Responsive Web Design and Development Using Html5 and Css3: A New Futurely Concept

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Abstract: **Past four decades proved a revolution for PCs and mobile phones. Drastic changes can be seen in screen resolution. It's becoming more and more difficult for web designers to fit their designs into wide variety of devices and screen resolution ranging from 320px (iPhone) to 2560px (large monitor) or even higher sometimes. A solution to cater the diversified need of user in web world is Responsive Web Designing (RWD). With the help of RWD user can get best user experience for present and future devices as well. This paper concentrates on how RWD could be an answer to formulate single design for miscellaneous delivery channel with the help of HTML5 and CSS3**

Keywords: **Adaptive Web Design (AWD), CSS3, HTML5, Responsive web designing (RWD)**

I. INTRODUCTION

Before going towards the use and importance of RWD, let us first take look on the statistics *(as shown in fig 1)*, which shows how browsing through traditional devices decreased due to use of smartphones and tablets. Any company would not want to miss out this big section of business which would result from the use of website from these slim and handy devices. Study says that, more than 50% of smartphone users use the internet through their mobile devices throughout the world to get significant information.

Website Visits by Device	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013
Traditional	81.62%	79.82%	78.79%	76.13%	73.21%
Tablet	9.55%	11.20%	11.96%	13.21%	14.58%
Smartphone	8.83%	8.98%	9.25%	10.67%	12.21%
iPad	91.11%	90.55%	90.50%	88.93%	87.52%
Kindle Fire	2.70%	1.93%	1.54%	1.43%	1.96%
Android	6.19%	7.52%	7.96%	9.65%	10.53%
iPhone	60.75%	62.65%	62.26%	60.75%	59.59%
Android	38.33%	36.28%	36.51%	37.92%	39.05%
Windows	0.92%	1.07%	1.24%	1.33%	1.36%

fig 1: Site visit percent by mobile and destop-2014

1.1 Current scenario and problems:

Dozens of different devices, operating systems and browser are used by folks nowadays to get online. But screen size is common string between a countless of Devices [2]. Due to the number of varying factors in the devices where users browse the websites, User Experience (UX) designers have

to face the tough task of figuring out how to deliver the perfect website across all of these present age devices [1].

1.2 The two types of web design approaches:

There are two most popularly used web design approaches, Adaptive web designing (AWD) and responsive web designing (RWD). RWD is an approach for designing sites to provide an optimal viewing experience i.e. easy navigation as well as reading with a minimum of scrolling, resizing and panning, across all devices [3]. AWD on the contrary can be thought of as an approach for device-specific design i.e. it comprises specific designs suited for specific media devices of diverse sizes and shapes [1].

1.2.1 Major differences between RWD and AWD:

Properties	RWD	AWD
Content	Same for all devices	Different for different devices
Cost and time	Time and cost are less as the solution is generic	More time and cost involved as its development device specific
Relies on	Mainly relies on flexible and fluid grids	Relies on predefined screen sizes
Structure	Takes more code and implementation strategies with fluid grid, CSS and flexible foundations	It has streamlined layered approach which utilizes scripting to assist with adapting to various devices and screens

II.   HTML5 and CSS3 in brief:

Before going towards the use of HTML5 and CSS3 in building of RWD, firstly let us know about HTML5 and CSS3 in brief.

2.1 HTML5:

HTML language has primary use for constructing and presenting content on the web [4]. It is the fifth version of the HyperText Markup Language. It differs from other versions of HTML because it provides additional support through graphics, multimedia, offline storage, error handling, real-time and communication etc [5]. It is an outcome of the cooperation between the World Wide Web Consortium (W3C) focusing on XHTML 2.0, and the Web Hypertext Application Technology Working Group (WHATWG).

2.2 CSS3:

The most recent implementation of HTML5 came in the form of CSS3. With the help of special stylesheets, it supports a responsive layout. the advantage of CSS3 is that you can do all that can be done using CSS in addition with the features such as text shadow, rotations, round corners, transitions, animations and of course device detection, which brings us to media queries[5]. CSS3 also includes properties such as device-width, orientation (portrait or landscape), max-width, and color features. CSS3 media queries and sensor technologies are used to control display attributes in smart devices [1].

III.   RESPONSIVE MEDIA CREATION WITH HTML5 AND CSS3:

To get started, open image in image editing software, assign your desired size say 400px. Make sure your HTML should contain your image and some text to demonstrate the responsive effect [6]. The CSS should include a class for your paragraph and one for your image and an image wrapper. Float the paragraph to the left and give it a width of 65%, and the image wrapper with a width of 35%.

