

Clement Dada

USER CENTERED WEB DESIGN AND DEVELOPMENT

Degree Programme in Innovative Business Services  
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Dada, Clement

Satakunnan ammattikorkeakoulu, Satakunta University of Applied Sciences

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Supervisor: Jeffrey, Salahub

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## PURPOSE:

This thesis aim to create and solve a website or web interface design issue for all kind of audiences, either experienced or not experienced on the web. A simple way to create a website which everyone can use and interact with, and without any problems. Responsive web design is now a big priority, now a days people do not usually visit a web site on their desktop, and 95% of the time a site is visited via a smartphone or a tablet, which makes it a priority for every web designer to keep responsiveness of website in mind.

## METHODS:

The research focused on designing and developing a website to create a better understanding for both ends (designer and users) on how to create a unique experience for everyone. I checked out different websites and gathered relevant information to help me through creating a website from scratch.

There were thousands of websites talking about web design and development, but Awwward.com and CSS-Tricks.com, both sites were very resourceful and helping in guiding me towards my goals.

The list of software I have used during my thesis are Inkscape for creating SVG images, NetBeans a coding editor, Gimp2 for editor photos, Pencil a wire framing tool, Xampp for testing site locally, FileZilla an ftp client and Notepad++ another code editor, and other tools I used are pencil, paper and eraser, The browser site was tested on are Internet Explorer, Google Chrome, Safari and Firefox and also Opera.

## THEORETICAL FRAMEWORK

The theory chapter of this thesis tells about the Web design and development process and the practise by web designers and developers.

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## 1. INTRODUCTION

Due to the increase in internet usage, many people are now using internet as a new source of sharing information, for example: CV's are available online and can be easily share or viewed without restrictions and also many businesses are now available online to make products and services available for their customers. With the availability of social network sites like Facebook, twitter, LinkedIn and Google plus, information can now be easily stored and shared online.

CMS like WordPress and Joomla makes it easy and simple to get a website up and running with the availability of themes to download for free or paid, but you do not always get what you want with those, the themes are designed for many people to use not just for one person. The ability to edit a themes or to create one from scratch is always a good way. Otherwise it will be expensive to hire someone to build a website from the scratch and also it depends on what you want or what you need.

And the other most important part is to make it responsive, many websites are still not responsive, this makes the site difficult to view for users with mobile devices, some website comes up with the ability to redirect users to a mobile site, but it takes much effort to keep it updated, I do not see this a better way to go, that's why it is best having a single responsive site, that responds to all platforms or devices, than two different websites. Other ways to get a website online are Wix.com, Weebly.com and other similar sites, that gives the ability to create a website with a simple drag and drop features. The customization options are still limited and there are no ways you can customize the site to how you want it to look. To achieve this you need to find a web designer to discuss with and create what you want.

# 1 WEB DESIGN

Web design is the process of creating a good website to share or present your content or information on the internet. Many process to be followed to get the right site for the right person or for a company. All the UI and UX design is all included to create a good interaction for a website, which will make the users or the visitors to feel good and relax while visiting the page. Whenever someone tells me they need a website, the first thing I ask is what is the site for? And who are your audience, website should be built with a requirements and for a purpose. Web design can be divided into two part, the first part is User interface and the other is User experience design, below will be more details.

“Designing a web site needs careful thinking and planning”. (W3school, 2015)

“Here is a standard process that was put together using examples from around the Web as well as my own experience.” (Reimer Luke, 2014)

“Often many individuals will work in teams covering different aspects of the design process, although some designers will cover them all.” (Wikipedia, 2012)

## **Web Design in Business**

Designing a good website as a business is very important, since products and services are available online, web designing comes in to help so every business can have the own unique feel to represent their business, the right kind of website for the right business after researching and brainstorming to come up with a perfect look and feel for their customer. They will be able to form and create a better relationship with their customers, if they have a very well built site.

Mobile devices are the future, so it is good for businesses to have a mobile friendly website, most users are willing to buy products and services if they get a good experience, that’s why it is important to make a business website mobile optimized so they will be able to access the services no matter where they are or which browser they are using.

When I am buying a product or a service, I always test the site on desktop, tablets and smartphones to see how good the website is on those devices and it will help me in making my decision if I should buy the product/service or not, I want to have access to what I have bought 24/7, because I have paid for it and I expect it to be available always. nobody will want to buy a service which will be limited to only desktop only, the companies should do the heavy lifting to give their customers a more smooth and simple experience.

“Why Your Business Needs a Responsive Website before 2014.” (Steimle Joshua, 2013)

“These days, web designing industry became an important factor in promoting a business or marketing a product.” (Raging creations, 2015)

“It takes just 2.6 seconds from the time a page loads for a person's eyes to focus on a specific element on it. From a design perspective, this means that whatever your visitors are looking at first better be good.” (Fallon Nicole, 2014)

## 1.1 User Interface Design

User interface design is the state and look and feel of a website, from colors to pixels, text sizes and buttons. The goal is to create a very simple and effect feel on a website that the users or the visitors will understand. Something that will let them stay longer on the site and they will let them visit the site again in the future. Everybody has a story to tell, but with a good user interface for a company or an organization, will help them to tell a more clear and effective story.

The brand is needed to be determine to be able to create unique and make the brand stand out, and many process are needed to be made and with consideration on colors and the layout is needed to be clear, simple and refreshing.

Always something that goes with the brand or the product, something that defines the company as a whole. The color, background and the layout must match the audience requirement and feelings.

“User Interface (UI) Design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions” (Usability, 2015)

## 1.2 User Experience Design

User experience design is the process or the idea of creating a user friendly experience, which will make the life of the users or site visitors easier by helping them in getting task and information fast and easy. The main idea behind this is to have the right content on the right spot and how information or feedback is giving back to the users no matter what device they are using. Some of the ways to get a site UX right are:

- **Researching**  
Research is needed to identify the problem and to generate a better solution for it, what steps others have followed and what can be improved to make it to the next level.
- **Prototype**  
This is needed if the site is going to be new or redesigned, and before writing any line of code, it good to get the design out with a prototype design to be tested.
- **User Testing and User Feedback**  
Users site users or customers should be contacted and to be paid for their time to site done and test out the new design and give their honest feedback and opinion about the site.

“User experience (UX) focuses on having a deep understanding of users, what they need, what they value, their abilities, and also their limitations.” (Usability, 2015)



## 2 WEB DESIGN PROCESS

The aim of this process is to have a structure or an idea of what the project is all about, by planning, getting software's and tools which is needed to complete the project. The list below shows what I will go about designing a website for a client if I was asked in the future and yes it is similar to all other designer process, but this is a modified one by me.

“Almost every Web designer can attest that much of their work is repetitive. We find ourselves completing the same tasks, even if slightly modified, over and over for every Web project.” (Reimer Luke, 2011)

### 2.1 Project Planning and Outlines

Highlighting the importance of the project and gathering tools and software's you will need in completing the project. Planning and scheduling your time to know what should be done from one day to the other.

