Project Exam 1

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Introduction

The purpose of this report is to show how I chose to carry out the project with all the knowledge I have acquired so far about Front-end development. I describe the relevant tools, techniques, methods I used while building the microsite for NASA that focus on space technology. I also share some of my thoughts about what measures I chose over others when encountering various challenges on the way.

Body

Planning

The Project Plan I composed may look like the Work Breakdown Structure since the content is arranged in the same way with Phase Title, Activity Title, Activity Description and Activity Sequence. I used the same color pallette like I used on the Microsite to differentiate between each category. The System-Development Life Cycle gave me some inspirstion on how I could set up a clear Project Plan.

Gantt Chart

I simply used the Project Plan as a basis for setting up the Gantt Chart. When all of the data was placed in a chronological order I could easily add the Milestones.

Functional Specification

The Functional Specification I used for this project is the same template I used on the Workflow course. It is easy to fill out and it provide a good description on what to include. I only filled out section 1 – 3 since I feel it cover the most important and necessary information.that the stakeholders and developement team need to interprete with. For the introduction in section 1, I used the the brief I already had from Noroff. Section 2 is mainly an overview of System Actors. Section 3 provides a more detailed overview since that also is the main part of the document. Section 3 consist of Use Cases that describe howthe Main Success Scenario wil look like along with conditions, triggers and actors.Futhermore Mock-up or Wireframes depicts the functionality and design. Then the Functional Requirements are listed before the Field level Specifications wit Form Elements is specified on tables.

Target Audience/research

It is the first time I create Microsite therefor I made some research and found a good definition of what a typical Microsite consists of. This YouTube video "https://www.youtube.com/watch?v=N8q1-k58lAM" by "http://3bugmedia.com" not only provides good facts about Microsite but also compare it with Landing Pages and Squeeze Pages as well. No doubt it was important to have a good grasp of what a Microsite required before I could begin with interaction design.

To find the target audience, I simply started my research on qualitative data that NASA already provides about their audience. I had found children with interests for space science and activities as a potential target audience I could zoom in on.
Although many people today have a genuine interest in space programs, others may have a superficial relationship to it and therefor I needed to limit the user goal to an environment that was suitable to a microsite. I ended up with creating a microsite that encourage children to become more involved in space program activities and an astronaut in the future.

Interaction Design

Personae/Scenario

My personas are created by data that I already knew about my personas and assumptions I came up with while making personas. At this phase I already had made pain points and goals that helped me creating realistic personas, however, I also followed arguments as stated in "About Face p. 62" by Alan C., Robert R., David N., Jason C., and Doug Le Moine, *"The best way to successfully accommodate a variety of users is to design for specific types of individuals with specific needs.* I then grouped the users by tasks and tried to figure out typical behavior and attributes of a person with passion for space science could be. Below you can see all of the pain points that I turned into user goals.

Pain Points

"I can't find news about space program activities around the world on Nasa's webpage for students grade 9-12"

"It should have been easier to find information about time schedule of future rocket launches on NASA's webpage for children."

"Where can I find more information about the Internati al Space Station that is easy for me and other on my age to understand"

"It should have been a page that provided information of rocket launches around the world for kids"

Goals

- I can find news related to space program activities around the world on NASA's microsite ~~for~~ kids
- I can easily find information about future rocket launches on NASA's microsite for kids.
- I can find news about the Internationd Space Station and it is easy for me to understand.
- The microsite provides updated information of rocket launches around the world for kids.

Scenario

To get any benefits of using scenarios and storyboard I ensured that the design was workable, that it described the required interactions and uncovered the error conditions. The method for creating scenarios (Who, What and How) that I learned from the webinar "UX Design: 5 Creating Scenarios and Storyboards" by Chris Nodder, saved me a lot of time creating scenarios. The who that is represented by my personas, about the user behaviors, the what which is based on the pain points and goals and how the solution. The challenge was to stick to the target audience specific goals without being tempted to create other solutions. Finally, I produced some paintings for the storyboard that depict emotion and action based on the scenarios. To ensure my storyboard was understandable, I made an observation of my 12 years old daughter to see how she react on the images.

Navigation/ Affordances

According to "About Face", p. 252, we should always reduce the number of elements in user interfaces without effecting the capabilities of the product. I have therefore excluded the breadcrumb navigation since I only can go one level down with it and thus its purpose doesn't serve any particular benefit for the user when it doesn't have lots of layers.

I included the search bar in my prototype but later I realized that it didn't help the user to search for content which already are easily accessible and obvious to find by just looking at each of the four pages.

