements to contain certain content.

I also started to play with the idea of how the call-to-action buttons would turn out, and decided to use the contrasting burnt orange to make sure they would stand out, and created the buttons in a fun slightly complex shape, giving them a certain je ne sais quoi.

Furthermore I wanted to implement the SpaceX rockets in some way, as this in my opinion is an important aspect of their image so to speak. Ultimately I ended up using a vector-image of a rocket, which looked slightly like the Falcon 9, and edited it to fit the look even more, and implemented it in the timeline.

Wireframes



Prototype

Link to prototype: https://xd.adobe.com/view/db4c2963-4fcd-414c-728e-b97e517b1078-ad7d/

2.6 Content

When choosing my content and APIs, I had in mind that a microsite often is more graphic and visual rather than all about statistics and plain information.

I had an idea of including fun facts about space, planets, in general anything which would contribute creating the feeling of outer space to speak to the Pollys and Stans of my target audience. So when I was looking through the API sources we were provided with I had little trouble picking out a number of suitable possibilities.

Here are some of my ideas:

- People in space
- Next launch or launches
- Previous launches
- Rockets
- Photos from Mars
- Photos of the Mars Rover
- Countdown to Elon Musk's goal of sending man to Mars
- Map with location of the ISS
- SpaceX Launch Pads
- Some sort of game, like Space Invaders

Although I got a decent number of ideas I also did not want to overdo it. So I dialed it back a bit and landed on a number of items which I figured could speak for themselves, make it clear what the site was about, and

keep the fun part intact. To accomplish this I used between 1 and 4 main features on each page.

One of my favorite features is the map with current location of the ISS, which I think is a bit of a statement piece. I also think the timeline is a fun addition, although it would be a bit tedious to have to read through 93 previous missions and counting. Therefore I decided to only list the 20 most recent ones, as to be cohesive in terms of not being all about plain information.

There are also the Bobs to include when laying content strategy. Bob wants to gain knowledge, and he wants to gather information into more detail rather than fun facts and features. As such I added a clear link to the official SpaceX website both at the top and bottom of the site. Now, he may still get use of the site and the features such as timeline and countdown, as these might be useful and fun topics in a discussion.

Persuasive techniques

In terms of persuasive techniques I worked with a few relevant ones. Regarding credibility I think it is helpful to be associated with such a renowned company and brand such as SpaceX, and using content from them and an esteemed organisation such as NASA. I also added a newsletter signup at the bottom of the home page, so that it is not the absolutely first thing that pops up when one visits the site.

Affordances

When it comes to affordances I have considered the following. The items on the timeline appear to be connected due to the pattern of their

respective positioning. Other user-centered pattern affordances more or less explain themselves, such as the navigation, the buttons and the social media icons at the bottom. Except for the latter, as well as the hamburger navigation on the smaller screens, I have mostly used explicit language. For instance it is clear that the button saying “Read more about previous missions” will lead to the area containing previous missions, and the usage of words rather than icons in the navigation. I have also made sure that the hover state of the navigation items and the buttons demonstrate a possibility of interaction.

SEO

To ensure good SEO I worked with the meta description and keywords, some of which different on each page to specifically target the proper page. I also made sure to use a different title on all pages, as well as other WCAG considerations, and as a bonus the search engines favors that.

2.7 Development

HTML

When developing the site, I have made sure to provide semantic meaning using elements such as header, main, footer and section. I used class names and id names in conjunction with their respective elements, making the code more readable as well as easier to work with. To achieve the latter I also I ensured proper indentation on HTML pages, as well as formatted CSS and JS files using Prettier Code Formatter.

The usage of ARIA-roles on associated elements and alt attribute on images is important for accessibility. As mentioned I also regarded proper usage of headings, as well as appropriate headlines and sub-headlines which too are crucial for accessibility and WCAG, and this is in turn also good for SEO.

CSS

As stated in the project scope, one of the requirements of the project is responsiveness. To achieve this I have worked with media queries, structuring with focus on mobile-first and moving upwards in size so that the smaller devices won't have to load unnecessary code, and I also tried not to repeat the styles.

Something I was a bit torn about when writing the CSS was how to implement the futuristic frames/borders around certain divs and buttons. I was really eager to learn about how to create all of them using CSS, but quickly realized that it would probably be very time consuming. So I decided to firstly make it as easy as possible, using images, and if I had time leftover towards the end of the last week, I would sit down and experiment with CSS.

The shape of the buttons would turn out to not be too difficult, as I could use clip path, something I had familiarized myself with for a previous project. However I had trouble getting the glowing effect to work on the clipped shape. When doing some research on this I found that I could use a drop-shadow filter on the parent element,
The solution is probably not the best, but I think it does the trick.

