

RESPONSIVE WEB DESIGN ACCORDING TO RESOLUTIONS

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ABSTRACT

In this era, technology has advanced small devices such as laptop, tablet and mobiles. Their productivity has also been increased. We know that each device has different screen sizes. Now it has become a challenge for a developer that how to organize a web content and display on screen. In this paper, a comparison of different types of responsive approaches has been presented. These approaches work for various devices of screens. Our main discussion, in paper on Responsive Web Design (RWD), is highly recommended. A discussion has been made in this paper on RWD technologies and tools, issue and review of RWD. The objective of this paper is to find the best approach and suggestion for future work. This paper is guidance for the designers and the developer who will gain a better experience and improve their productivity in this field.

Keywords : Responsive, Responsive Web Design, Resolutions

1 INTRODUCTION

Today internet usability is increasing day by day. According to a static suggestion there are over 3.5 million devices which are activated [2]. When we connect to internet, we make our interaction to web services. These services have different types like (social media, online games, medical services, E-commerce and many more). These services are being used now a day. On the other hand, many devices are connected to the services such as tablet, television, laptop, desktop, smart phones, and wearable computers [3]. Devices with different view port, height and width make it harder to represent website in a responsive manner.

However, solution of the problem has been designed and different version of website for different devices has also been introduced to handle the request based on viewers viewing a platform. 67% Google survey of respondents prefers purchase from a mobile friendly website [2]. Now it has become a huge challenge to design a website for all browsers, operating systems and all devices [1]. Design and development of a web should design a properly response and settlement according to a user's platform, screen orientation, screen size and so on [4].

Responsive Web Design (RWD, is a recent approach to allow the single website, control the different view port width and height of devices. RWD handles this problem which makes web contents responsive. This paper consists of an important literature of RWD that will provide guide for web de-

velopers and designers. It helps also in designing RWD without going through trial and error learning.

2 RELATED REVIEW LITERATURES

Fixed width web design is going to an end since now responsive design has become exigency of market. Thus, mobile unfriendly and fixed width web design needs to waive. In recent development, Ethan Marchotte coined the term "Responsive Web Design (RWD)" [3] and defined some other terms, flexible images/ media queries/ and fluid grid. He explains the theory and practices of RWD in book titled, "Responsive Web Design" [5]. Websites are not optimized on small devices except shrink fit website to viewable area. Users require zoom technique constantly via touch to view it well. However, according to Marchotte, the layout of a website is altered based view port of devices, fluid and adjustable layout [3].

A combination of techniques used to create RWD, there are integral ingratiate, a flexible grid-based layout, flexible images and media, and media queries [1] [5] [6]. We need flexible content for RWD. Image must be fluid image in this context. Marcotte, has done an experiment that he inserts image to fluid container smaller. Over sized image over flows the container. They don't work in responsive environment. Marcotte, provide solution by giving maximum width constraint rule of CSS for every image to avoid the exceeded

width of containers [1] [3]. By applying maximum width of image 100% and for flexible embed videos, the same technology may be used to find the solution of such problem [8].

Besides this, Web Page Layout is important and planned aspect of Responsive Web Design. RWD works on multiple devices by using fluid proportion-based grids. It is allowed to resize the content and re-arrange as the percentage-based width of website grid contracts [7]. Pettit has recommended fluid layout that is designed exactly according to the proportion of echo page element in percentage [1].

Traditionally, a website is designed by using pixels. There was going to be same and fixed size. The website view by all devices with same larger sized for relative units like percentages, rather than pixels. If you use pixels to design a website, there's a simple mathematical formula that can help you in transition to use percentages.

Target/Context=Result

Example: Suppose you have a website that has a wrapper containing 980 PX width and you are looking at this site in a maximized browser size which is 1920 pixels. In this case, windows screen is context and wrapper is target. You can divide the target by context to get percentage value [9].

$$980px/1920=50\%$$

It is a difficult work, but developer's life has become less miserable since many frameworks available in the market such as Bootstrap, Foundation, Gumby, Semantic UI and many other similar products [1].

According to Ethan Marchotte, another most important technique which is used in RWD is media queries [1] [5]. It will automatically be adjusted to different styles according to the different screen resolutions. Media queries confirm that we can test not only some certain types of equipment but also the present physical properties for displaying our design [10]. Media queries function like a device detector which inspects device types used. It is also used to tailor a website up to a specific range of output devices without changing the content itself. CSS code written for media queries is very handy; syntax is very simple and easy to use.

If a terminal's resolution is less than 980PX, the code is [4] [5]: @media screen and (Max-Width : 980PX. If set {} a view which are compatible with iPad and iPhone, the code is: /***** iPad Screen*****/ @media only screen and (min-width:768 PX) and (Max-Width:1024 PX) {} /***** iPhone Screen*****/ @media only screen and (min-width:320PX) and (maxwidth:767PX) {}.