To draw users attention to the call to action buttons, I applied a secondary color of orange since it stands out well when it's combined with dark blue colors. The hue and saturation of the orange color persuading the user and guides the user to click on the CTA buttons to read about the related article or section they are looking at on the home page. I also applied hidden affordance to engaging the user to click on images with links to other pages. The images is combined with a hover effect with opacity of 0.5 and background color of #FFF. In addition, I used cursor pointer at all of the clickable elements like the logo and icons. An exception of cursor is the contact form since it already has inputs fields that shows the text mouse pointer. The scroll button that leads you back to the top has a hidden affordance that is triggered when you scroll the page. It stays fixed on the page and disappears when you move back to the top or push it to go back to the top.

Prototype and wireframes

My wireframes are used in the functional specification document since it a good way to display the basic structure of a site, how the content and functionality are laid out and provide a visual understanding for the stakeholders and project team early in a project.

I used Adobe XD to create the prototype since it is very easy and fast to use and it allow me to visualize links between each page.

Graphic design

Design principles

Color

I found a color palette at Adobe Color. “Near Space photography - 20km above ground / real photo” The colors consist of colors from the ozone layer and achieves good contrast with respect to WCAG standards. Both of the color #2B4B8C and #2684BF has have a wide range of value from darkness to lightness while the rest of the colors have more dominance of either lightness or darkness value. Since the ozone layer is a natural phenomenon it also gives the colors a variety of value and hue. They also achieve a harmony of vibrance and neutral and moves from cold to warm temperature. Among the five colors, #2684BF is the blue one which stands out from the other colors in this color palette when it comes to warm temperature. It contains more green color and therefor it must also consist of some yellow color which classifies it as a warm temperature color. I also applied some complementary colors for the logo and the call to action buttons. In order to achieve good persuasion, the buttons have the same orange color like the logo. I thought it would be a good idea to do the same with the key values retrieved from the API that are appended to the span tag with id name “mini-schedule”, the three id’s nested inside the section with class name “time-schedule” and the span tags nested inside the class “iss-pos-style” , but only this time I tried the yellow color from the logo and not the orange. The reason why I did this was to distinguish between signifiers and elements for display only. The only problem was that even the yellow color appeared clear for my vision, I felt it was too risky to use yellow on text with blue background. According to this article “https://nei.nih.gov/health/color_blindness/facts_about”, Blue-yellow color blindness is a rare but not unfamiliar phenomenon that causes people with limited blue cone cells to experience blue color to appear greener. In addition, it becomes more difficult for them to indicate if they’re seeing yellow and red from pink. I therefore chose the same soft orange skin color like the vector graphic of my face which fit nicely to the blue background. The red color is used for the error message for the form validation. Based on what I read on page 253 in “Design For Hackers” by author David Kadavy, “*The red color is often used on websites to alert an error that is critical for the user to see*”.

#081026 **#1A2F59** **#2B4B8C** **#2684BF** **#B5DBF2** **#F2790F**

#F2E527 **#f2cbb5** **#FF0000**

Typography

since NASA already has good experience with which fonts fit into the space environment, to save some time I thought it was wise to take a look to see what they often use on their

website. I chose “Source Sans Pro” for the body text and “Brandon-Grotesque” for the headings. “https://nasa.github.io/nasawds-site/components/typography/”.

Vector Graphics

I made a logo that illustrates a rocket surrounded by a star and an asteroid. The logo consists of an orange and yellow color which gives it a vibrance touch that arouses attention. The idea of using orange color was to take some similarity traits from the images showing rockets with some orange color on it. Earlier on this course I have learned the importance of applying some of the same colors that already exists to achieve better consistency. I also believe the harmony and relation between the images and the navigation elements makes everything more intuitively for the user.

The next graphic I created was a vertical rocket with the American flag. I first painted the rocket before I painted the flag. The goal was to combine the vertical rocket with the data showing upcoming launches/flights.

The last graphic I made was a cartoon of myself. I took a selfie with my Iphone and uploaded the image to Adobe Illustrator. Then I used the paint brush to paint the lines on my face. I used two different layers and locked the image layer. For the second layer I drew a headset with a speaker. Finally, I colored all of the layers before I saved it to svg file. I applied the svg graphic of my face to the div tag named “contact-us-container” on the index page and placed a link tag to it. I think this approach is quicker than drawing a face in the old way if you are not an experienced or skilled artist painter.

