Bootstrap : Recap

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ABSTRACT

Bootstrap was the framework originally created by Twitter. It's the most popular HTML, CSS and JavaScript framework when it comes to developing a responsive friendly website. It is front-end framework that is used for easier and faster web development process. Working with Bootstrap is not difficult; it only requires basic designing skills and having some knowledge working with the layouts. Bootstrap helps in the rapid and fast pace creation of the layout as it has a prewritten code for many major designing elements on the web. Sites which we develop using bootstrap is identically displayed on different devices because it makes the content of the website responsive, that is it can adapt to any size screen.

Keywords: Bootstrap, CSS Framework, Responsive content.

I. INTRODUCTION

Bootstrap was developed by Mark Otto and Jacob Thornton at Twitter. Bootstrap is Many websites have a headerbar, footerbar, navigationbar, column grid, modals, carousels, etc. Bootstrap contain these components, so rapidly design by saving time by not having to rewrite styles you would probably need anyways. Bootstrap is sleek, intuitive, and mighty mobile first front-end framework for faster and easier web development. It uses HTML, CSS and Javascript.

In order to be using bootstrap, it must be download and installed first. At the official the free framework which is open-source collection of a HTML, CSS, and JavaScript tools.

bootstrap site, you can decide if you want to load bootstrap completely or only parts of this framework. The downloaded file contains one CSS file and one which is JavaScript file. These must be integrated into the head tab of the HTML page. You can then use the bootstrap specifications on their own site.

Bootstrap is one of a best resource for use to front-end web developers. It provide structured framework and massive library of CSS and JavaScript code that you can draw on when building your website. It also allows to

include interactive JavaScript plugins and other code from the external source - even if you have very limited JavaScript knowledge! Responsive design is a focus of bootstrap framework, and the latest update (Bootstrap 5) provides most options than previous versions. Meanwhile, it is, also used to build the backend webpages and to create web applications.

II. Bootstrap Usage Statistics

The user base of Bootstrap is really very huge, and it is the second most starred project on GitHub, with over 146K stars by December 2020. For a long time and till now, Bootstrap has been one of the most popular front-end frameworks and has been featured in the top list by many developers. There are not many frameworks like Bootstrap when it come to designing stylishly special front-end websites.

Bootstrap is used by 22.2% of all the websites, that is a JavaScript library market share of 27.2%.[5]

Used by **5,152,699** websites and **2,381,602** unique domains.[5]

Top Websites Using Bootstrap are:

Samsung.com

Cnn.com[5]

III. Bootstrap Features:

Primary purpose is to add to a web project is to apply Bootstrap's choice of colors, sizes, fonts and layout to that project. The primary thing is

Usage of bootstrap in various sectors as upto date is as follows:

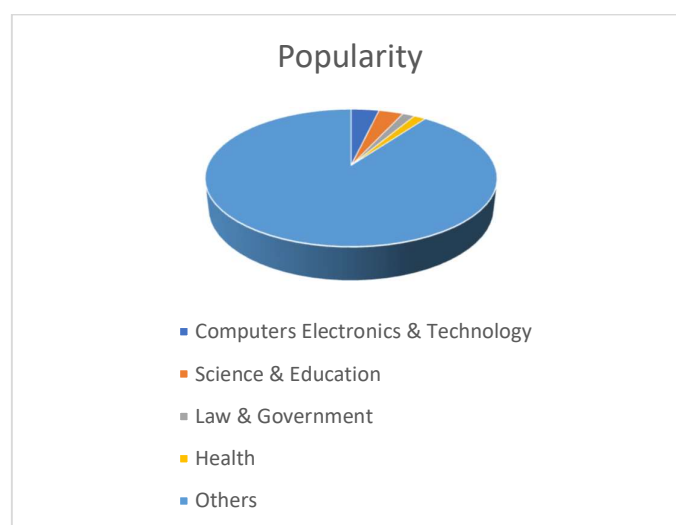| Industry Vertical	Popularity
Computers Electronics & Technology	3.69%
Science & Education	3.23%
Law & Government	1.61%
Health	1.59%
Others	89.88%

Table II.1

Chart II.1

whether the developers find those choices to their liking. Once being added, Bootstrap would provide basic style definitions for all HTML elements along with their styling. The result is that equal visuals for prose, tables and form elements across web browsers. In addition to this, developers could take advantage of CSS classes defined in Bootstrap

to customize the appearance of their contents. [2]