I also thought a lot about how to accomplish the look of the timeline. I tried out absolute positioning and unordered list, but landed on floating divs using :nth-of-type. Considering the lines and circles pointing inwards to the spaceship I looked into usage of ::before pseudo-elements, however I could not quite get the hang of it, so I settled for positioning a span element in stead.

Javascript

Fetching APIs itself has almost become second nature. Creating the Humans in Space feature, piece of cake. The countdown to putting a man on Mars, also pretty straight forward. Building the map for the ISS location was however quite the challenge. I naively thought I could just embed an iframe and somehow target the coordinates in some simple way. Boy, was I wrong.

After spending a lot of time on Google and contemplating just displaying it as plain copy, I found that implementing Google Maps API would be the best solution. It was however still a bit of a headache getting it to work and display as I wanted. I experimented with setInterval, and new methods such as setPosition and setCenter to be able to update the map to its actual location every second. My solution of putting the whole fetch in a function also solved an issue I had with the countdown timer to next mission, which also was to automatically update every second.

As for the timeline I wanted to show the most recent launch on top, and go backwards as one scrolls down the page. To achieve this I reversed the resulting array after the API call. I also only wanted to display the

last 20 launches, and so I used a simple for loop and created a div for those 20 results.

Then I moved on to the weather report from Mars. For this I used a NASA API. That API call returned JSON as an object, and for my purpose I needed to find a way to iterate through it a number of times to only get the four days I wanted in my report. I did struggle a bit with this, but I found help in a FreeCodeCamp post, and as it turned out, there was a lot of useful information in a document NASA provided as well.

I also wanted to display the date in another format than provided in the API, and for this I used the substring method. This was also handy for the timeline posts. Furthermore, when displaying the temperatures, the numbers became quite long with all the decimals. To solve this I used the split method, but needed a string to make that work, so for that I used the toString method.

Next up was the responsive burger nav, as I was too lazy and impatient to do it in the beginning. I had recently played around with it and found an easy way around it with a simple click event.

And finally I had to create a loader. I opted to make a full size loading wrapper and a futuristic looking loader, with a script which was to remove their respective classes when the window was completely loaded. And that was that.

Testing and validating

As planned, I just about finished writing HTML, CSS and JavaScript by the end of week 3, and starting week 4 I was ready to move on to testing and validating. I had some more issues with the Open Notify API, as I was calling HTTP and the fetch somehow turned the url to HTTPS, which in turn returned nothing at all. I found a work-around for this by using Heroku, but then another error occurred, blocking the new cross-origin request. With help from Manny I was able to fix this by adding a header to the fetch.

From there I only had to fine-tune some styling which did not look too good on all platforms. I found my way to developer tools and web inspector for my Android phone and iPad, so that I could do debugging in an easier way. At this time I decided to remove the lines with the circles at the timeline, as their positions were too unpredictable when scaling. In my opinion it was better to remove them than having issues with them on too many platforms.

Ultimately I tested the site on two desktops, two smartphones and one tablet, as well as all virtual devices on Safari Responsive Design Mode before I decided it was good enough. I then cleaned up and formatted all code, and published the final result.

2.8 Conclusion

I have had a lot of fun during these past few weeks. As per usual I have taken the opportunity to try and learn something new, and boy did I ever. And although I am sure I could have spent the time somewhat differently, I would have loved to have another week or so to explore

different approaches to certain aspects of the project. I may not have followed my planned schedule to a tee but I am not sure I could have planned it much differently, so overall I think that part went well.

Is the final result completely perfect? Certainly not. There are still certain elements which I am not completely satisfied with, such as the fixed spaceship background, which is something I would like to play more with and learn more about, as for other ways to solve it and implement it. In retrospect I also think I could have added a little more zing to the whole timeline, but I am relatively pleased with it. As I mentioned several times I intended to use the time I might have left to go back and experiment more with certain features, but it gets to a certain point where one has to decide the product is good enough.

All in all I do think the final result of the project turned out pretty cool, and in my opinion it would fulfill its task as a microsite and engage its target audience. I think I managed my goal of creating a playful and engaging place to learn some fun facts and experience cool features, and easily be able to navigate to the official SpaceX website for further information for those who are particularly interested.

3. References

- Various lessons in courses from FEU1

Files provided

- Technical specification template
  https://cdn.discordapp.com/attachments/701704694048882774/701744479689900142/Technical_specification_Template.docx
- Functional specification document template
  https://cdn.discordapp.com/attachments/701704694048882774/701417074059510 26/FRS_Template_Module_Assignment.docx

Tools

- TeamGantt excel template – Manual Chart
  https://www.teamgantt.com/free-gantt-chart-excel-template
- Smaply personae tool
  https://www.smaply.com/personas.html
- Storyboardthat storyboard tool
  https://www.storyboardthat.com/
- Clip-path tool
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- Favicon generator
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