



Assignment Cover Sheet

Assignment Title:	Identification of suitable web design in World Wide Web: Adaptive and Responsive web design		
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Topic of Interest

Almost everyone who has an internet connection is connected to the internet. According to (siteefy, 2022) calculations, 175 new websites are created every minute! Every day, approximately 252,000 new websites are created worldwide. It is necessary to design a website in accordance with the target user in order to create one. (Ranganathan and Ganapathy, 2002) state that good design is important for businesses to survive in the highly competitive World Wide Web. It has an impact on how your target audience perceives your brand. The impression you make on them will determine whether they stay on your page and learn about your business or leave and go to a competitor. A good web design keeps visitors on your page. A good web design keeps visitors on your page. Thus, web design is critical in order to achieve high levels of satisfaction with the website (Kim and Eom, 2002). A web designer works on the look, layout, and, in some cases, content of a website. For example, appearance refers to the colors, font, and images used. The layout of information refers to how it is structured and classified. A good web design is simple to use, aesthetically pleasing, and appropriate for the website's user group and brand. Many websites are designed with a focus on simplicity in mind, so that no unnecessary information or functionality that may distract or confuse users appears. Because the keystone of a web designer's output is a site that wins and fosters the trust of the target audience, removing as many potential points of user frustration as possible is critical. Responsive Web Design (RWD) and Adaptive Web Design (AWD) are the two methods that are used frequently in web design. AWD is a relatively recent method to progressive website upgrade that emphasizes on accessibility, external style-sheet, scripting tools, and site view vs RWD. This provides for a consistent representation of the site throughout any intended medium and platform, with an upgraded version of pages that is additionally detailed to those with especially sophisticated media for seeing and accessing basic content capabilities. As a result, it has achieved significant advances in design when compared to earlier technologies employed in this industry. Whereas RWD, a relatively new method, targeted at creating a range of sites to finally deliver the best interaction and viewing experience, especially advanced navigation and simple reading with little panning, resizing, and scrolling (Yousaf, 2018).

Problem Statement

The web world's rapidly expanding bandwidth and widespread usage of high-resolution displays urge developers and designers to enhance their websites regardless of web page complexity. While browsing a website, efficiency is vital because it means using the fewest resources possible to obtain the needed information or complete the activity. And a device is required to access the web. It might be a desktop computer, a laptop, a tablet, or a smartphone. However, web designers no longer know what size screen someone could use to see a website (Glassman and Shen 2014). All of these gadget comes with a variety of screen sizes. As a result, the online content layout must be adjusted to accommodate varied screen sizes and resolutions. As a result, instead of directing users with different devices to multiple sites, developers construct websites in such a manner that they can adapt to the devices they're being viewed on. The most apparent possibilities are Responsive Web Design (RWD) or Adaptive Web Design (AWD). Furthermore, numerous concepts and implementation techniques are built on this web design. As a result, developers are left wondering which of the designs to pick. This study examines which web design is superior and what sorts of websites can be produced effectively using different web designs by defining several models and applying methodologies.

Primary Research Question

The main objective of this study is to find solutions to the following research issue using scientific research techniques:

- Which one of the design models will be more acceptable to users?
- What design model is appropriate for modern application?

Objectives

The primary goal of this research is to improve user experience by determining which web design method or model will result in better user-friendly websites. Another objective of our study is to reduce work load on developers.

Hypothesis

In terms of models being used to build an Adaptive and Responsive web design and depending on the user number of using a particular web design, Adaptive Web Design (AWD) has the edge over Responsive Web Design (RWD).