 Prominent components of Bootstrap are its layout components, as they affect an entire page on a web. The most basic layout component is a "Container", as every element in a page is placed in a "Container". Developers can choose in within a fixed-width container or a fluid-width container. [2] While the fluid-width container always fill the width on the web page, the former uses predefined fixed width, depending on the size of the screen showing the page:

- Smaller than 576 pixels
- 576–768 pixels
- 768–992 pixels
- 992–1200 pixels
- Larger than 1200 pixels

GRID SYSTEM

What is a Grid?

In graphic designing, a grid is a structure (normally two-dimensional) made up of a series of intersecting straight lines used to structure content. It is hugely used to design layout and content structure in a print design. In web design, it is very effective method to create a consistent layout quickly and effectively using HTML & CSS. Putting it simple words, grids in web design, organising and structure content, make websites easy to scan & reduce cognitive load on the users. [2]

What is Bootstrap Grid System?

In context of the official documentation of Bootstrap for grid system: Bootstrap include a responsive, mobile friendly grid system that appropriately scales up to 12 columns as the device or viewport size increases. It include predefined class for easy layout options, as well as mighty mix ins for generating more semantic layouts. Let we understand the above explaination. Bootstrap 4 is mobile friendly in the sense that code for Bootstrap now start by targeting small size screens like mobile devices, tablet, and then expands components and grids to fit larger screens such as laptops, desktops. [2]

Mobile First Strategy

Content: Determine what is important.

Layout : Design smaller widths first. Base the CSS address mobile device first; media queries address for a tablet, & the desktops.

Progressive Enhancement: Add element as screen size increase. [2]

Working of Bootstrap Grid System

Grid systems are used to creating page layout through a series of rows and columns that house our content. Here is how Bootstrap grid system works: [2]

Rows must have to be placed within a .container class for proper alignment and padding task. [2]

Use rows to create the horizontal groups of columns.[2]

Content should be placed within the columns, and only columns may be immediate children for rows.[2]

Predefined grid class like .row and .col-xs-4 are there for quickly making grid layouts. Columns could create gutters (gaps between column content) via padding property. That padding is offset in rows for first and the last column via negative margin on .rows. [2]

Grid columns created by specifying number of twelve columns you wish to span. For ex, three equal columns would use three .col-xs-4. [2]

Media Queries

Media query is fancy for conditional CSS rule. It applies some CSS based on certain conditions set forth. If the conditions are met, the style is applied. [2]

Media Queries in Bootstrap allow to move, show and hide content based on viewport size. Following media queries would be used in files to create the key breakpoints in the Bootstrap grid system. [2]

For all devices no matter what kind with min-width: @screen-sm-min if the width of screen gets smaller than @screen-sm-max, then do something. [2]

Grid options

The following table shall summarize aspects of how Bootstrap grid system works across multiple devices:

	Extra small devices Phones (<768px)	Small devices Tablets (≥768px)	Medium devices Desktops (≥992px)	Large devices Desktops (≥1200px)
Grid behavior	Horizontal at all times	Collapsed to start, horizontal above breakpoints	Collapsed to start, horizontal above breakpoints	Collapsed to start, horizontal above breakpoints
Max container width	None (auto)	750px	970px	1170px
Class prefix	.col-xs-	.col-sm-	.col-md-	.col-lg-
# of columns	12	12	12	12
Max column width	Auto	60px	78px	95px
Gutter width	30px (15px on each side of a column)	30px (15px on each side of a column)	30px (15px on each side of a column)	30px (15px on each side of a column)
Nestable	Yes	Yes	Yes	Yes
Offsets	Yes	Yes	Yes	Yes
Column ordering	Yes	Yes	Yes	Yes

Table III.1

IV. Bootstrap Components:

Bootstrap is composed of tens of components that can be reused to provide a good user has experience and interactions with a web page like navigation, pop-ups, dropdown, icon, button, pre-designed forms and also sizing options for different DOM elements. [7]

1) **Glyphicons** – Some of the font formatted icons available in Bootstrap. They are more than 200 in number. These glyphicons can be found at the following website https://glyphicons.com. [7]

Fig III.1

2) **Dropdowns** – These are toggle menus that has a list of links. These are done more dynamic by the JS plugin and can be found at bootstrap website. [7]

Fig III.2

3) **Button groups** – With this Bootstrap component, we can group set of buttons together in a

series adjacent to each other.