In RWD another compulsory design consideration that cannot be ignored is called Web Typography. Previously font common unit has been used that is PX which is not resizable unit. In PX Unit, there is a problem that it is fixed on all devices of screen. Font needs to be responsive and font has been measured in Rem (em). There are many developed types of tools in Java script which are FlowType.js, FitText.js, Big Text [1]. These tools not only of responsive size but its head-Copyright © 2018 SciResPub.

lines are also made scalable.

Fluid Image is important principal in RWD. Designed website always displays image in right resolution for targeted device. Fluid image makes picture sale and provide friendly display according to device screen. There are a lot of simple zoom techniques used such as Max-Width attribute in CSS: Image{Max-Width:100%;} [9]. If Max-Width is 60% then it will be adjusting 60 percent of image according to device [10].

3 OTHER RESPONSIVE APPROACHES

Responsive Design + Server-Side Components (RDSSC) are another approach to achieve responsive web design. This concept is developed by Luke Wroblewski [11], its functions is detected that what type of device has been used by selecting proper media, content and style content in such a way which makes it responsive on detected device at server side [1]. Nielsen, suggestions another approach based on a separate design for desktop and for mobile device [11].

Similar approach RWD is coined by Gustafson which is called Adaptive Web Design (AWD) [12]. AWD is different from RWD that is not a single layout that always changes. Instead, there are a few distinct layouts for different sizes of different devices. And the layouts depend on screen size which is being used. For example, there could be specific layout for Tab, Mobile and Desktop each which are designed in advance.

4 A COMARISON OF RESPONSIVE APPROACHES

As we know that whenever we develop application or software, we focus on few factors. The factors may be cost, quality, performance and optimization. The satisfaction of any application depends on the above said factors. But web application also depends on search engine optimization for generating a good traffic on website. In the case of Nielsen Suggestion Separate Design, we have to host two URLs, such as sub-domain (m.example.com) or an exclusively separate mobile domain (example.mobi). Its maintenance cost is very higher. More complicated SEO, requirements due to bi-direction annotation as can be more prone to error [13].

In Nielsen's ideas, huge problem is URL redirection. It breaks search from search engine and creates horrible experience for user. Besides, RWD design is Google's recommended design pattern which is enhances user experiences and avoids SEO pitfalls like bad redirects and fragmented link presence. RWD saves the sources of Google crawlers and website. Another point is that RWD prevents from duplications of content than separate design [14].

Another factor is the reduction of your page ranking. Having multiple version of site, search engine requires spending more time to crawlers. Google reduces your website rankings. On the other hand, RWD relies on a single URL and code base for laptop, mobile, tablets and desktops. It means faster crawling of bots makes better chances of page rankings [15].

Adaptive Web Design is similar to RWD approach. But one drawback of AWD is that final results don't always display the perfect for a wide variety of screen sizes. While in case of RWD, it guarantees to work well on any screen size. AWD works on as many screens as its layouts are able to do. So, if new device with a new screen released, you may find out that none of your adaptive layouts fit with it well. And it means that you have to change or add new one in it. RWD approach is flexible enough to keep working on.

RESS faster loading and less bandwidth used if compared to RWD because memory and cache on mobile feet up as it removes the unnecessary materials like as Java Script CSS or multimedia from website. For example, a website designed using RESS; it can use different image sizes for different devices [1].

However, to decrease the disadvantages of RESS more resources are required to bind with HTML. The device detection will probably not be accurate [1]. Another problem is that you need to update and maintain detection code. Every time, a new feature or new browser is released. RWD is cost effective than RESS. Google also favors RWD and improving ranking of website [16].

5 ISSUES AND LIMITATIONS OF RWD

RWD approach survives some limitations which are influenced by the user's experience of a website. A major problem is compatibility with browser because media queries are not supported by the old version of browser [1][7]. There are other concerned issues like speed and page loading time. When a user visits a friendly website and all media download on user device then resize it to fit the screen; sometimes it takes time and reduces website performance [7].

Network charges and unavailability of Wi-Fi/ mobile network can also become a problem, as well as slows down the connection speed. In addition, there are responsive websites which are unable to take an advantage of some device-specific capabilities like push-notification, offline-accessibility and local-storage that can be useful for the digital library user. Banner advertisements also a problem. It is an additional work to make responsive. This problem is solved by Google launching and Ad Sense Unit which controls to ads on different screens [1].

6 CONCLUSIONS

In this paper, researcher has discussed different types of Website Development Approaches. Such approach which produces a good result is RWD. It cannot be conclude that RWD is the best approach which solves all the relevant and related problems. Most of problems remain unsolved. Comparatively, RESS is faster than RWD but if some problems are solved in future then PRESS Approach will be the best approach in the future. As we load only such type of content that needs

to user on mobile except of that it is loaded all content like image. After that it is resized to fit screen. Page loading time will be reduced. Similarly, media queries are not supported to old browser. In future, the latest version of browser will become older then this problem will be automatically solved in future.

6 RECOMMENDATIONS

This paper is highly recommended to design a website using RWD Approach that is targeting to mobile users like as social media, news updates, blogs and many more.

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