Literature Review

With the increasing complexity of web pages, continually expanding bandwidth and widespread usage of high-resolution screens in the world of the internet motivate designers and developers to improve their websites. Many web-based design have been introduced in the last few years to develop web design. Making a website simple for visitors to view and browse is the same goal shared by responsive and adaptive web design. Both techniques adapt the website's design to the user's device. The RW concept emerged in 2010 by "Ethan Marcotte". Since then, many sites have been developed using it (Wallace, 2007). The fundamental characteristics that define it, such as "fluid, liquid, and flexible design," were widely employed under a variety of titles. The RW is defined by its dynamics, that allow the page's content to be resized and rearranged to fit the available display proportion and the screen size. Two RW features, namely "flexible grid layouts" and "flexible pictures and media," are used to automatically alter web pages. Therefore, only one responsive design can function on the various devices by using "HTML5, & CSS3 script language," removing the need to develop multiple unique designs. AW is another method of building mobile website (Yousaf et al., 2018). The AW was first stated as "progressive enhancement of a website" by web designer "Aron Gustafson." The AW uses java script to ascertain the recipient device's characteristics before uploading the suitable webpage template. To predefine the features of the devices to be considered when designing the site, the AW is concerned. By identifying the user's screen size, adaptive web design (AWD) loads the most suitable site layout. It makes use of a static layout with breakpoints that only function after being loaded. For every adaptive website, web designers create six separate width layouts: 320px, 480px, 760px, 960px, 1200px, and 1600px. The items on the website are shown differently on each device because to this mobile-friendly design approach's static layout for different screen sizes [3]. The main difference between them is that adaptable design allows for the development of various website versions for multiple devices (Pinandito et al., 2017). In comparison to earlier technologies applied in this field of design, it has produced significant advancements in designing. While responsive web design, a more traditional method, aimed to create a wide range of websites to ultimately provide the best interaction and viewing experience,

specifically advanced navigation, and easy reading with the least amount of panning, resizing, and scrolling, and interacting across a multitude of different devices to enhance accessibility, ease of use, and general adaptation of crossing limitations to provide better interface (Yousaf et al., 2019). Software designers can create a Web page that dynamically adjusts to the size of the devices using to responsive design. This approach to development makes it possible for Web pages to be rendered quickly and efficiently, resulting in a positive user experience on mobile, tablet, and desktop platforms. The primary benefits and drawbacks of responsive Web design will be examined in the context of this study. On the other hand, the compatibility with outdated Web browsers, the longer loading time, and the challenges in enhancing user experience are the key drawbacks (Macaulay, 2017). The two terms own a thing in common: they both refer to the process of designing websites that are optimized for the size or kind of device being used to view them. In both cases, the primary objective is to create websites that can be viewed on screens of various sizes. Frequently, it is necessary for the website to display properly on at least three distinct gadgets, such as a small mobile phone, a tablet, or a huge desktop monitor (Rachovski et al., 2021). It is found that the standard web design is unable to meet the requirements of the world's ever-increasing web users. As a result, a mix of AWD and RWD is required to satisfy the technological improvements in WWW. The Responsive design is more user-friendly and favored by users than the Adaptive design, because consumers prefer to visit websites through their smart devices rather than PCs. The main current trend in web design is to create the site starting from the screen of mobile devices and not from the desktop. The importance of the presentation level is justified by user interaction. Responsive web design may not be suitable for all types of websites; thus, various kinds of new technologies are needed to improve it continuously. Adaptive and responsive designs for improving survey quality are among the most promising tools for improving data collection, but they produce marginal reductions in cost and non-response bias. Other issues include weakly predictive auxiliary variables and ineffective interventions and slippage in the implementation of interventions in the field. Although responsive web design maybe is not the best, it is worthy of much attention for researchers to improve the future design (Yousaf et al., 2018).The responsive design approach comes with several benefits. promote responsive web design as an effective strategy for enhancing user experiences. Think of responsive design as a highly adaptable strategy that can be applied to the creation of e-commerce solutions to enhance Consider that responsive design has greatly expanded for the following five fundamental reasons, in that order more traffic from mobile visitors, cheaper website maintenance costs, seamless user experience,

easily adjusts to any screen size. Responsive Web Design (RWD) is taking HTML5 and CSS3 web technologies into account in building a responsive web page or front-end layout. Separate layouts are used in adaptive web design for various screen sizes. The screen size being utilized heavily influences the layout. To put it more simply, the designer will create a layout for each screen size (Macaulay, 2017). RWD web page's screen layout, texts, graphics, navigational elements, video players. A single online document's layout can be created with more flexibility using responsive web design (RWD). When designed properly, responsive web can enhance the overall user encounter. This is the layer at which sites will consider the bandwidth or connection speed of the user in addition to their device and operating system and may entirely disable certain features or change the layout in response. Responsive and adaptive design simply adjusts the site based on how each individual user connects to it (Wallace, 2007). Also, the user's preference is revealed by how often they browse a website and how much time they spend interacting with its material without having to complete any chores. This shows that they favor the website and want to utilize it.

