RESPONSIVE WEBSITE" A TRANSFORMATION IN WEB DESIGNING

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ABSTRACT

Innovation in devices is moving at a very rapid pace resulting in day-to-day usage of Mobiles & Tablets over PC. Due to increase in number of Mobile and Tablet users, developers need to align their websites to be Compatible with Mobile and Tablets. The two most popular approaches for developing mobile based apps are (1) Responsive Web Designing (RWD) (2) Mobile Web App. The two technologies are different in nature and provide web developers a choice to choose between two technologies depending upon their application area. In this paper we have discussed various aspects of the two technologies & their difference. Paper also discuss the advantages and challenges of RWD.

Keywords
Responsive Wed Design (RWD), Mobile, Tablets, Mobile Web App, HTML, CSS.

1. INTRODUCTION

Gartner newsroom announces that the "Traditional PC Market Predicted to Decline 7.6 Percent as Change in Consumers' Behaviour Drives Transition to Tablets and Mobiles[1]. The acceleration to this is coming from the lower prices of tablets and growth in their capability. "Lower prices, form factor variety, cloud update and consumers' addiction to apps will be the key drivers in the tablet market," said Ranjit Atwal, research director at Gartner. The researchers also say that some users will have both PC, Tablet & Mobile phone but they will use Tablet & Mobiles as their first device. The table below (Table 1) shows the shipment of devices over the period.

Table 1. Shipment of devices over the period.(Thousands of units)[8]

Device type	2012	2013	2014	2017
PC & Notebooks	341,263	315,229	302,315	271,612
Tablets	116,113	197,202	265,731	467,951
Mobile phones	1,746,176	1,875,774	1,949,722	2,128,871

Below is the pie-chart (see figure 1) showing what percentage of devices is owned by the customer. This statistics was given by Ofcom Internet usage report.
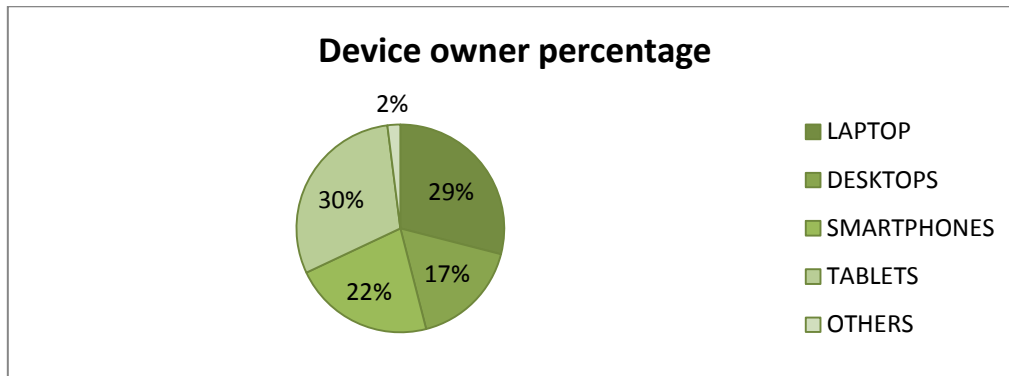

Fig 1: Device owner percentage.

These trends will definitely going to affect the software and hardware chipset modification as the consumer will expecting embrace their own app and clouds.

2. SOME GROUND BREAKING FACTS ABOUT MOBILE & TABLETS

1) Engaging mobile users with fast, quality web experiences has become a business requirement. For the 2012 holiday shopping season US Retailers saw as much as 24 percent of all internet shopping traffic from mobile devices - versus just 6 percent two years ago[3]

2)A poster child of mobile success, eBay, expects to exceed $20 billion in volume from mobile alone. [4]

3) StarCounter Global status on mobile vs. Desktop in India from December 2008 to Mar 2013(see figure 2).[5]

Fig 2: Mobile vs. Desktop in India (2008)[5]

4)In survey on internet-enabled Smart Phones in India Mid 2012 probable that the number of internet-enabled Smart Phones in India would reach 2.5 Crores in 2012, which is more than double of 2011 and five time more 5.8 Crores in 2013 growth is continues through 2016you can see from below given chart. According to Cyber Media research India's tablet PC market is expected double to around six million units in 2013, firm Cyber Media From Microsoft Tag mobile internet usage is projected to overtake desktop internet usage by 2014 [1]

5)According to mobile industry reports, 7.12% of all website traffic worldwide came from handheld devices in 2011. In 2012, that figure rose to 11.78%.1

6)According to eMarketer (a leading digital media market research firm), more than 58% of American adults will be regular mobile web users by the end of 2016. Tablets and smartphones are becoming the default choice for connecting to the internet.