### 2.2 Research and Information

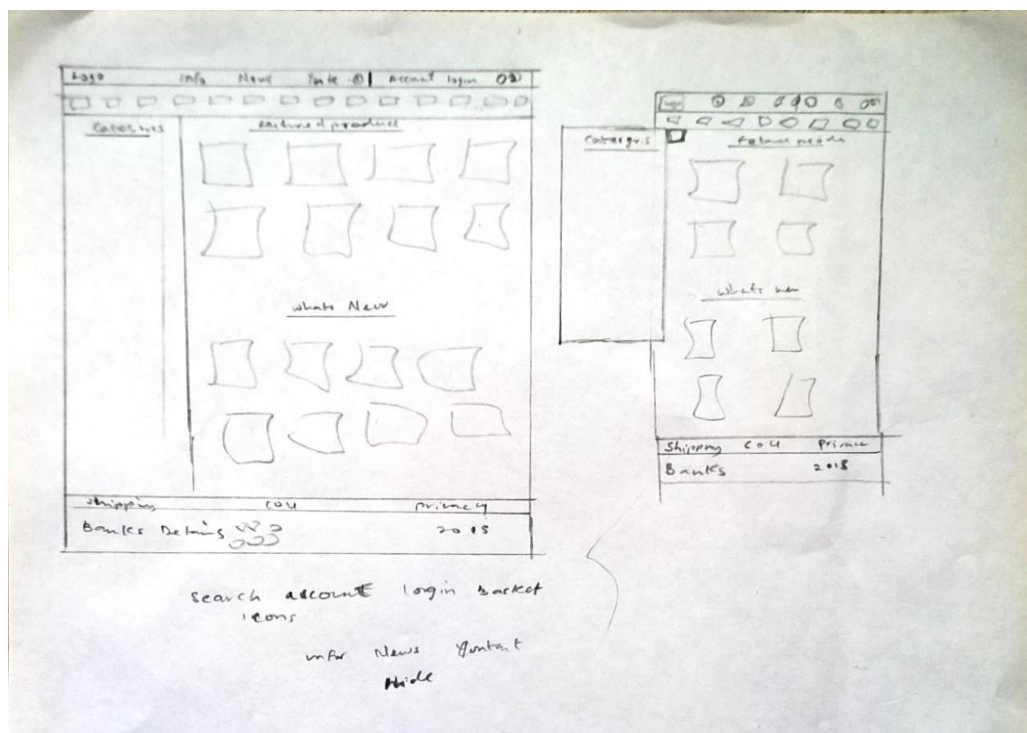
Getting the information about the person or the company you are building their website, by outlining their area and finding out who are their audience, based on the information collected you will be have the best approach to follow and what are the key important areas which you should focus on or maybe also by talking to their customers to get an idea what they will want from the site. This can be done in any kind of way, for example: if they have a site already, it is possible to create an online survey on the

existing site and asked the users some specific questions on how they are finding the old site, what is missing and what should be improved.

### 2.3 Brainstorming, Sketching, review and corrections

Brainstorming after research and information collected from the client and maybe their customers is key to the brainstorming session. This gives you a better understand in coming up with a design that is needed or that suit the clients business. After check similar site of those who are in same field with your client, you are then full of thoughts and information which will help to progress further, with pencil and paper ready, you can craft out something which you think will suit your client.

Below is a sketch example I made for an ecommerce site.



After the brainstorming and sketching is done, now is the time for review of the sketch and changing and making correction to best suit for your client. Normally more than one sketch is ok, but through all the drawings, it could be merged into one after all the consideration and thinking.

## 2.4 Wireframes review and corrections

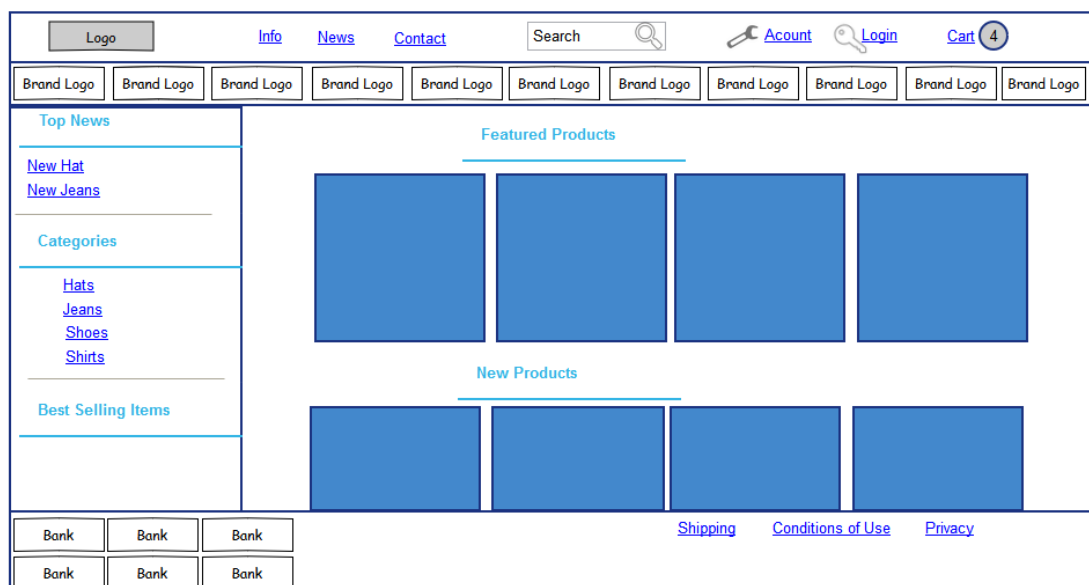
Wire frame is a tool that we can use to communicate with clients, something we could show to a clients that will mostly be the final product after the website is completed. Wire frame is used to show all the details and information of all the page elements and structures that can be still changes, updates or reviews that can also save time and money for you as a designer and for your clients.

Wire framing is done and then it will be reviewed to get it to a more specific area or balance to what you have in mind, going through the site own or your client to get their take on the idea, for example what they like and what they do not and what is needed to be change to get it to perfection.

I always like to know what the client want and try to get it to their taste and also on the research I made based on their company or products, services and also their target group.

All what I listed is always important to create a good website, putting the users in mind, not just yourself and your clients. After the feedback from your client, now is the time to make more correction to get it to perfection and make your client happy about the job you are doing for them.

Below is an example of a wireframe I made for an ecommerce site



- Wire framing Tools

Many wire framing tools available, some are paid and some are free (open source software), I use Pencil, which is an open source software. Adobe fireworks, Visio, InDesign and some other like Photoshop and Inkscape can be used for designing, but the most used are Fireworks and InDesign.

## 2.5 Adding Specifications and Finalizing

Putting numbers or should I say pixels on the layout will make it more perfect and getting it ready for styling, knowing how much pixels an element should have is always good, from colors, backgrounds, music's, videos, buttons and icons is all needed to be set, I always like to get the clients ideas about all those, but if they do not have any ideas, I will come up with one for the project, sometimes background images might not be needed, but depending on the site you are building, you will need to follow the best approach for that business to get the best out of the site as a whole.

For example: let's say I am building a site for a company that sells mobile phones, computers and all others accessories, my first aim to check the similar companies website to have an idea or a format I should follow, and come up with a better solution to differentiate the new site I am building from the rest, create a unique and simple website to showcase the products, make things easier for their customers.

### Examples

1. **Body** - 100% width, Arial normal fontsize 100%
2. **Header** - background color #fff and height auto and width 100%
3. **Nav** - width 50%, height auto, color #000 arial bold 110%
4. **Main** - width 90%, height 100%, margin 0 auto,
5. **Img** - width 70%, height 35%, display block
6. **Content** - fontstyle inherit from body, fontsize 106%
7. **Footer** - width 100%, height 30%,|

## 2.6 Creating Final Visual Mockup

Mockup is a kind of a final site look, which will have all the important elements, colors, backgrounds, images, icons, logo, typography and buttons placed in their right position with their right colors, This is the final set that is needed to be done, before the coding begins, all the marked or choosing colors and backgrounds will now be applied to the wireframe to bring it to life. It is important to get things right, from colors, backgrounds on all elements.