Design Selection

According to Creswell (2002), quantitative research is the process of gathering, analyzing, interpreting, and writing the findings of a study, whereas qualitative research is a different approach to data collection, analysis, and report writing. Considering the methodology used in both of this approaches this research will be followed the Quantitative Research Methodology. The reasons are discussed below.

Design:

Quantitative research approaches seek to promote objectivity, replicability, and generalizability of findings, and are frequently concerned with prediction. Qualitative research methods are concerned with identifying and comprehending participants' experiences, viewpoints, and thoughts—that is, qualitative research investigates meaning, purpose, or reality (Hiatt, 1986).

Deductive:

Whereas quantitative research aims to validate a theory by running an experiment and quantitatively evaluating the findings, qualitative research seeks to develop a hypothesis that explains the observed behavior. In this sense, quantitative research is more deductive, whereas qualitative research is more inductive (Cormack, 1991).

Reliability:

Reliability Quantitative research is thought to be more dependable than qualitative research. This is because a quantitative method seeks to regulate or eliminate superfluous factors within the study's internal structure, and the data obtained may also be evaluated through standardized testing (Duffy 1985)

There are three broad classifications of quantitative research: descriptive experimental and causal comparative (Leedy and Ormrod, 2001). This study will follow the descriptive approach. The descriptive research technique is a fundamental research strategy that investigates the issue as it already exists. Descriptive research is identifying characteristics of a specific phenomenon based on observation or investigating the relationship between two or more occurrences (Williams, 2007).

Research Variables

As the research hypothesis stat that in terms of Models being used to build an Adaptive and Responsive web design and the number of websites using a particular web design, Adaptive Web Design (AWD) has the edge over Responsive Web Design (RWD). Based on that the research variables can be identified. They are:

1. Design
2. Used Model
3. Total implementing websites

Here, web design is the dependent variable which will be affected by the independent variables Models and number of websites that has been build using those models.

Research Scientific Method

Creswell (2002) defined quantitative research as the process of collecting, analyzing, interpreting, and writing the results of a study, which will be used in this study. And every research process is systematic in the sense that it defines the objective, manages the data, and communicates the findings within established frameworks and guidelines (Williams, 2007). All of this is obtained through a step-by-step procedure. Hence, the research method. The diagram depicting those steps is shown below. Furthermore, each step is briefly described.

