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Responsive web design: a new type of design for web-based instructional content

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Abstract

As the time passes by, more and more people surf through the Internet using mobile devices compared to a desktop computer. Recently, mobile device and computer screen designers have been trying to provide users with qualified web-browsing but this hasn't been able to afford adequately users' needs that are exposed to traditional website layouts. Therefore, there is a need to switch to Responsive Web Design which is capable of reshaping itself depending on various screen sizes and resolutions from largest screen sizes to smallest on mobile devices. Thus, the users will be exposed to the best experience with content visual display on the device or platform that they are viewing it on. This is more significant when users are studying on instructional web-sites and pages not to decrease their concentration, motivation and performance on their study since the responsive web design automatically change page layout, resize the images or crop them proportionally. In the paper, the authors will inform the audience on Responsive Web Design by indicating an educational web-site as a sample and discuss about its features.

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Keywords: responsive web design, instructional content, web-based

1. INTRODUCTION

Whenever a user enters a website, the most prominent and fundamental thing he looks for is whether he can access all info he required as quickly as he can with minimum effort. This requires provision of the best experience for the user with minimum resizing and scrolling while navigating the site (Sharkie & Fisher, 2013). Mobile device and computer screen designers have been trying to provide users with qualified web-browsing but

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this hasn't been able to afford adequately users' needs that are exposed to traditional website layouts. Therefore, there is a need to switch to a new design which is capable of reshaping itself depending on various screen sizes and resolutions from largest screen sizes to smallest on mobile devices, see Fig 1. Thus, the users will be exposed to the best experience with content visual display on the device or platform that they are viewing it on.

Fig. 1. Mobile devices with various screen sizes and resolutions

The term "Responsive Web Design" was coined by Ethan Marcotte in 2010 on his "A book apart" website. Since then, many projects have been developed using his techniques (Rekhi, 2013). The term is often used to infer the same meaning as a number of other descriptions such as fluid design, elastic layout, rubber layout, liquid design, adaptive layout, cross-device design, and flexible design (Frain, 2012). RWD enables users the best practices while surfing on a website through a multi-device world such as smartphones, tablets, laptop besides desktops. It is time that the web site designs should allow user to respond to any devices like mobiles in portrait and landscape mode, tablets in portrait and landscape mode, laptops, desktops and monitors (Sharkie & Fisher, 2013). Rekhi (2013) states that the designers work is not huge in the development phase of a responsive web site which serves different screen resolutions since with the advent of CSS3 and its design techniques it is becoming easier and easier.

There are three key technical features a responsive web design holds:

- *Media queries and screen resolutions:* A designer should use HTML and CSS3 media queries so that the web site decides how to view the content depending on the screen of each device.
- *Fluid grid layouts*: Responsive web design works on multiple devices by using fluid proportion based grids. It allows the content to resize and rearrange as the percentage-based width of a webpage grid expands or contracts. Therefore, it targets the width of each user's web browser to determine how much space is available and how it should display the website.
- *Flexible images and media*: (through dynamic resizing): The responsive web design automatically changes page layout, resizes the images or crops them proportionally. Thus, there is no need to work on three separate designs for a designer. With the capability CSS3 script language, three dynamic screens are easily designed at one time. For a desktop screen, 1024 pixels width is kept; the same design is rendered on mobile devices (like Ipad) with 768 pixels width and the same design again rendered on smartphones (like Iphone, Galaxy etc.) with 320 Pixels width, see Fig 2.

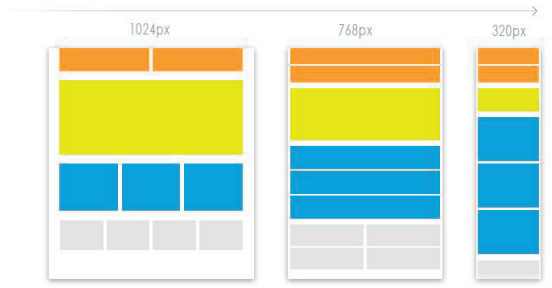

Fig. 2. The blocks depicted for a desktop, an iPad and a smartphone in pixels

All these features should be implemented to have a responsive web design. De Graeve (2011) states that the key point is adapting to the user's needs and device capabilities. Besides, keeping a simple layout and HTML5 code as simple as possible is the first rule and every styling CSS3 and styling information should be removed.