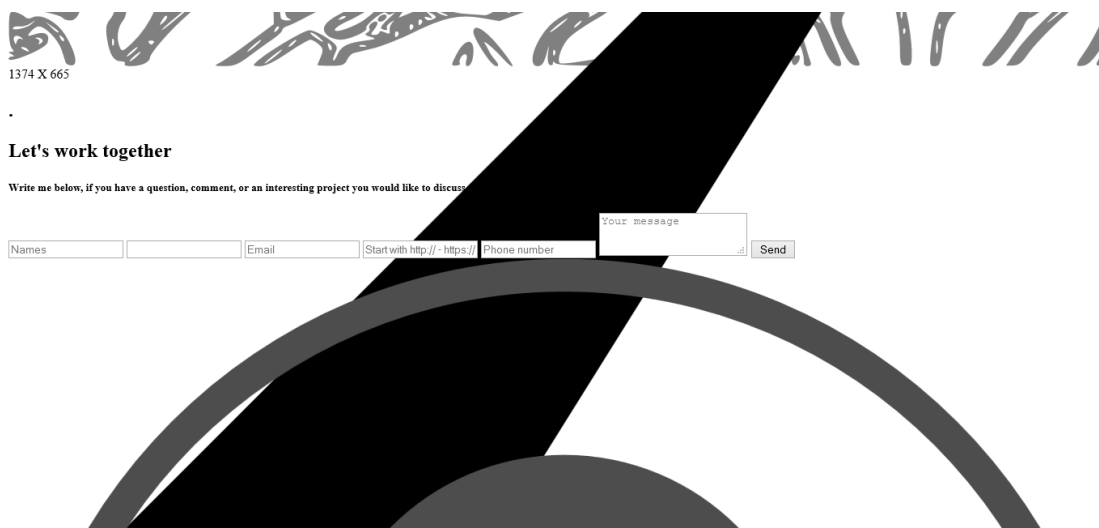
Depending on what kind of website I am building, the placing of element will be different, and spacing will create a unique feel on the site. Every single detail and information is needed to be added at this point to know how the site will look at the after coding, that's why everything has to be set.

## 2.7 Markup and Stylesheet Languages

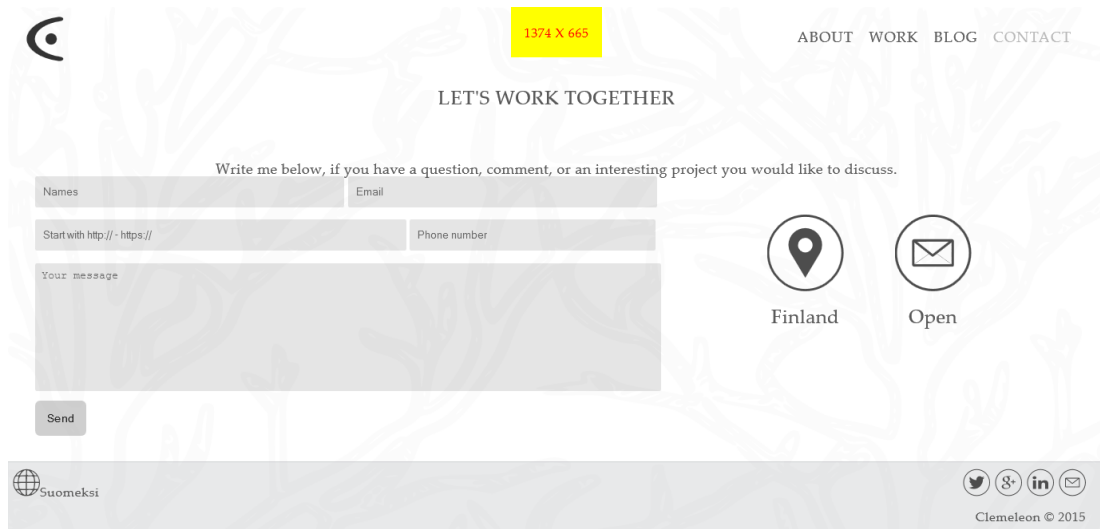
Markup and Stylesheet are important, without both you cannot create any design at all, no matter how much you create a wire frame and mockup, without this two languages parts, you can get anywhere with your design. HTML and CSS is the backbone to design in general, you cannot use one of them without the other, they both work together to create a beautiful website. HTML hold the content and CSS move the elements and content to where you want them to be on the page.

### Examples

Below is an example of an HTML page without CSS



Below is an example of an HTML page with CSS



### 2.7.1 Hypertext Markup Language

Hypertext is the way of linking objects together over the internet, so if a link is clicked, it can show or display the other page which linked was clicked. HTML is a computer language which is used on the web and only recognized on the internet, it only used to define the content over the internet which a web browser can read and process, by recognizing and understanding the HTML tags. HTML has come a long way since it was first introduced in 1990, HTML is not a programming language, it is a markup language and it is used to hold and link all content on the web page together.

`<!DOCTYPE html>` is used to define the use of HTML5 which is the new and improved markup language update, bringing some new features and new tags such as `<header>`, `<main>`, `<section>`, `<aside>`, `<footer>`, `<video>`, `<article>`, `<details>`, `<dialog>`, `<figure>`, `<nav>`, `<div>`, `<input>`, `<select>`, `<summary>` and much more.

“The most interesting new elements are:

New semantic elements like `<header>`, `<footer>`, `<article>`, and `<section>`.

New form control attributes like number, date, time, calendar, and range.

New graphic elements: `<svg>` and `<canvas>`.

New multimedia elements: `<audio>` and `<video>`.” (W3school, 2015)

The tags attribute like IDs and Classes gives you more power on how the generalize some element or define a single element from the rest,

- ID is the best way to define a single element, because ID is always unique and a certain ID name can only be used once on a page, every elements will have their own unique ID.
- Classes is a way to group multiple element together, which means many elements can have the same classes and difficult to know how many classes a single element can have, but based on the source I found, It depend on the browser how many classes it will allow on a single HTML document or a single element on the page.

“You are only limited by the maximum length of an (X)HTML attribute's value” (Eagar Matthew, 2010)

### 2.7.2 Cascading Style Sheets

CSS is a way to style an HTML elements to your linking, it is also a standalone presentation which allow you to present your site how you want, it can control everything on a website, from font, spacing, colors and placing of an element to a where you like on the page. In other words CSS is a way to disconnect content from an HTML document in a good way, giving you the ability to change, tweak, update and edit and transform without making any changes to the content itself.

The three way to use CSS with an HTML document are: Inline, Internal and External CSS.

- INLINE CSS is when the CSS is used directly inside the HTML tags and it will only affect that single element, this is not the best practice, it should be avoided when possible, but it can be used when you are controlling an element through JavaScript, which is understandable.

- INTERNAL CSS is when style is written directly inside the HEAD section within the <style> tag element in an HTML document, this allow you to target multiple element for styling, but still not the best way to do it, similar to the inline CSS and looks clumsy.
- EXTERNAL CSS is a separated CSS file with the extension of .CSS which will be linked in the HEAD section of an HTML document and communicate with the tags, ids and classes on the website. It looks like the internal CSS, but on its own in a separate document file which makes your code simple and easy to read, this is the best option and best practice everyone should follow.

