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Zurb Foundation Framework: A Review Paper

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Article Info

Abstract

Zurb Foundation is a modern enterprise frontend framework used to design good looking responsive websites. It is an open source, modular and a customizable tool which contains multiple HTML, CSS and JavaScript based designed templates for various interface components such as buttons, forms, navigation, typography etc. This review paper focuses on an effective analysis of this framework.

1. Introduction

The term "Web Development" refers to the process of creating applications that works using internet. It can be classified into two parts i.e.

▪ **Frontend web development**
The client side of the application is termed as frontend web development. It is the part of the application where the user interaction occurs. The technologies and frameworks used in this development are Html, CSS, JavaScript, Bootstrap, Foundation, React, Angular, Material UI, VueJS, Tailwind CSS, jQuery and many more. Front-end frameworks help developers to create their websites easily and quickly and hence reduce the development process [3] Different frameworks have different pros and cons and different areas of specialization hence developers can choose any framework as per their needs [2].

▪ **Backend web development**
The Server side of the application is termed as backend web development. This part of an application is responsible for storing, accessing, and managing data, session management etc. The technologies and frameworks used in this development are PHP, Java, Python, Node.js, Express, Django, Rails, spring etc

Hyper Text Markup Language
Html is used to define the structure of a web page [4]. Servers or local storage pass html documents to web browsers that displays them as a web page.

Cascading Style Sheet
CSS is used to style html elements to increase the readability and the user experience of a website [4]. It is also useful to provide specific styles to multiple web pages at the same time and it also increases the loading speed of pages by enabling the ".css" file to be cached. It is also useful for responsive web designs, which means that the content of a website can be fitted into various devices with different screen resolutions.

2. Foundation

Zurb Foundation is an advanced frontend CSS framework used to develop good looking responsive websites. It is an open- source framework that provides various code snippets, Html and CSS components, responsive grid system etc. It was released in October 2011. It is modular and customizable and consist of multiple SASS style sheets that is used to implements its various components. It is excessively tested on various devices and follows a mobile first approach

4. Advantages of Foundation

▪ Using this framework, we can easily customize our website, though its design already looks great and does not require customization.
▪ It has a very flexible grid system; we can easily collapse different columns and reduce channels by just adding a 'Collapse' class. We can easily create same size columns with very less HTML.
▪ This framework provides a complete library for form validations that extends HTML5 validation API. We can also easily build multilingual websites because this framework provides a wide range of languages to choose from.
▪ It also provides multiple resources and services as support.
▪ Some primary CSS styles are also added in this framework hence in case the added class names goes wrong, or if we want minimal style in our code, we will be able to see some effects without the need for coding [1].
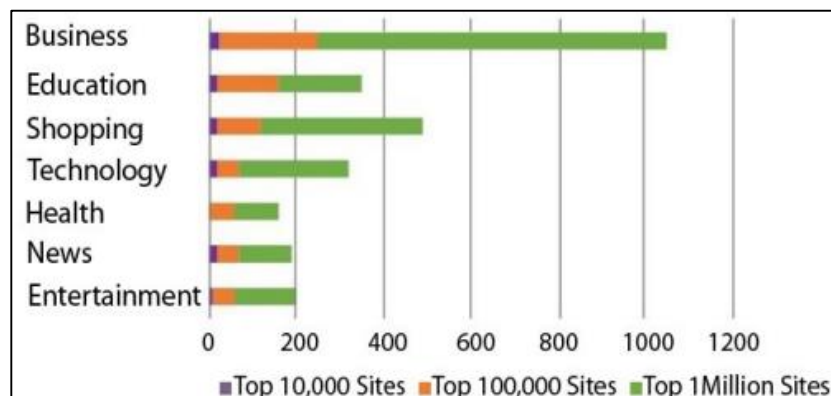▪ We can also build responsive site without adding classes using this framework [1].