7) Future forecast of Internet Enables Mobiles in India according to Indian Media and Entertainment Industry Report(see figure 3).
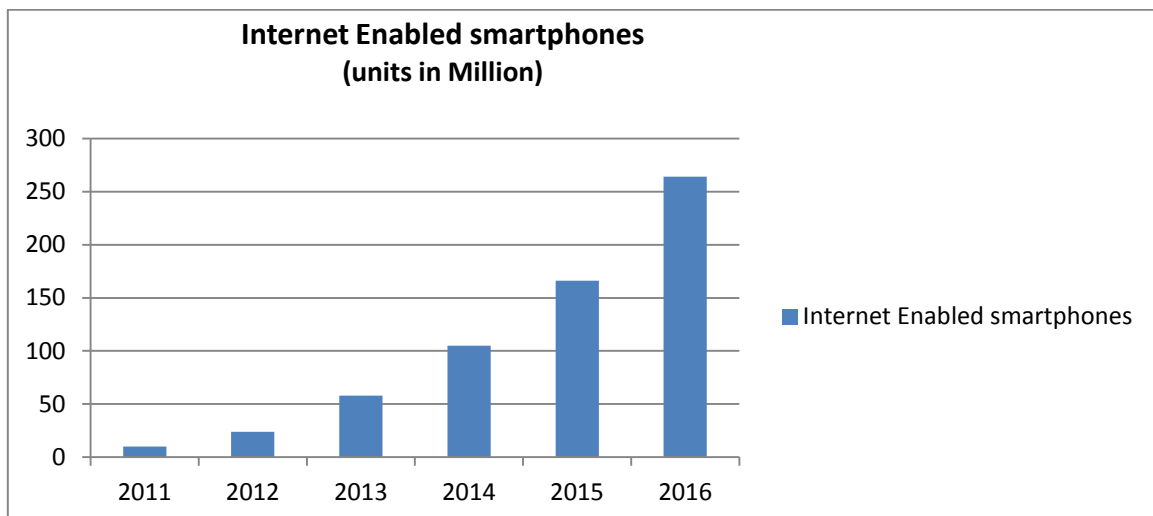

Fig 3: Internet Enables Smart Phones's Forecast [1]

The consequences of all the above mentioned facts indicates that web developers and companies should realign their web designing approach to target increasing number of Mobiles and Tablets users. Today's web development era required more inclination towards mobile & Tablets than the desktop. The solution to this trend of device change has given birth to Mobile Web App and Responsive Web Design. These two technologies are different and have their own advantages and disadvantages. So, before choosing the web design technology developer needs to consider the facts about the technology.

Another factor which is leading towards mobile based web development is that when we browse through our mobiles and tablets we need to zoom and resize the screen so as to read or click the button. This is because during web development the developers don't give importance to the fact that the same site can be browsed through Tablets and Mobiles.

RESPONSIVE WEB DESIGN: THE MODERN APPROACH

"Responsive Web Design" is a name given to the set of techniques applied at the level of the layout, so that it allows a website to adapt itself to any device or width of screen. The name "Responsive Web Design" has been found by Ethan Marcotte who is a developer and a web designer as well [6].

There are many options available in the market for designing mobile compatible apps and Responsive Web Designing is one of them. Responsive web Design means that your website will adapt according to the environment provided like Screen size, Orientation of screen and Operating system. The methodology includes dynamic adaptability according to the device.

 Moreover, if Apple develops another innovative device everyone wants, or if something like Google Glass becomes used by mainstream society, your website will be fully prepared to accommodate right away.

Google also gives better search rankings to websites that use responsive web design than websites that don't.

Fig 4: Same website on different Devices, an example of RWD.

The question which comes into mind before going for RWD is "why we should go for RWD?" and answer to this question depends on various factors like

(1)If you are starting your web site from scratch then RWD is the suitable option.

(2) If you want to keep the cost of web development low. As RWD gives you the option to maintain only one site for multiple devices.

(3) It is compatible with all new released devices after small modification. So, it is scalable.