The External CSS is the way to go and that's what most web designers and developers use on a regular basis, but sometimes inline CSS, and that depends on if the HTML tag directly through PHP, and other times it can be done through JavaScript.

“Styling can be added to HTML elements in 3 ways: - 1: Inline - using a style attribute in HTML elements, 2: Internal - using a <style> element in the HTML <head> section and 3: External - using one or more external CSS files” (W3school)

## **SASS**

Half way into my project I discovered SASS and I have been using it since then in my project, SASS made my CSS code more easy and simple to write and to read, I was able to find mistake very easily.

Syntactically Awesome Stylesheets is a CSS preprocessor which will allow you to write few lines of code and it will generate all the necessary CSS code needed with the help of mixin, variables, Import, partials and much more. It makes writing CSS code faster and better, child's element CSS code can be nested within their parents, and with the help of SASS you will not forget any browser's prefixes again. **Note:** SASS need Ruby to be installed to work.

Below is the example of SASS mixin and how to use it and also nested code.

### **Mixining looks like this**

```
@mixin radius($value) {
```



```
-webkit-border-radius: $value;
  -moz-border-radius: $value;
  -ms-border-radius: $value;
  border-radius: $value;
}
```

**And can be called like this below**

```
.boxes { @include radius(40px); }
```

**And CSS output will look like this**

```
.boxes {
  -webkit-border-radius: 40px;
  -moz-border-radius: 40px;
  -ms-border-radius: 40px;
  border-radius: 40px;
}
```

**And nested code will look like this**

```
li{
  margin: 0;
  a{display: block;}
}
```

The li tag is the parent and a tag is the child, but the output in CSS will be generated separately and will look like this.

```
li{ margin: 0; }
a{display: block;}
```

**Import** will allow you to import any files or font into your project, for example if you want to use Google font, this is one of the way to add it into your project.

**Partials** files are SASS files that start with an underscore, this less SASSA knows that the code within the partials files will be added to the project and SASS will not create a separate CSS files for the SASS file with an underscore in the beginning. This way

a different SASS files can be create for every single page in the project, making the code easier to read.

In my project I have a separate SASS files for the Home, About, Contact and Project pages.

“I was a reluctant believer in Sass. I write stylesheets by hand! I don’t need help! And I certainly don’t want to add extra complexity to my workflow. Go away! That was the thinking anyway. But the reality is that Sass (and other CSS preprocessors) can be a powerful ally—a tool that any style-crafter can easily insert into their daily work.”  
(Cederholm Dan, 2013)

### 2.7.3 Elements Layout and Positions

All elements positioning means something and the header is always at the top of the page and the footer at the bottom and the content in the middle, having all the important first impression items, from logos to navigations, this is what is needed always by the users, to know which site they are viewing and to be able to get around the site without any problems and the footer content some other links which are not so relevant to the site visitors and other kind of information. It is always good idea to have all the links at the top, but depending on what the link is for, or where it links too, if is not so important link, then it could be added anywhere on the page even at the bottom of the page. Laying out all the element requires time and effort to be able to get it right and make it nice and simple, but depending on how the information is needed by the user or how the information is important to the site owner to notify the site visitors, then it will be place in a visible area. There can be banners, slideshows and popup notifications and much more, which can be placed right in the viewport to alert the visitors on important information.

## 2.8 Visual layouts and audios

This is all the media content or elements on the page, from the music to the colors, background images and all other stuff to make the website presentable or viewable for the users. Something interesting which people can connect with. Long staying visitor always have something on the page which makes them want to stay longer. Most site visit never spend many few seconds on a site and if you do not give them the reason to stay longer, they will leave immediately without even checking out the rest of the content, so it is important to have something interesting like background/images, logo colors and audios.

### 2.8.1 Backgrounds

Background is the HTML page background or an element background, which can be for example: colors, images or videos, this can be used depend on the designer or the request from the site owner, background can be placed on any elements on the page. I have most often use images for background which is not normal JPEG, PNG or GIF. I have just started getting into SVG vector images, which are better for icons and buttons, it keeps the quality no matter the size added to it.

SVG (Scalable Vector Graphic) images are XML vector graphic based images that can be created with a vector editor software like Photoshop, adobe illustrator, Inkscape or other SVG editor software, I use Inkscape, because it is free open source software and it does a good job, and also I have some few tools to remove all un-necessary data from the file before using it on the web, SVG images are small and can be any size on an element, for example: if I created an SVG background at 16x16 and I want to have it on the website to be 600x600 in size, all I need to do is use CSS to set it to the size I wanted and SVG file will keep the resolution and will not loss quality even if I increased the size more than the actual size, this is interesting and it happens because vectors are basically vector graphic which used random number and text, and the number can be multiple to change the shape, which can be done within an SVG editor and the browser read all the text and numbers into shapes.