Fig 1: Statistics of websites using Foundation Framework

5. Foundation Media Queries

It uses three media queries where "small" is used for any screen," medium" is used for screens with a resolution of 640 pixels and wider, and "large" is used for screen with a resolution of 1024 pixels and wider [7].
We can also change these breakpoints by using the syntax below

```
$breakpoints: (
  small: 0px,
  medium: 640px,
  large: 1024px,
  xlarge: 1200px,
  xxlarge: 1440px,
);
```

Fig 2: Syntax to change breakpoints for required screen resolutions

6. Foundation Grids

Grid system is a combination of rows and columns that defines the layout of a page. This framework has a very flexible grid system. We can easily place columns in the center. We can also create block grids to easily create columns of equal size with less html code. The "collapse" class can be used to edit columns easily [1]. Its grid system can display up-to 12 columns in a page. We can also generate our own customized grid using set of SASS mixins [7].
The basic grid structure can be made using the following syntax-

```
<div class = "row">
    <div class = "small-*"></div>
    <div class = "medium-*"></div>
    <div class = "large-*"></div>
</div>

<div class = "row">
    ...
</div>
```

Fig 3: Syntax to create grids

The class row is used to create horizontal columns, and only columns can be the immediate children of the row div. The columns are created by specifying the number (in range of 1- 12) inside the class. For eg, in case the number of columns required is 6 then we should specify the class as "medium-5" [7].

7. Foundation Typography

In this framework, different inline elements such as paragraphs, headings, keystrokes, headers etc are defined with simple and attractive styles. To add content inside a web page we use the <code> tag. Typography helper class is also defined in this framework to adjust the elements in our website as per our choice.

8. Foundation Components

This framework also contains prebuilt multiple CSS

components such as buttons, tables, progress bars, callout panels, sliders, switches, forms etc for our use.

8.1 Buttons

Using this framework we can create buttons of different styles, colors, and sizes. All we need to do is to assign "button" class to the anchor tag or in case we want to make changes on the same page then we can also use the button tag.

```
<button type="button" class="success button">Eureka</button>
<button type="button" class="alert button">Delete </button>
<button type="button" class="warning button">Be careful</button>
<button type="button" class="secondary button">Information</button>
<button type="button" class="disabled button">Trash</button>
```

Fig 4: syntax to create button of different colours

Fig 5: output of the code for figure 4

```
<div class="secondary button-group">
  <a class="button">Click For Info</a>
  <a class="dropdown button arrow-only">
    <span class="show-for-sr">Click the button to see the
    dropdown menu</span>
  </a>
</div>
<br>

<div class=" success button-group">
  <a class=" button">Eureka</a>
  <a class="dropdown button arrow-only">
    <span class="show-for-sr">Click the button to see the
    dropdown menu</span>
  </a>
</div>
<br>

<div class=" alert button-group">
  <a class=" button">Beware</a>
  <a class="dropdown button arrow-only">
    <span class="show-for-sr">Click the button to see the
    dropdown menu</span>
  </a>
</div>
```
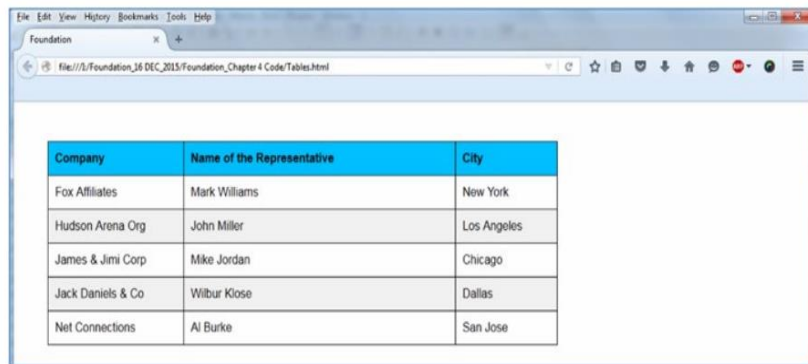
Fig 6: syntax to create split button of different colours