Fig III.3

4) **Button dropdowns** – This component can make a button element to trigger in a dropdown menu form. [7]

Fig III.4

5) **Input groups** – This group contains the form elements on the form field. You require use a .input-group class with a .input-group-addon class in order to use the input groups. [7]
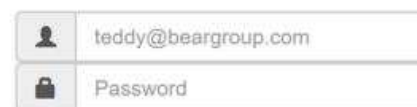

Fig III.5

6) **Navbar**-These components display as the navigation bar headers for your website. They are collapsed to be expanding vertically with a toggling menu in the devices of smaller screen sizes and become

horizontal as the screen width increase. [7]

Fig III.6

7) **Jumbotron** – A bootstrap component which can extend over the full screen (or viewport) to show some key content. [7]

Fig III.7

8) **Alerts** – A Bootstrap component with jQuery plugin that would provide contextual feedback message depending upon the user interaction. This is basically used to display alert message. [7]

Fig III.8

9) **Progress bars** – This component provide the visual on feedback on the progress of work or action finished with progress bar. [7]

Fig III.9

10) **Badges** – A component to highlight something ,example like unread messages by adding the class .badge to the DOM element.

Fig III.10

11)**Pagination** – This component gives site linking with multi-page pagination so that the content can be split into multiple pages and navigated with ease without creating complexity on a single page. Usually, the DOM element for unordered lists defined with this class pagination. [7]
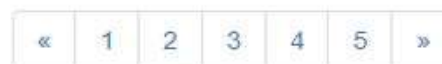

Fig III.11

V. Bootstrap-The most Popular Front End Framework and the alternatives for market.

Since long time now, Bootstrap has been one of the most popular front-end frameworks and has been in the top list for many expert developers. Choice is Bootstrap when it comes to designing splendid front-end websites. [8]

However there are alternatives to the bootstrap framework in the market. Bulma ,skeleton and Pure are competitors in the market for bootstrap: So Comparing Bulma, Skeleton and Pure to the bootstrap. [8]

Bulma: Bulma is in the market around 3 years ago and is instantly popular. It is one of the first CSS frameworks to have implemented a full-fledged flexbox grid. Bulma brings a beautiful range of colors out-of-the-box and it won't be wrong if we call it the most beautiful framework out there in the market. The downside it has compared to Bootstrap is, it is only a CSS framework, not JavaScript. So you will have to write your JavaScript or Jquery code to toggle your dropdowns or perform other basic interactions. [8]

Skeleton: Skeleton is lightweight CSS framework, popular for its 12-col fluid grid, consisting of rows and columns, similar to other CSS grids. Skeleton is the nicest alternative to Bootstrap if you want to create something small and straightforward without having to go through heaps of utilities of larger frameworks. [8]

Pure: Pure.css is CSS framework bundles of CSS modules clustered together. The crux of Pure is in its weight. It is incredibly lightweight, as it is crafted keeping mobile devices in mind, in which small file size is imperative. The framework is pure CSS in nature, justice to its name. [8]

VI. Conclusions

Depending on describing your CSS, code uniformity and consistency may become an issue; but by the use of its framework Bootstrap, it becomes possible to create website that is quick and easy to maintain also on different devices.

Bootstrap's great advantage is that it has abundance of functionalities and components that incorporate the latest trending website. It was formerly used to create only user side interface. But now it can create admin side too. The ease of handling JavaScript and jQuery, which are indispensable for creating dynamic contents, is also a major advantage.

Bootstrap is finally a trendiest front-end design frameworks. The main reason for the success is the large number of resources accessible. It is a very big online community and help is extensively easily available through the users and the community. It always is updated and is presently available in GitHub also.

If you code to the defined framework rules, you can save a lot of time and effort, which will also reduces the burden on designers and improves productivity.

This paper covers the bootstrap features of Responsive size design and usage of grid view, different components that can be used in the bootstrap. the usage statistics of the bootstrap and its position in the market place, the different alternatives for it.[8]

VII. References

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