Photos

I chose to host almost every image from my own host since most of them are static, but I have also included one static image and dynamic images retrieved from API’s too. I used Adobe Photoshop to crop the images into different aspect ratios since the actual dimensions not always worked well for my page layout. The *“Three rules for creating images”* explained on page 107 in in “*HTML & CSS design and build website*s” by Jon Duckett, are taken into account. The rules ensure that the images are not loaded slow, that the images are not being distorted or stretched and that it is measured in pixels. The static images are taken from NASA’s website

SEO/Content Strategy/WCAG

Search Engine Optimization

To improve SEO on my microsite I literally used meta tag with name attribute “description”, “keywords” and “title”. According to “https://www.wordstream.com/meta-tags”, the title attribute are the most important of all of the meta tags discussed in this article because it are visible to the average user at the top of the browser. The description attribute on the other hand is explains to the search engines what content of the pages is about. Although the

keywords attribute doesn't have any particular effect for SEO as it had before and has been more or less replaced by Google search engine, I have also included it.

Other things worth mentioning about the SEO is the URL structure I made since the search engine easily make the relevant connections between different pages on the microsite and Google consistently deliver relevant results to users when they make a search in the browser. Since I don't have an appropriate domain name just for the microsite a changed the parent folder name from views to the title of the microsite. I also changed the name "schedule-html" to "rocket-launch-schedule.html". Both names make more sense when it comes to relevance.

Apart from that, the micro-page is stuffed with lots of internal links that also improve the search engine ranking. I have also included alt attributes to the image tags which provides relevant description for Google about what the image is about.

Web Content Accessibility Guidelines

Previously while I was introduced WCAG in Web and Communications Technology, Lesson 1.3, I learned that the alt attribute not only is good for SEO, but it also supports screen readers that helps blind and visually impaired people knowing what the image is about.

On the banner image I used a background filter for the text to achieve better readability for average and visually impaired users. Not to mention the background colors to the body text gains high contrast ratio and the buttons stands out with its vibrant color. All of the dynamical data with the very soft orange color also stands out well from the dark blue background.

Content Strategy

My content strategy was to have a main section with frequently updated content on the home page with purpose to motivate users to come back often. I also wanted the most important content to be visible in a few seconds, hence I placed the important sections like contact and upcoming rocket launches on the upper right side inside the sidebar. The logo and banner image with the banner text immediately expose the user about what the microsite has to offer. After the user has seen the banner, they are supposed to grasp the topic heading and then the contact section or opposite. The call to action buttons serv its purpose to guide the user to the contact page, the related article of the "SPACE ACTIVITY UPDATES" or lead them to the get a full overview of the rocket launches. In other words, as quoted from "Don't make me think" p. 99 by Steve Krug "*As quickly and clearly as possible, the Home page needs to answer the four questions I have in my head when I enter a new site for the first time:"* What is this?, What can I do here?, what do they have here?, Why should I be here – and not somewhere else?.

HTML/CSS

HTML

I used the semantic HTML elements from HTML5 for the layout to define the different parts of the micro pages. My structure consists of header, nav, main, aside, article, section, footer. I also included some div tags. I used ID attribute on the HTML elements I wanted to link internal to specific content of another pages. This blog "https://www.orbitmedia.com/blog/internal-linking/" talks about the benefits of using internal linking structure. The internal links is good for SEO by increasing awareness that provides better website ranking, it is good for usability since it guides the visitors to high-converting pages and it used for CTA that encourages people to look into the site.

Even though this is only a microsite I benefited a lot from organize directory structure that I learned in "*HTML & CSS design and build website*s, chapter 4 Links". I have a directory called "Future-Astronats" that holds all of the HTML files and a parent directory "resources" that consist of four other child directories. The "resource" folder contains s CSS folder, a JavaScript folder and image folder.

CSS

I only used one external stylesheet for this project but I also used the same method that is used with SASS and SCSS by dividing the CSS rules into different categories. I didn't use every of them, only "Base" which basically is equivalent to global or default styles and "Module" which are the reusable, modular parts. These two categories helped me keep it organized and easy to go back whenever I needed to make any changes. An example of reusable modules I made are the different color modules I created using classes. I only needed to add the class in the HTML tags without having to set color for each of headings and paragraphs in the box and background color all the time.

A new CSS implementation I did for this assignment was the CSS background-attachment Property on the banner image. I think the image of the space shuttle will stimulate users curiosity and perhaps a feeling of going into space when the whole background image scrolls with the rest of the page.

One of the challenges I encountered while working with CSS was how to change the position of three containers that stood vertically align next to each other. I had one ul tag on the left side and one on the right side and a div tag which was displayed in center. Both of the ul tags has an id attribute that is used to retrieve data from an API. To change the div container from center to left wasn't a big issue, I simply used float: left; and both of the ul tags where placed on right side of the div tag. Although the whole idea was to only display one ul container for table and mobile size and two for desktop, thus I had to come up with another solution. The solution I ended up with was to write another ul container that only displayed below 767px width and set the two others two display none. I then created additional function for retrieving data to the mobile version.