3. COMPARISON BETWEEN RESPONSIVE WEB DESIGN & MOBILE WEB APP

Table 2. Difference between Responsive Web Design and Mobile Web App.[3]

criteria	Responsive Web Design	Mobile Web App
Technology	Single web application needs to be developed which will be compatible with all the devices.	Two web application needs to be developed separately one for desktop & one for Mobiles.
Cost	The cost is higher as the cost will increase as the no. of elements increases	The cost is low as compared to RWD.
Development cycle	The time of development cycle is higher if the elements of the sites increases.	The time to develop the site is usually less if the roadmap is defined.
Design approach	Requires knowledge of new approach	Simple to design the features and functionality required for mobile.
User Experience	The user experience is not good as Mobile Web App as the default navigation is from top to bottom, for left to right it requires some customization.	The Mobile Web Apps have good user experience as it is specially designed for the Mobile. Left to right navigation is also available.
Performance issues	Bandwidth requirement is high when websites send any heavy element.	Streamlined performance.
Maintenance cost	The maintenance cost is low as single version needs to be maintained.	The maintenance cost is Medium as two version needs to be maintained. Changes needs to be done separately.
Targeted Device	All the action happen on the server.	All the action happen on the device.
Suitable Application Area	Corporate sites, Blog sites and News sites	Sports, Entertainment and Retail.
Technology used	HTML/ CSS3 media queries.	HTML 5/JS technology.
Examples	www.progressive.com, www.starbucks.com www.microsoft.com www.sony.com www.Disney.com etc.	Google mobile app, Flipkart mobile app, Snapdeal mobile app.etc

4. KEY STEPS WHILE DESIGNING RWD

While designing RWD a developer should need to take care of various factors.

➢ The developer should clearly understand the reasons behind designing the Responsive Web Design.
➢ The developer should clear & completely understand the requirement of the user.
➢ Developer should smartly design the Grid structure, components and layouts.
➢ The website should be tested throughout its development life cycle.

 The process for development of RWD includes

(1)Research/Scoping.   (2)Wireframing.   (3)Look & Feel.   (4) Building the site.
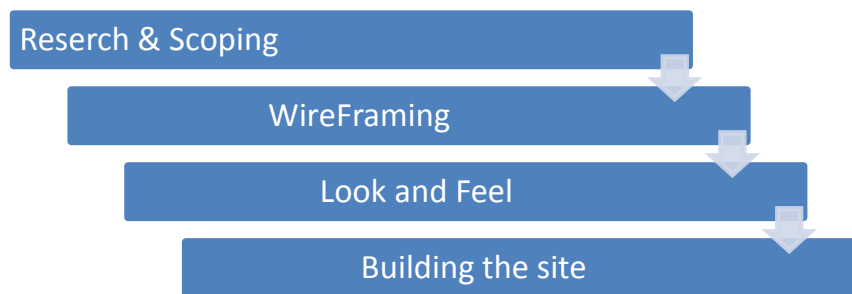

Fig 5: Various stages in development of RWD.[2]

Research/Scoping: This is the first and most important step as the developer should know the key requirements, as the end-user will going to use website on different devices but the key requirement will remain same. For example: In any hotel booking website the key requirement is to book the room whether the using Desktop, Mobile or Tablet.

Putting effort on this phase will clear the picture of functionality of RWD.

Wireframing: In this stage the developer should focus on the layout of the web i.e how the frames should change as the screen size changes. This quite tuff to design but if effectively design can give magical results. So, a developer should know how the CSS of page should change as screen size changes (see figure 6). The developer should think when the frames size decreases which functions need to be highlighted.

Look and Feel: This stage deals with visual of wireframe. How the page should be designed, how image should be placed , what font size should be used so that it should be readable on all the devices.CSS3 gives great styled effects without the use of no of images. So developer should smartly use HTML, CSS to design the pages.

Building the site: This stage includes the core designing of web site using HTML, CSS. Using the image size as small as possible so that it won't create problem in loading , using smart CSS coding so that it should keep website loading time according to device
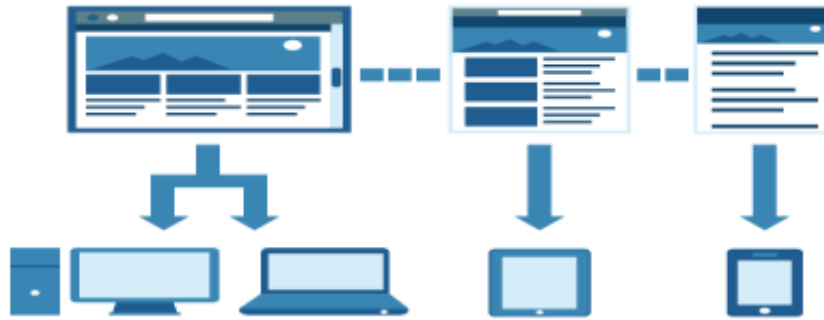