## Examples

- Below is the SVG icon example with raw data

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!-- Created with Inkscape (http://www.inkscape.org/) -->
<svg
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns="http://www.w3.org/2000/svg" height="16" viewBox="0 0 16 16" width="16"
    version="1.1"
    xmlns:cc="http://creativecommons.org/ns#"
    xmlns:dc="http://purl.org/dc/elements/1.1/">
  <path style="color-rendering:auto;text-decoration-color:#000000;color:#000000;iso-
    lation:auto;mix-blend-mode:normal;shape-rendering:auto;solid-
    color:#000000;block-progression:tb;text-decoration-line:none;text-decoration-
    style:solid;image-rendering:auto;white-space:normal;text-indent:0;text-trans-
    form:none" d="m2.8379 0c-1.568 0-2.8379 1.2699-2.8379 2.8379v10.324c0 1.568
    1.2699 2.838 2.8379 2.838h10.324c1.568 0 2.838-1.27 2.838-2.838v-10.324c0-
    1.5681-1.27-2.838-2.838-2.838h-10.324zm0 0.54102h10.324c1.277 0 2.297 1.0197
    2.297 2.2969v10.324c0 1.277-1.02 2.297-2.297 2.297h-10.324c-1.2773 0-2.297-1.02-
    2.297-2.29710.00002-10.324c0-1.2773 1.0197-2.297 2.2969-2.297zm11.031
    0.54688l-11.738 6.9004 11.726 6.9237-7.3258-6.9179 7.3378-6.9062z"
    fill="#4d4d4d"/>
</svg>
```

- Below is how the browser reads the SVG file



The `<path />` tag is the one which holds the icon and everything within it is the icon properties, from colors to shapes and I could define many values through the `<svg>` tag `viewBox`, `height`, `width` and much more, this will content the path tag to be in 100% size. SVG be used on the web in many ways, by putting the file directly on the HTML document, through CSS as a background or through and image tag ``, SVG can also be used as a sprite image, which I will write

more about below. The SVG is alternatively replacing PNG and JPG images, because it is a much better solution, but most of the time SVG is used, there has to be a fallback for the old browsers, a modern browser has no problem with SVG for example: IE 9 upward support SVG, the site visitors who uses IE 8 and downward will have a PNG or JPG image as a fallback.

- **Sprite Background Images**

Sprite image is a multiple images in one image file, it can be stack horizontally or vertically and with the background position in CSS we can position it to show any of the images, it can be from two images to 100 or more images, loading images one by one will use more resources, but with sprite image, you can load just one image, which contain multiple images, so the request will be made once. for example if I have 5 images and they are all separate, the request will be made 5 times for each images and same 5 images with sprite image will be requested once and all the 5 images can be displayed with background positions, I came across a way to make sprite image responsive without overlapping or showing the other images, but I tweak it to my own best way, which has been working well for me, with the support of JavaScript, I kept height of the image always to the window height so that the image can keep it size and keep the position in-view at all times without revealing the other images.

Many websites offers free images converter to sprite image and will also generate all the necessary code needed to display each images.

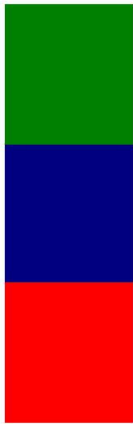
“CSS Sprites are a means of combining multiple images into a single image file for use on a website, to help with performance.” (Coyier Chris, 2009)

“At one time or another, you may have found yourself wanting to use sprites in your responsive website design. While at first this may seem like a very simple task, in reality it’s a little more difficult of a challenge. It can, however, be done. Here’s how! This trick is fully supported by all modern browsers other than IE 8 and earlier, in which the image resizing aspect will not work properly, though it will not break completely.” (Johnson Brian, 2013)

### Example Horizontal Sprite Images



### Example Vertical Sprite Images



## 2.8.2 Graphical Representation

graphical representation for me is the images, photos, icons and logo, something that represent your site and something that shows your identity, everything has to connect together, from the color of the background to the color of the logo and also icons and they all have to be simple and clear. You can come up with any style you want, like box-shadows and much more, but nowadays, many designers are going for a more flat simple design, with maybe 2 colors max, something some designers call metro design. Flat UI element that looks nice and simple.

“SVG is an image format for vector graphics. It literally means Scalable Vector Graphics.” (Coyier Chris, 2013)

Below is the example of SVG icons

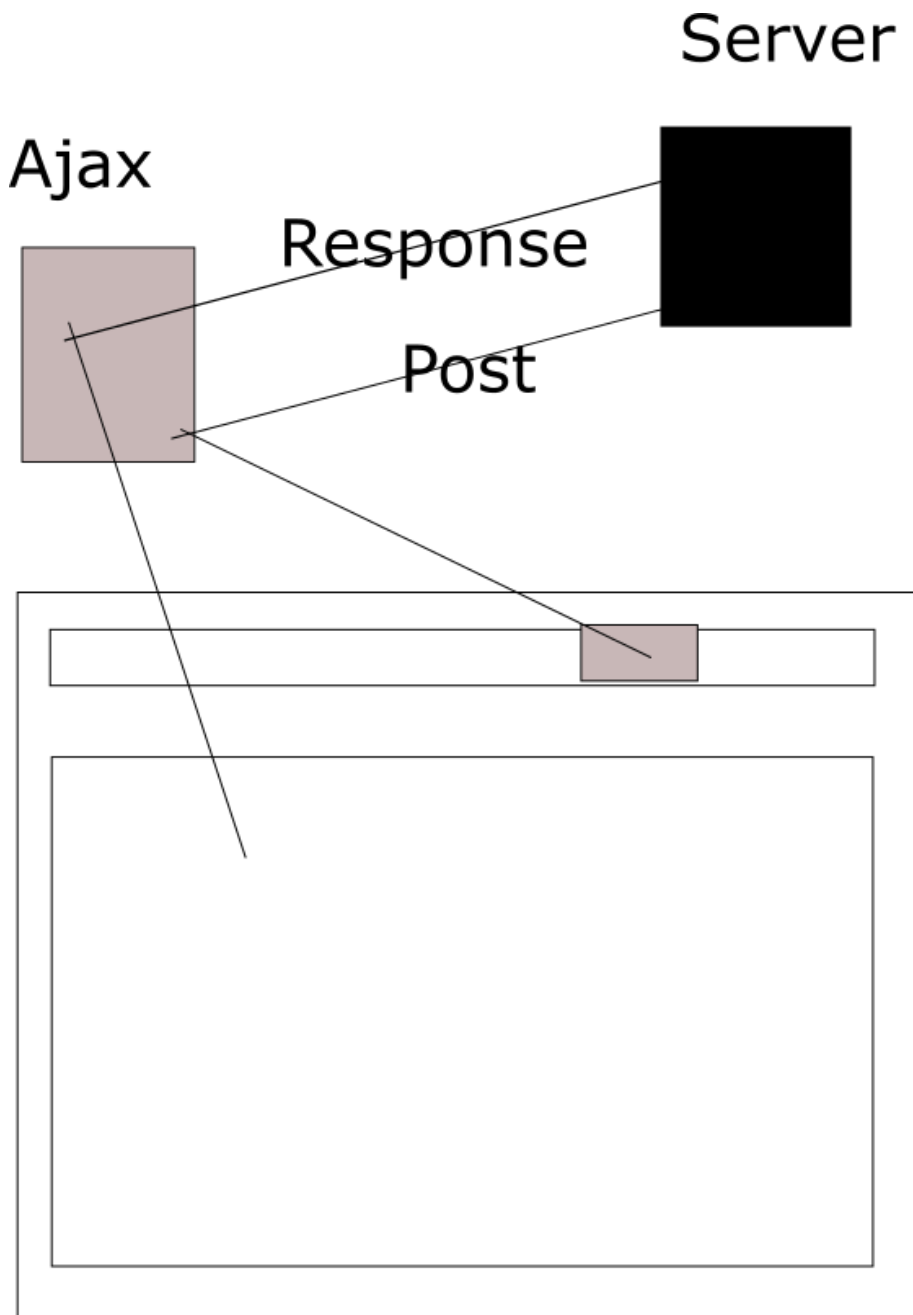


### 2.8.3 Navigations and controls

Navigations and controls are important on every site, is always good to give the visitors the chance to navigate and also the power to control what they do on the site, giving them the chance to view what they want anytime they want and not forcing them to go step by step to your pages, if you have music playing on your site, give the visitors the chance to stop, pause, fast-forward and rewind and the chance to able to close the music app so it would not load up on their next visit. Control is important to visitors and I always like to give control to the person using the site to do what they want to do and view what they want to view. If there is a popup menu, give them the chance to stop it from coming up on every refresh, visitors do not want to see the same popup all the time or the same notification all the time, just for refreshing the page or from going to the next page. Using cookie or HTML5 storage is a good idea, but I like the

HTML5 storage better than cookie, even though it will be deleted when cookies are cleared too, the best way to have the site remember the user settings is by using MYSQL database, but this is not easy if you are having many visitors to your site. There are many other ways to store information for example: a flat database text file type of database to store information of the users to remember what they have selected, this is not the best way but it can be used if you do not have so much database space from your hosting.

Below is the diagram that shows how AJAX works behind the scene.





## 2.8.4 Typography

Typography is all about making your page content clean and easy to read, it does not matter in what format you have your text, as long as it clear and simple to read, surely that is something that will keep the site visitors stay and read your content. Text color, font size, font-style, line-height and letter spacing, all this list are important when it comes to making a user's life easier to give them a better experience on your site, so they will be able to read and understand all the content on the page.

“Typography is the art and technique of arranging type to make written language readable and beautiful.” (Wikipedia, 2014).

**Text color:** The color should not be the same with the background color, any dark color will be looking good on a white background and some few light colors too will look ok, like a gray color on a white background can something look good. Good contrast is what make a website standout and also make the text easy on the eyes.

**Font-Size:** Is also important, if the text is not having the right size, meaning not too small or too big. The perfect size on everything screen size is always good things and is good something to use percentages or pixels or rem and much more, but I prefer percentages, because it can scale accordingly to the screen size and not be too big or too small, I do not use 100% font size, it will not look good on all devices, always I go more higher than 100% on the desktop to make it get the right text size on all other screen sizes.

**Font-Style:** Many popular fonts are save to use, but some of those fonts are not pretty on the eyes. There is a chance to use custom fonts, for example: Google fonts and some other fonts can be found over the internet, some are free to use and some you have to pay for them. I like to use some of the regular, popular fonts.

Line-height: is the property that controls the space between lines of text to make it looks nice and better to view, the default value for line-height is always set, but I always like to set my own custom line-height to my taste, something which work well with the font-style I selected.