For the responsive layout I used both CSS Media Queries min-with and max with to set the different with for desktop, tablet and mobile screen size width. For the desktop I applied a min width from 769px with body width of 90%, min width of 1024px and max width 1366px. The for the tablet styles I used max width of 767px width 100% width for the body while for

the mobile styles I used max width of 530px. For some of the modules and font size I have used other media queries to customize the content when it began to occupy too much space. For instance the headings and boxes such as the box that contain info about the company on the contact page. To check that every page on the microsite where mobile friendly and the responsiveness score was approved, I used often the Google tool.
"https://search.google.com/test/mobile-friendly"

JavaScript

I used API to display podcasts, data showing the International Space Stations position, updated schedule plan for rocket launches and as mentioned above, images from API.

Closure and returning functions. In "Learning JavaScript Design Patterns" by author Addy Osmani, explains benefits of using the Singleton Patterns on page 39. It hides the implementation code from the global namespace and provide a single access for functions. I found the Singleton Patterns very useful since it provides the function scope that makes it possible to coordinate all of the API's with one object function. Not only does it reduce the needs for global variables which can leads to name collisions, I can also manipulate the DOM with each of the API's in closure manner and return them once at the end. I have nested an async function inside the Singleton function that ensures the program to run as normal even if some of the requests from the API's hasn't returned from the server in time before the next API in the queue requires a request. This is a good example of a higher-order functions.

I have three functions (Rocketlaunch, RocketlaunchMobile and minischedule) that shared a lot of duplicate codes in the beginning, so I used the extract method to refactor and avoid repeating myself by rewriting the same logic again. The parameter named "data" in the function called "scheduleInfo" creates a variable that can be reused in the two other functions that retrieve key values from the same API.

One of the things that confused me a lot was the difference between "Functional Declaration (Global Function)" and "Named and/or Anonymous Functional Expressions".
Although after I read this article "https://www.w3.org/wiki/JavaScript_best_practices" by W3C Wiki, posted 23 May 2015, everything became more obvious for me of what to be aware of when writing functions. Avoid using global function names because "*every JavaScript file included in the page runs in the same scope. If you have global variables or functions in your code, scripts included after yours that contain the same variable and function names will overwrite your variables/functions.".* Like I did with the API's, I collected all of the common Global Functions and wrapped them in a single closure function. This is the code I made us of <W3C Wiki> (<23 May 2015>) <Avoid globals>

```
(<myNameSpace = function(){
  var current = null;
  function init(){...}
  function change(){...}
  function verify(){...}
  return{
    init:init,
```

set:change
}
}();>) [<JavaScript>]. “https://www.w3.org/wiki/JavaScript_best_practices”.

Another feature I found beneficial was the export and import statement. As explained in this article *“*https://medium.com/@etherealm/named-export-vs-default-export-in-es6-affb483a0910*”* posted Mar 17, 2018 by Alankar Anand, “*ES6 provides us to import a module and use it in other files*”. In the same way I applied the named export statement to export functions from two JS files to other JS files. The good thing about this is that not only was I exempt from rewrite the common functions like hamburger menu to all of the HTML pages but I could also apply only the functions that was required for specific HTML pages instead of applying all of the functions to every HTML page.

After I created the “utilitiesFunctions” that kept all the functions, my next concerns were how to prevent the propagation from bubbling through all of the events that are imported from the utility function. I therefor added the stopPropagation() method to each of the events listeners on every page.

Like avoiding global functions and global variable, I have learned that the global let instead of var is a better practice when we don’t want it to be attached to the window object in the browser like var does. In this post “https://tylermcginnis.com/var-let-const/” by Tyler McGinnis, the difference of var, let and const is explained briefly. Simply explained, let and const is a better way to declare a variable since they both are block scoped and not function scoped like var. This simply means that I don’t need to be concerned of overwriting a variable inside the function scope when applying const. Despite var can be reassigned outside the function scope, it still has the advantage when we want to access the variable inside the function scope. The const variable can’t be reassign but with let we still can do. I believe the variable choice I made for my scenario is right since it all depend on the programming requirement we make.

Conclusion

Throughout the whole project, efficiency and productivity have been the key points that I have focused on. At the same time, I have tried to maintain good functionality on the site without the expense of saving time while working with different issues. By that that I mean that if I first learn to avoid repeating myself in doing things several times where it is not necessary to do so, I will become a more efficient Front-end developer.

Microsite: http://fronted.no/Noroff/Project_Exam_1/Future-Astronauts/index.html

GitHub repository: https://github.com/jorgenaa/Project-Exam-1

Reference List:

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- *Website: http://open-notify.org , (API)*
- *Website: https://github.com/r-spacex/SpaceX-API/wiki , (SpaceX, API)*