Fig 7: Output of the code in figure 6
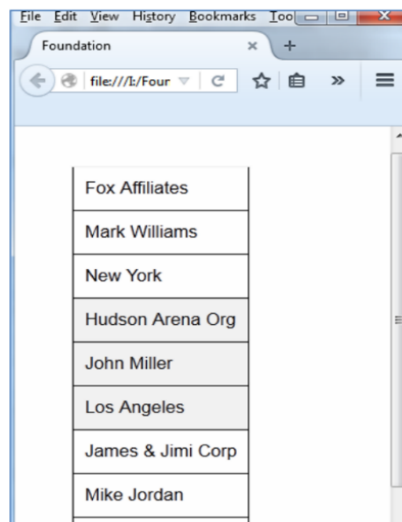
8.2 Tables
To create a table, we just have to define the widths of each columns in our Html code. We can also use the "hover stack"

class to display our table in smaller screens [6]. (Shenoy, 2016). The below Figure shows how it works-

Fig 8: design of tables

Fig 9: Table design for small screens

8.3 Progress Bars

We can create attractive progress bars using the ".progress" class and to display its width we have a progress-meter class, we can also give different colours to it using the contextual colours classes like success, warning, alert etc.

```
<div class=" success progress">
  <div class="progress-meter" style="width: 30%"></div>
</div>
<br>
<div class=" alert progress">
  <div class="progress-meter" style="width: 50%"></div>
</div>
<div class="progress">
  <span class="progress-meter" style="width: 75%">
    <p class="progress-meter-text">75%</p>
  </span>
</div>
```
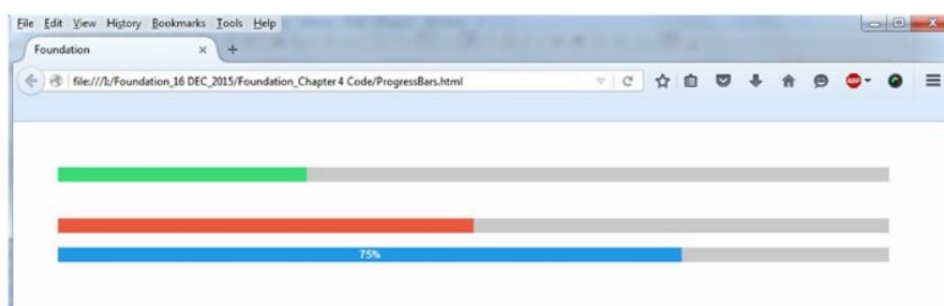
Fig 10: syntax to create progress bar

Fig 11: Output of code in figure 10

8.4 Switches
It contains two types of switches- Radio switches and Checkbox switches to display the On or Off state. We define the input type as radio or checkbox to create these kind of switches. The figure below shows its designs [6] (Shenoy, 2016)
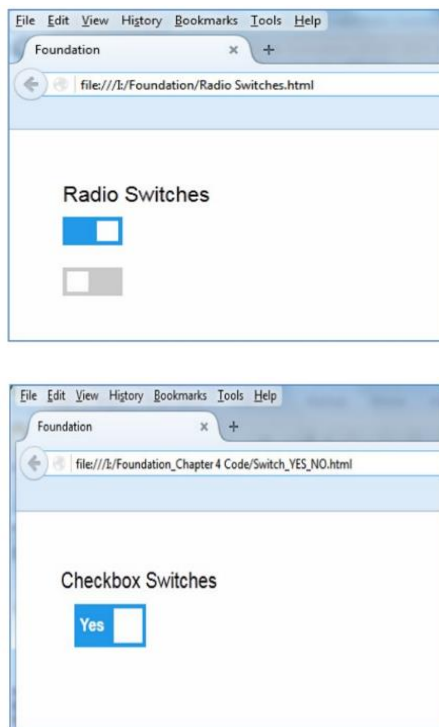

Fig 12: Designs of switches

9. Foundation Javascript Components
Foundation provides us multiple JavaScript components such as accordions, drop-downs, equalizers, modals etc, to make our work fast and easy.

9.1 Tabs
Tabs are a great way to present our content in a compact way. We can use this functionality by creating a list using <ul> and <li> tag and assigning "tabs" class to the <ul> tag followed by assigning data-tabs and an id to it. Each <li> tag should be given the class "tabs-title". The ".is-active" class can be used after tabs-title to specify an open tab. The image below shows the design of tabs element [5] ("Shenoy, 2016).