Letter spacing: has a default value, but something times depending on the font-style, the letter spacing might not be enough and a custom value is needed to be set to make the letter more spaced out.

For me I put all those point into consideration before choosing the color of the text and also the background color will decided the text color, the point here is to make the text easy and clear to read, so that what every design or front-end developer should have in mind.

“First impressions are lasting impressions. Whether you realize it or not, your typography helps to create an experience for users before they’ve even read a word or clicked a button. Typography has the potential to go beyond merely telling a story — it shows the user who is behind the website and what you’re about.” (Haack Shavaughn, 2013)

### 2.8.5 Music, Audio and Sound

Audio on website is not good practice, but it does not mean that music/audio/sound cannot be used, if sound is used, it has to be for a propose, for example if I was creating a website of a band or a music shop, then it will be a good idea to use music on their site, because users already knows and will expect music to play.

If music is used on a site which is not a music band or music shop site, then it has to be for a reason and users must be giving the control of if they want to listen to the music or not and control to stop, pause and skip.

“Sound: a formidable and very interesting resource that has never had much of a place on the Web. Landing on a website from the musical territory and being unexpectedly hit with a blast of sound is a common negative criticism. In many places the music is annoying, and how hard it often is to find the icon to stop it!” (Awwwards, 2013)

### 3 RESPONSIVE DESIGN

Responsive design is a way of scaling a website to any device screen without any problems or also can be a website that adapt to the device screen to give the user the best viewing experience as possible, it makes website viewable in a satisfying way on any device making it compact to view, element will be moved around to fit the screen and make it viewable to the particle viewing screen. Media queries help in carrying out this task, but it is way difficult to do, since there are many devices with different screen sizes and resolutions, small devices comes with the same resolution on a desktop, so one of the difficult part in this is that we can only target the resolution which will calculate the browser viewport or maybe the windows screen which can often change if the browsers resizes.

“One way to create a responsive design, is to create it yourself.” (W3School, 2015)

#### 3.1 Media Queries

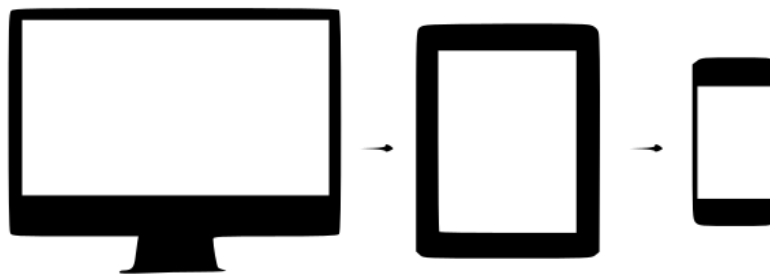
Media queries are a filter tools in CSS which allow an element style to be changed depending on the viewing device screen size or resolution, it will adapt to the device screen without losing the quality of the website, it keeps important information on the screen and hide the other information and can be shown by clicking an element on the page.

“If you think responsive design is simple, I feel bad for you son. We got 99 viewports, but the iPhone's just one.” (Brewer Josh, 2010)

“Day by day, the number of devices, platforms, and browsers that need to work with your site grows. Responsive web design represents a fundamental shift in how we’ll build websites for the decade to come” (Jeffrey Veen 2014)

### 3.2 Desktop First Approach

The desktop first approach is the media query control which starts from big screen to small screen devices, sometimes it can be called from up to down. The design starts from the desktop and go all the way down to the mobile, this is a more difficult approach, because when things are bigger it gets more difficult to make them smaller, but I have used this approach for a while and I might still use it something day depending on the project. This method is not a bad method it just has its ups and downs and it gets a bit challenging.

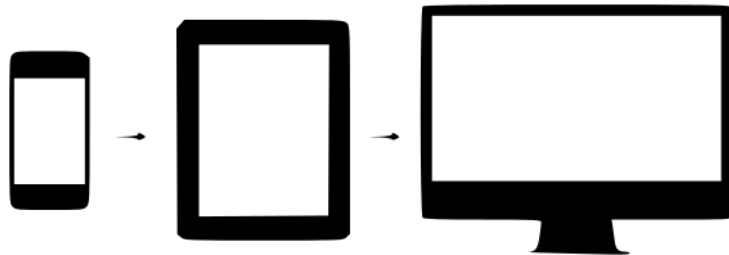


“Your large screen styles are in your regular screen CSS and then as the screen gets smaller you override what you need to. So, max-width media queries in general.”  
(Coyier Chris, 2013)

### 3.3 Mobile First Approach

Mobile first approach this is a media query control which starts from smaller screen to the bigger screen, this is more a better approach which many designers are talking about as the best way to create a responsive design and it a more easier and better steps to follow. When elements are smaller, it is easy to make them bigger, so from down to

up a more effective approach. I have been using this method for a while now and I find it better solution and it makes things easy and simple.



“Your small screen styles are in your regular screen CSS and then as the screen gets larger you override what you need to. So, min-width media queries in general.” (Coyier Chris, 2013)

### 3.4 Screen Sizes/ Resolution

Screen sizes or resolutions is the biggest and the most difficult part of web designing, sometime a device can be smaller with a high resolution like a desktop and responsive design can be difficult since designers are targeting the resolution through media queries, it is difficult to know how big is the device and some sight might not look good on small devices with higher resolutions. One of the things which I have been having problems with and I am sure most of other designers are having the problems, but most of them just create a breakpoint for mobile devices, since no one could figure out how to detect the actual screen size, there has been many code snippet out there is meant to do that, but still not working well, maybe something new will be introduced in JavaScript or maybe CSS that will solve this problem, that is something every designer have to wait for and maybe it will be included into any of those two.

“Your small screen styles are in your regular screen CSS and then as the screen gets larger you override what you need to. So, min-width media queries in general.” (CSS-Tricks)

## 4 ANIMATIONS AND TRANSITIONS

The animations and transitions can be done with CSS3 or JavaScript and both have their advantages and disadvantages, I always like to use the CSS animation and transitions, but I use JavaScript to control them. Before when you want to animate or use transitions on a website, you have to rely on flash, which is kind of old now and many designers are moving away from flash, is not good and it can change things dramatically on a fly, everything has to be done before hand, but with the new CSS transitions and animations, you can move or change HTML elements anytime you want without any problems. There is a big different between animations and transitions and I will explain more below about those differences.

Example can be viewed at <http://codepen.io/clemeleon/pen/MYRVrN>

### 4.1 Animations

Is a multiple steps of animating an HTML elements, a continuous movement or a change of height of an element and it will go back and forth without pausing or stopping, the animation works with something called @keyframes and in the keyframes, you can define some values, it can be from {values} to {values} or it can be defined with percentages 0% {values} 50% {values} 100% {values}. CSS animation properties are handy and easy to use, they give you control over the animations.

- **Animation-name:** name with the @keyframes, the name you will reference in your animation.
- **Animation-duration:** How many seconds or milliseconds an animation takes to complete

- **Animation-timing-function:** Determine the speed between the animation, ease-in, and ease-out or linear.
- **Animation-delay:** The delay before the animation starts.
- **Animation-iteration-count:** This determine the numbers of times the animation should be played, this is good if you want it to go 5 times only you just need to add 5 instead of infinite.
- **Animation-direction:** determine if the animation should play in reverse on alternate mode.
- **Animation-fill-mode:** This allow the animation to keep the applied values to replace the default values.
- **Animation-play-state:** Specifies whether the animation is running or paused.

All the animation properties have their use and I have used some of those, but it always depending on what you want to achieve with the animation.