Corresponding HTML code	Corresponding CSS code
<p class="text">it is the great	p.text {
image</p>	float:left;
<div class="img-wrap" >	width:65%; }
<img alt="nature image"	div.img-wrap {
class="responsive"	float:right;
src="nature.jpg" >	width:35%; }
it is the great image	
</div>	

With the help of this coding fluid layout gets generated, but does not yet do anything to create a responsive image. But the image will stay at a static at width of 400px. Now, add a new class to the CSS for the image. Assign it a max-width value of 100%. This allows the width to adjust to the browser width changes. Next, add a dynamic height property to the class.

```
img.responsive {
max-width: 100%;
height: auto;
}
```

Here when the parent element's width changes, the image changes to fill in that width. The *height: auto property* acts to preserve the aspect ratio of the image [6]. If you have to use size in percentage, then use the following formula for getting proportional percentages from fixed width pixels

target ÷ context = result [7]

IV.   MAKING RESPONSIVE TYPOGRAPHY WITH HTML5 AND CSS3:

This section divulges the code for making responsive typography. We simply have to use here CSS3 and HTML5's canvas element with JavaScript. Responsive typography helps you to apply various numbers of beautiful effects to your text. To do these, follow these steps.

Step 1: Wrap the pasted filler text of HTML document into a paragraph tag.

Step 2: Name paragraph elements as class= "a" and class="b", as shown in the following code snippet:

```
<p class="a"> It is a great image <p>
<p class="b"> the image is created by me, an I.T engineer <p>
```

Step 3: Apply style to base HTML font-size property, and then to one for the static sized paragraph to compare the font size changes

```
html{font-size:12px;}
p.b{font-size:1rem;}
```

Step 4: Two @media queries are created for orientation:landscape, and orientation:portrait. In both, the "a" class element is applied different font size

```
@media screen and (orientation:portrait){
p.a{font-size:3rem;}}
@media screen and (orientation:landscape){
p.a{font-size:1rem;}}
```

Here when you will change your browser window from one mode to another, font size changes from a ratio of 1:1 to the base size, to 3:1 of the base size. The principle behind its working is that, when browser makes a request, some conditional styles based on viewport's width are returned by the CSS3 @media query. It then loads or builds (rebuilds) on the fly for changes to the viewport's size [6].

V. THE INCREDIBLE MAX-WIDTH AND MIN-WIDTH PROPERTY:

Take the following codes into consideration;

@media screen and (min-width: 750px) { .sevenfiftyminwidth { width: 30%;float: right; }} and @media screen and (max-width: 750px) {.sevenfiftymaxwidth { clear: both;font-size: 1.3em;}}	/* iPhone ----------- */ @media screen and (max-device-width: 480px) { .iPhoneClass { font-size: 1.2em; }} /* iPad ----------- */ @media screen and (min-device-width: 768px) { .miniPadWidth { clear: both;margin-bottom: 2px solid #ccc; }}

The max-width property allows columns to have a fluid but a certain maximum width. It makes layout of the columns more flexible than static width. If the image is used here, then it utilizes this property by responding to parent element width's changes by expanding or dwindling [1][6][7].

VI. CSS GRID SYSTEM: A TOOL FOR SIMPLIFYING THE DESIGN OF RESPONSIVE WEBSITE:

CSS grid is an all-embracing tool, which helps you in the designing, modeling and production phases and also brings in coherency and alignment in the layout that can be a best fit to your customer's mobile screen. CSS grid saves up time for web designers and gives a great user experience to users [6][8]

Some of the popular grid systems are as follows,

6.1. Skeleton: Skeleton's base grid is originally an improved version of the 960 grid system. It consists of the collection of CSS files which allows web designers to rapidly construct responsive grid layouts.

6.2. Blueprint: It is a popular static CSS grid system. It provides useful plugins and a stylesheet for printing. It provides an easy-to-use framework that reduces time of designers by giving support to the most complex of layouts.

6.3. Fluid 960 grid system: It is the best option for rapid interactive prototyping. It is the content-out approach to rapid interactive prototyping. The only obstacle it faces is that it is not responsive. It behaves much like a table using column, spanned over fixed-width table headers. But people liked it so much that they are working towards fixing this problem.

6.4. Griddle: Griddle focuses towards modern browsers Sass functions and mixins were used for its generation. It gives your layouts new with the help of its CSS inline-block and box-sizing properties.

CONCLUSION:

Because of immense increment in the mobile and tablet users, RWD will prove a backbone for all business houses and will soon became a new market strategy. With the help of HTML5, CSS3 and CSS grid systems, better responsive websites can be designed in near future.

REFERENCES:

[1]. Muktikanta Sendha, IT-Services-Whitepaper-Responsive-Web-Design

[2]. Kelly Wilson (2013), "Are we over relying on screen size for responsive design?"

[3]. Ethan Marcotte (May 25, 2010), "Responsive Web design", A List Apart.

[4]. Eugen (October 13, 2011), "CSS3.HTML5, Do I really need it?"

[5]. Kelly Wilson (Sep 12, 2013), "Responsive web design with HTML5 and CSS3"

[6]. Benjamin LaGrone, HTML5 and CSS3 Responsive Web Design Cookbook.

[7]. Frain Ben (2012), Responsive Web Design with HTML5 and CSS3

[8]. Kelly Wilson (October 9, 2013), "you ought to use CSS grid system for designing"

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