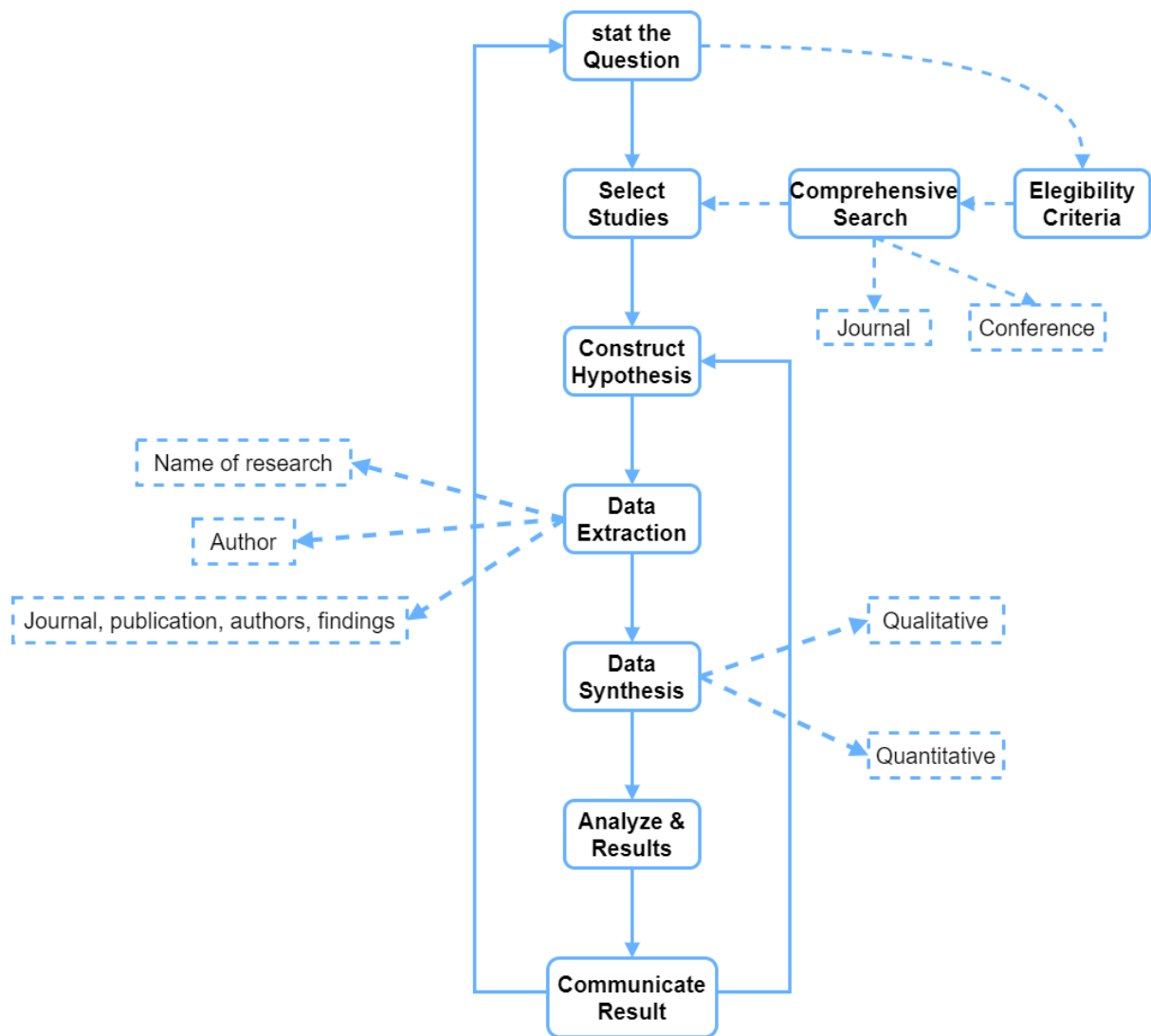


Figure 01: Scientific Method

Step 1: What is the research question?

A good research question is one that is meaningful, relevant, and decisive (Stone, 2002). It is critical to get it right because the research question is the primary driver that "determines the research architecture, strategy, and methodology." (Sackett & Wennberg, 1997). If a method must be chosen in a specific step, having the research question is required. As a result, determining the research question first is essential.

Step 2: Searching criteria, comprehensive searching and select studies

The purpose of study selection criteria is to identify primary studies that provide direct evidence about the research question. To reduce the possibility of bias, selection criteria should be determined during the protocol definition process. (Kitchenham, 2004) In order to

include all the research associated with the research questions need to be identified and to do that comprehensive searching should be done. Several searching field can be considered in the process such as electronic database, registers, journal, registers, patent, conferences etc. However, this research particularly focused on Journals and conferences. All studies that meet the eligibility criteria for inclusion would then be obtained and thoroughly reviewed. To reduce bias, these steps are usually carried out independently by at least two reviewers, who also assign a reason for non-selection to each discarded study. (Ranganathan & Aggarwal, 2020)

After the studies are selected it might be possible to go back and forth between research questions and the selected studies in order to refine the questions as they are the backbone of the research design that is to follow.

Step 3: State Hypothesis

The research hypothesis is a subset of the research question that summarizes the main elements of the study—the sample, as well as the predictor and outcome variables—in a way that provides the foundation for statistical significance tests. For studies that will use statistical significance tests to compare findings across groups, hypotheses are required. (Hulley, 2007)

Step 4: Data Extraction

In order to analyze, the data extraction is required. Data collection forms should provide standard information including:

- Name of Review
- Date of Data extraction
- Title, authors, journal, publication details
- Space for additional notes (Kitchenham, 2004)

Step 5: Data Synthesis

As it is discussed in hypothesis that it creates the foundation to test the research variable with some statistics and try to build correlation between them. Using data synthesis, it is achieved.

Two ways generally all the extracted data can be presented. Qualitative (descriptive) and Quantitative (statistical). This research uses both of the way.

Final Steps: Analyze, Interpret Results and communicate

The final step in the writing process, as with all papers, is to summarize the findings and provide recommendations for future research. (Uman ,2011) Finally, communicate the findings along with the research questions and hypothesis that were stated in order to validate them.

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