Merits and Demerits of

Adaptive versus Responsive Web Design

Abstract

This paper attempts at understanding the basic differences between adaptive web design (AWD) and responsive web design (RWD). The articles referenced in this paper discuss about the variation in design principles, the experiences at user level and browser level and technical differences between the 2 approaches. The responsive design aims at providing the best support for viewing from browser’s point of view. It is designed to fit any screen and device size. Whereas, the adaptive design aims at providing best experience to the user. The view of the content on the website may change because of adaptation to different screen resolutions and sizes. Both web design techniques intent to respond to change in screen resolutions and device sizes but has no impact on the performance of websites as well as preferences of user.

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The terms responsive web design and adaptive web design were coined by Ethan Marcotte in 2010 and Aaron Gustafson in 2011 respectively. There are many common implementation strategies in both design techniques. In Wikipedia article, Adaptive web design (2017), it is stated that “AWD promotes the creation of multiple versions of a web page to better fit the user’s device.” It implements a detection mechanism at the server-side to choose design layout and size and displays it to the user. It uses a set of pre-defined screens to be displayed when the server detects a specific point to snap and adapt. On the other hand, [Geoff Graham](https://css-tricks.com/author/geoffgraham/) (2015) states that “Responsive websites *respond* to the size of the browser at *any* given point”. RWD adjusts the layout and functionality of the website by optimizing the layout of the screen irrespective of the browser size.

**Discussion**

**Implementation Differences:** There are a lot of difference in the ways web designs are implemented. In AWD, the device detection happens at the server-side or client-side. As soon as the request from the browser is sent, before sending the response, the website detects the resolution and type of device either at client side or server side and adjusts the response format to fit the screen adaptively. The source code to make the page adaptive is present in CSS & HTML. Separate pages are created to handle different versions of devices as well as browser widths. The repetition of code makes the code cumbersome and can result in improper display on the browser if encountered screen configuration settings are missing in CSS file. The size of images in the website are optimized for each pre-selected configuration while coding. Overall, the AWD uses a predefined set of layout sizes designed using HTML and CSS to adapt to the detected device. In RWD, the concept of CSS media queries is used to detect the device configuration. The “container” property is used to bring fluidity to the content. Additional templates for each screen are avoided and they work well with a single template to adjust to all screen sizes. Images are also resized to fit the size of the device rather than optimizing. They rely on the concept of flexibility and fluidity of the containers used in HTML code.

**Advantages:** As stated by Ivan Lamothe (2017) in his article at nilead.com, the best way to check what type of design a website in question has been implemented with is to just open the site on desktop browser and then try resizing it. A responsive design will move dynamically to arrange components on the page due to fluidity and flexibility. Whereas, the page will just optimize and shrink to smaller size when the breakpoint arrives in case of adaptive design. RWD gives the same experience to everyone viewing the website in any device. It involves less maintenance as the corresponding files are less in number. They are built to interact with the same URL for access over all kinds of devices. This helps in better social media operations and search result rankings. Whereas, the AWD design is targeted at users and is implemented individually for all possible devices user can use. The important goal of this design technique is to provide best user experience. Since user experience is the priority, there are different URLs for different devices. For example, code for mobile devices is the simplified version of the actual website and includes the most frequent and important links in the website. Due to its simplicity, the mobile sites tend to load faster and enhance the user experience.

**Disadvantages:** Along with their benefits, each of them have drawbacks too. The biggest issue with RWD is the page load time. Since the code is written in a single template, request from one kind of device doesn’t stop the code from processing it for all devices, which results in substandard performance. Additionally, since the width of desktop screen and mobile screen are varied, it is tricky to adjust the website in such a way that it appears good on both desktop and mobile devices. The major drawback of AWD is its poor search engine optimization. Due to many URLs for the same website, the overall traffic for a website might get reduced. The optimization for mobiles and tablets is put under the same bracket even though the screen resolution is different. Due to this, users might want to use the desktop version of website on tablet and not vice-versa, but they are not able to. This creates dissatisfaction among tablet users. Last but not the least, since there is enormous number of files involved, large sets of URLs need to be maintained and cross-linking of the pages must be done, the overall production cost and time is huge in this approach.

**Conclusion**

Neither of the approach used is perfect in its own way, but they both do address the user experience component of website design by adjusting the web page according to the device they are viewed in. Responsive design is a straightforward concept provided the user’s needs are clear and the way of implementation is clear. Adaptive design is cumbersome, yet it provides efficient user experience due to its pre-determined implementation and compatibility of the browser. The decision solely depends on the user’s needs and the website’s applicability on desktop and mobile devices. If the mobile users of the website use a wide variety of devices, responsive design will be the better option. If they visit desktops less frequently then adaptive design will suit better.

References

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