Fig 13: Design of Tabs

9.2 Accordions
Accordions helps us save space by accumulating a large amount of content in a smaller area.
It is a collection of options that can show or hide content when they are selected.
In order to create an accordion, we first have to define a <div> with "row" class followed by a div with responsive class. Then we should create a list ad assign "accordion" class to the <ul> tag followed by using data-accordion and assigning

"tablist" value to the attribute role. The "accordion-item" class should be given to the tag (we can also assign "is-active" class to the open item). Inside the <li> tag, the title is given using the anchor tag assigning the value "tab" to the role attribute and giving it a class "accordion-title". For the content we create a container and assign "accordion-content" class to it.
Below is the image of the sample code along with its output. [5] ("Shenoy, 2016).

```
<div class= "row">
<div class = "small-8 small-centered columns">
<ul class="accordion" data-accordion role="tablist">
<li class="accordion-item is-active">
<a href="#section1" role="tab" class="accordion-title">About Apress Media LLC</a>
<div id="section1" class="accordion-content"role="tabpanel"
data-tab-content>
Apress Media LLC provides high-quality content building a
pathway to career success.
</div>
</li>
<li class="accordion-item">
<a href="#section2" role="tab" class="accordion-title">Apress News</a>
<div id="section2" class="accordion-content"role="tabpanel"
data-tab-content>
Apress Media LLC is a technical publisher devoted to meeting
the needs of IT professionals.
</div>
</li>
<li class="accordion-item">
<a href="#section3" role="tab" class="accordion-title">Apress
Sales and Distribution</a>
<div id="section3" class="accordion-content"role="tabpanel"
data-tab-content>
Apress titles are available to purchase just about everywhere
in the World.
</div>
</li>
</ul>
</div>
</div>
```
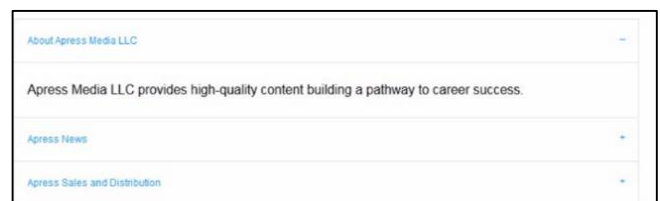
Fig 14: syntax to create accordions

Fig 15: Output of code in Figure 14

10. Conclusion
Foundation is a useful framework to develop attractive and responsive websites in less time. It has multiple pre-built components that are easily customizable and can make our work easy. With each updates it is becoming more and more developer friendly. Many websites such as dropbox.com, PBS [1], sourceforge.net, bitly.com etc are built using this framework. It also provides multiple free resources and support to the community. Evidently, there are numerous benefits of using this framework, hence it is worth a try.

11. References
1. Laaziri M, Benmoussa K, Khoulji S, Larbi KM, Yamami AE. Analyzing bootsrap and foundation font-end frameworks: a comparative study. International Journal of Electrical & Computer Engineering. 2019; (2088-8708):9(1).
2. Lakshmi DR, Mallika SS. A review on web application testing and its current research directions. International

Journal of Electrical and Computer Engineering. 2017; 7(4):2132.

3. Cletus WD, Kakandar A, Paul CN. Responsive Web Design Frameworks: A Review. Int. J Sci. Res. Comput. Sci. Eng. Inf. Technol. 2017; 4(5):132-136.

4. Jain N. Review of different responsive css front-end frameworks. Journal of Global Research in Computer Science. 2014; 5(11):5-10.

5. Shenoy A. Introducing Zurb Foundation 6". Berkeley, CA: Apress, 2016. doi:"10.1007/978-1-4842-1796-2_5"

6. Shenoy A. Introducing Zurb Foundation 6. Berkeley, CA: Apress, 2016. doi:10.1007/978-1-4842-1796-2_4

7. https://www.tutorialspoint.com/foundation/foundation_the_grid.htm