Fig 6: Designing of Templates in RWD

5. **ADVANTAGES OF USING RESPONSIVE WEB DESIGNING**
1. **Improved SEO**- A single copy of website will lead to higher impact factor and it will also give benefit to business as a single sleek web design show the key features on the page that will attract your buyers.
2. **Easy Maintenance**: A single base code will in turn give less maintenance cost as only single copy needs to updated.
3. **Increase in visitors**: The websites which are only designed for desktop will miss the mobile user which will again whereas the websites which support responsive web design are more visited.
4. **Satisfied user Experience**: The user are satisfied with the browsing experience as the screen will adjust according to device and they will get shorter pages, big buttons and big text to read.
5. **Less Investment**: This is one of the key elements as only one version needs to be developed as compared to two or three.
6. **Analysis:** By maintaining it is easy to analyze customer behaviour as compared to analyzing from three different versions.
7. **Future Proof & Scalable:** The Responsive Web Designing is compatible even for the new released devices as only small updation i.e the width of the browser needs to be updated is required**.** Thus the Responsive web designing are future proof and scalable.

6. **CHALLENGES FOR RESPONSIVE WEB DESIGNING**

One of the biggest challenges for RWD is that they are not matching with the end-user expectations in term of time taken by the page to download on small screens. RWD are complex and slow, resulting in dissatisfaction in users.Responsive web design projects are more time consuming to

create and will cost about 10-20% more upfront than regular websites [20]. However, there is no need for a separate mobile site.

According to *Guy Podjarny, Akamai Technologies' Web Experience CTO "*To deliver engaging, rich Responsive Web Design sites fast is difficult". He tested 347 RWD14 sites across different screen resolutions and compared the number of bytes required to download each page across each resolution.

Podjarny found that 72 percent of RWD sites tested were roughly the same size across different screen resolutions, and 22 percent were only slightly smaller(see figure 7).
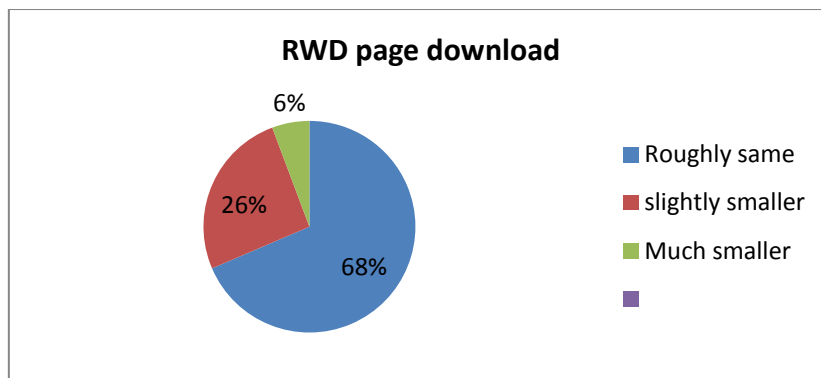

Fig 7: RWD page download time on various devices.[19]

It is observed from the survey that nearly 70% of the user expect the page to be loaded in 2 sec. So the challenge to optimize the load time should be taken care.

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Beautiful example of websites that use responsive web design. It's different version than traditional web designing, and developers must know. Being fully adaptive doesn't mean solely being mobile and tablet friendly, it also involves proper display on huge desktop and notebook screens. Responsive web design term is related to the concept of developing a website design in a manner that helps the lay out to get changed according to the user's computer screen resolution. More precisely, the concept allows for an advanced 4 column layout 1292 pixels wide, on a 1025 pixel width screen, that auto-simplifies into 2 columns. Also, it suitably fixes on the smartphone and computer tablet screen. This particular designing technique we call "responsive design". Here are my favorite responsive web design tools sensitive and techniques, it can help web designer to design easy website templates match. These resources have been selected for their ability to help you complete your web designs meet more effective. Initially, a suitable design has been applied to existing screen-centric websites to allow the layout to fit the smaller screen sizes. Development of technology, particularly devices like smartphones and tablets and more and more control introduces a new concept in web design. You may like this: 50+ useful web development tools. Ethan Marcotte de