“CSS3 animations allows animation of most HTML elements without using JavaScript or Flash!” (W3school, 2015)

## 4.2 Transitions

CSS Transitions is different from animations, transitions are a single transition of an element or multiple elements, which will once from here to there and back, for example if a have a div element on a page and I want to increase the width on a mouse over or hover, I could do this without using transition, but it will kind of snap the width to go from 50% to 100%, but with CSS transitions, I can make it looks more smooth and gentle on the eyes, the users will be able to see the effect on a more better way, it will slowly and grow from 50% to 100% in a nice smooth way. Transitions can be used to change anything, ex opacity, background, height, width, color and font-size, but it cannot got continuously like a CSS animation. This will only happen when the mouse is present on the element, so is from one value to the other. Transitions can be controlled by JavaScript if need or only by CSS, depending on the situation. The ways transitions can be triggered are: CSS Sates - :hover, :active, :focus, :checked, :disabled, orienta-

tion and media queries, JavaScript – by adding a class to the element through JavaScript, it can also be done with all the CSS codes directly into JavaScript file, but more easier to have it all in the CSS file.

“CSS3 transitions allows you to change property values smoothly (from one value to another), over a given duration.” (W3school, 2015)

## 5 WEB DEVELOPMENT

Web development is a big part of building a website or any web application, for example building a simple website or a complex one, the languages I used in building my site was PHP a back-end language and JavaScript a front end language.

### 5.1 Programing Languages

There are many other web development languages available, for example: Java, C++, Ruby on rails, Python and PHP, those are the backend web development languages, the other are the frontend languages, which is JavaScript. This languages is used by many web developer and designer and it is wildly used in all most popular websites, such as Facebook, google plus, Microsoft. I enjoy working with PHP and JavaScript, is has been what I have been familiar with when I got into web development, so will explain a bit more about both.

### 5.2 PHP: Hypertext Preprocessor

PHP is a backend language which helps in developing a web application, it is the backbone for most websites and it has always been the language which is common among developers and it is the language I used in this project. I used PHP to handle all the



work going on the server side, it serve up the page requested by the browser and it will go through all the conditions and pass the right information on the right page. \$ is a popular character in PHP and any words that starts with a \$ sign is a variable and variables can be created anytime or anywhere, sometimes is always good not to have two variables with same name, this will not give any error, but it will overwrite the old value to the new value, for example: I declare a variable called \$name = "name"; the variable \$name is not = name, anytime u use the variable \$name, I will get the result name, but if I declare it again and have a different value \$name = "noname"; next time when I check the \$name, it will now be noname, variable are unque and you annot have one variable with multiple values, that is only possible if you have an array. Array is PHP variable which can have multiple values and those values can be retived using their position on the array or by their values. Many popular website like Facebook, and Wikipedia are written in PHP and frameworks, libraries and CMS such as WordPress, Joomla, Drupal, Zend, CakePHP, Laravel, and OScommerce (E-commerce software) are also written in PHP.

“PHP (recursive acronym for PHP: Hypertext Pre-processor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.” (PHP Group, 2015)

### 5.2.1 PHP Frameworks, Libraries and CMS

Many Frameworks and libraries are available and most of them are open source, which means free for use by everyone. but I will talk more about the familiar and popular ones, WordPress is one of the popular ones around, I have developed two sites on WordPress and I have found it easy and simple to use, sometimes I do not get the freedom I wanted when create a complex design or if I wanted something to work a different way, I always leave the database structure without making any changes, I based my design on the kind of frontend only mostly and I created functions which are already available in WordPress , easy and simple to implement most of the functions and if something is needed and I want to make things easy, I use plugins that are available for free or paid, it depends on the creator. WordPress is an interesting CMS, but I do not like to use it much because of the treat it can pose to data and information, but

it is useful for people who will be creating a blog website, I would not recommend it for a shop or e-commerce even though it will be easy to implement it, I will go for other CMS like OScommerce which is a more powerful and better option for an online store.

### 5.3 JavaScript

JavaScript will be the only frontend language I could think of, most all the popular sites, ex: Facebook, Twitter, outlook, google plus and all other websites, every web developer and designer uses JavaScript on every project they make. This language makes animation or transition very nice and it help to get the content to the user without reloading the page everything single time they click on a link or change a value on a site with the help of HTML and CSS. But I use jQuery, which is a library in JavaScript.

#### 5.3.1 JavaScript Libraries and Frameworks

A more complete list of JavaScript Libraries and Frameworks are jQuery, Dojo Toolkit, Midori, MooTools, Prototype JavaScript, YUI Library, WinJS and Angular, but I will talk more about jQuery, it has been my go to JavaScript library, it works simple and it is easy to use, once the file is imported, I can do everything with this library by using the \$ symbol to declare that I am using jQuery, sometimes I use Raw JavaScript code directly, that is only when needed and there is no problems with both working together, they are both doing the same thing, jQuery just make more complex code easy to read and write. JQuery is the easy, fast, small, and feature-rich JavaScript library, which will allow you to get things done fast and smooth, without know the raw JavaScript. JavaScript is not so simple and sometimes it can be a little complicated, but jQuery makes JavaScript simple and easy to use for everyone.

## 6 CASE STUDIES

This project has been a challenging and also interesting topic, and I will further explain in details the project work process. The research part aim was to find out how useful was the site, by getting feedback and creating a site questionnaire with a group of people to test drive the site and give their honest opinion on it and those people does not have any knowledge about HTML or CSS, but just to tell their feeling after using the site.

### 6.1 Clemeleon.com

I started by identify the project, why I wanted a website and who are my audience, gathered all the relevant information and tools needed, after that I did some research by checking out different websites and taking notes of features, like how their site works in general on multiple devices, their font size, typography, the way the sites are restructured, based on the viewing. I brainstormed with everything to know where I wanted to go with my project and what I want to achieve from it, the next step was for me to get the layout structure, then I started by sketching and coming up with many different design, interactions and animations, how I want element to move on the page, the behaviour of everything depending on what the user clicked or hover on. Then I did the wire framing to see what the idea looks like, and then the mock-up followed with the idea positioning and size by calculating how much pixels is added to each elements on the page. This mock-up as supposed to be the final step, but at the end of the day, when I started coding, I ended up changing something, due to some problems or situation. There are many browsers available, but 5 of the most popular browsers are (Internet Explorer, Google Chrome, Safari, Firefox and Opera), when I started coding, I figured out that I have to support the older browsers too, but for this project, it will be additional work for later, most of the old browsers do not support SVG images, mostly old internet explorer browsers and I will create a fall-back images for those later.