1.1. Advantages of Responsive Web-Design

Some of the prominent advantages of responsive web-design are as follows:

- Broadcasts content on multi-devices at one-time by automatically resizing content to the screen by making it easily readable on every device.
- The content can be degraded if required. For instance we might have some images on a desktop version of our content which we do not want to present on the smartphone size version but the texts or vice versa; or a web page designed for access by smartphone might have fewer menu options than the one of a desktop.
- There is no need to zoom in or out since everything is readable and presented on any screen.
- Easy navigation with the provision of minimum of resizing, panning, and scrolling across a wide range of devices.
- The designer saves time and money by not maintaining a mobile friendly site. There is no need of it.

1.2. Limitations of Responsive Web-Design

Some of the limitations of responsive web-design are indicated below:

- Screen readers which translate web content into audio or Braille for handicapped might be confused by the systems.
- Unfortunately most mobile devices are not compatible with CSS3 media queries and not all browsers (i.e. Internet Explorer) support CSS3. With a Javascript Library Documents; however, this limitation can be eradicated.
- As RWD works on image resizing, the full image is downloaded on a user's device and then resized to fit the screen; sometimes it takes time and impacts performance of the website (Rekhi, 2013).

2. E-learning through Responsive Web Sites

Responsive Web Design offers ways to create a single site that responds dynamically to the devices viewing it. This is more significant when users are studying on instructional web-sites and pages as their concentration, motivation and performance on their study should not decrease while they are studying. While studying on an instructional web site, the audience should not waste their time for navigating, scrolling, paging. This not only effects their learning but also breaks their concentration. Besides, this might create huge "cognitive load" for the audience. Thus, with RWD, web-based instruction;

- is run on a more user-friendly learning environment for the learners,
- is more enjoyable, usable and readable through different mobile devices,
- is more effective since the learners' concentration are not broken and their motivation does not decrease with unnecessary navigation,
- HTML5 eradicates the problem of flash-based content which have often been preferred for the presentation of web-based instructional content.

The same standards and the approach behind Responsive Design are kept to run responsive e-learning. With the developments in HTML5, instructional designers can now develop a single e-learning module which will work on all devices.

3. The Design

The authors of the current study designed a web page depending on the principles of responsive web-design. The web site was in Turkish and about Distance Education.

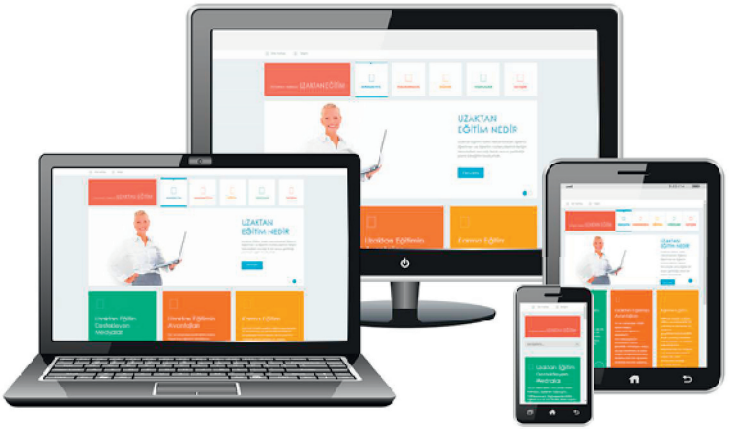

Fig. 3. The same design on a desktop, laptop, iPad and a smartphone

As indicated in Fig 3, the same piece of information is easily accessed on the web site through different devices like a pc, laptop, iPad and a smartphone. All applications present the same content almost in the same format which enable users to access the same piece of information in the same place with the same type of navigation. This facilitates users' work and eradicates time loss while they are looking for the same information on different devices. As seen, this design is more user-friendly.

4. Conclusion

Responsive Web design is still in its early stages, new designs will be offered as more and more screen sizes and form factors arrive, the conversation will continue.

Web designers will continue to offer different opinions and recommend directions related to whether to build for mobile first, how to fit these decisions into the design process, whether to slice up the comps into all the different screen sizes, and so forth. And

HTML5 and CSS3 standards are great help to web designers to deal with these issues. Responsive web design meets the challenges with traditional designs and it's clear that new standards will continue to evolve to handle the changing world of devices and browsers.

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