There is a standard prefix which was documented on W3school, but also every web browser that does not support this global prefix will have its own workable prefix, for example, I had a `border-radius: 50%;` and if tis do not work in Internet explorer then I

will have to use the MS prefix to solve this issue, it will look like this `–ms-border-radius: 50%`; and this goes for all the other browsers too. Sometimes I have forget to write all the prefixes and I tested the site on all the 5 browsers and one seem different and weird, I had to go through my code again to find the error and fix it, everything was a little complicated and difficult until I come across this CSS Pre-processors, LESS and SASS, my first move was to choose between both and get a better feeling which one I should use and it was very simple for me to start with SASS, because it look like normal CSS and I was able to use the SASS code and normal CSS together and I was able to create multiple SASS files and compile them into one single CSS file, which I found amazing, this SASS made my code simple and east to read, I created a separate SASS file for each section on the page and error was easy to fix and code was faster to write with the ability to create **mixin** for example to write one code line for a border-radius and it will automatically generate all the rest for me without any error or problem, I just have to call the mixin first.

Development and back end of the site was based on PHP and I used it with a front-end tool Ajax to create a better and simple way to get content to the visitor of the site without reloading the page.

## 7 RESEARCH ANALYSIS

When the project was completed, I sent out a survey to get feedback which was 11 in total and I got 19 replies. Below are the result of the survey.

1. How fast was the first load?

**Table 1:** shows the reply and percentages to question 1

Answers	Number of People	Percentages
Very slow	0	0%
Slow	1	5%
Ok	2	11%
Fast	9	47%

Very fast	7	37%
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2. What do you think about the homepage?

**Table 2:** shows the reply and percentages to question 2

Answers	Number of People	Percentages
Not at all appealing	0	0%
Not so appealing	1	5%
Ok appealing	7	39%
Very appealing	7	39%
Extremely appealing	3	17%

3. Navigate to any page on this site and give a score on the page load.

**Table 3:** shows the reply and percentages to question 3

Answers	Number of People	Percentages
Very slow	0	0%
Slow	0	0%
Ok	8	42%
Fast	8	42%
Very fast	3	16%

4. Does the contact form on the contact page works and was it fast?

**Table 4:** shows the reply and percentages to question 4

Answers	Number of People	Percentages
Very slow	0	0%
Slow	0	0%
Ok	6	31%
Fast	7	37%
Very fast	6	32%

5. How easy was it to find information on this website?

**Table 5:** shows the reply and percentages to question 5

<b>Answers</b>	<b>Number of People</b>	<b>Percentages</b>
Not at all easy	0	0%
Not so easy	1	5%
Ok easy	5	28%
Very easy	9	50%
Extremely easy	3	17%

6. Was the site information easy to understand?

**Table 6:** shows the reply and percentages to question 6

<b>Answers</b>	<b>Number of People</b>	<b>Percentages</b>
Not at all easy	0	0%
Not so easy	0	5%
Ok easy	4	21%
Very easy	10	53%
Extremely easy	5	26%

7. Does this site load correctly on all your devices?

Some replies for question 7

**Answers to question 7**

- Works perfectly on all my devices.
- Yes, the page is responsive and so it sorts well, no matter what size the page is resized to.
- Yes this site loaded correctly on my devices.
- I used only laptop and it worked well.
- Yes it load correctly on my phone.

8. Does this site works on all the browsers you have?

**Table 7:** shows the reply and percentages to question 8

<b>Browsers</b>	<b>Count of Browsers</b>	<b>Percentages</b>
Google Chrome	13	45%
Internet Explorer	5	17%
Safari	3	10%
Firefox	7	24%
Opera	1	4%
Others	0	0%

9. How satisfy are you with the whole experience on this website?

**Table 8:** shows the reply and percentages to question 9

<b>Answers</b>	<b>Number of People</b>	<b>Percentages</b>
Not at all satisfied	0	0%
Not so satisfied	0	5%
Ok satisfied	4	21%
Very satisfied	10	53%
Extremely satisfied	5	26%

10. How likely is it that you would recommend this website to a friend or colleague?

**Table 9:** shows the reply and percentages to question 10

<b>Answers</b>	<b>Number of people</b>	<b>Percentages</b>
1	0	0%
2	0	0%
3	0	0%
4	1	5%
5	2	10%
6	1	5%
7	3	16%
8	6	32%
9	4	21%
10	2	10%

11. Do you have any other comments about how this website can be improved?

Some replies for question 11

#### **Answers to question 11**

- Make it more colorful.
- At first it was difficult to go forward to your projects. But this is more about learning to use new kind of form of website.
- It would be nice to add some color to this website.
- Smoother and simpler user interface and interactions.
- Fixing the thing for mobile so that front page is correct. I might move away from the boxes that slide from the sides and make them steady all visible on main page. Black and white theme is good but I would add maybe some color, or then make some changes to make it pop more. Location button don't work or then I don't know how to use it. Contact page looks little bit funny but OK.

## **8 CONCLUSION**

The purpose of my thesis work is to discover the best approach to follow when creating a successful website, all the necessary steps shows how serious most web designers and developers take their jobs. All the research and coding I have done during my thesis has been great and it gives me a better knowledge of the whole process and I have learn many new things and new ways to create a website or a plugin.

Web design or web development is not only about creating a good-looking website, is about getting the design right to make people who visit the site to stay on their first visit and also to make them come back again the next time.

Every design should have a meaning and also it should be tailored to the one who owes it and also to deliver a good experience all-round to the users or customers.



## 9 APPENDICES

### Website Feedback

Before you start this feedback, kindly visit <http://clemeleon.com>

12. How fast was the first load?

- A.** Very slow [ ] **B.** Slow [ ] **C.** Ok [ ] **D.** Fast [ ] **E.** Very fast [ ]

13. What do you think about the homepage?

- A.** Not at all appealing [ ] **B.** Not so appealing [ ] **C.** Ok appealing [ ] **D.** Very appealing [ ] **E.** Extremely appealing [ ]

14. Navigate to any page on this site and give a score on the page load.

You can visit any page, maybe the about page.

- A.** Very slow [ ] **B.** Slow [ ] **C.** Ok [ ] **D.** Fast [ ] **E.** Very fast [ ]

15. Does the contact form on the contact page works and was it fast?

You can write something and send it

- A.** Very slow [ ] **B.** Slow [ ] **C.** Ok [ ] **D.** Fast [ ] **E.** Very fast [ ]

16. How easy was it to find information on this website?

- A.** Not at all easy [ ] **B.** Not so easy [ ] **C.** Ok easy [ ] **D.** Very easy [ ] **E.** Extremely easy [ ]

17. Was the site information easy to understand?

- A.** Not at all easy [ ] **B.** Not so easy [ ] **C.** Ok easy [ ] **D.** Very easy [ ] **E.** Extremely easy [ ]

18. Does this site load correctly on all your devices?

Your phone, desktop and tablets and you can also resize the browser window.

.....

19. Does this site works on all the browsers you have?

If you have access to many browser, you can try the site to see if it works.

Firefox:  Google Chrome:  Internet Explorer:  Safari:  Other:

20. How satisfy are you with the whole experience on this website?

**A.** Not at all satisfied  **B.** Not so satisfied  **C.** Ok satisfied  **D.** Very satisfied   
 **E.** Extremely satisfied

21. How likely is it that you would recommend this website to a friend or colleague?

1 is Not at all likely and 10 is extremely likely

Not at all likely 1:  2:  3:  4:  5:  6:  7:  8:  9:  10:  extremely likely

22. Do you have any other comments about how this website can be improved?

.....

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