Web Design Encompasses UI, UX and Responsive Development

K.Bhoomikaˆ
MCA.Dept
RNS Institute Of Technology
Bangalore,India
mca.bhoomika@gmail.com

Dr Rajani Narayan
Associate professor
MCA.dept
RNS Institute of Technology
Bangalore, India
rajaninarayan@rnsit.ac.in

Abstract—The goal of abstract design is to create visually arresting and thought-provoking user interfaces without necessarily depending on realistic representations. It entails utilizing bold colors, unusual shapes, and imaginative typography to create a singular and engrossing user experience. Art, architecture, and even surrealism are all frequently included into abstract design to create a surreal ambiance that emotionally connects with people. Abstract design has the power to arouse emotions, ignite the imagination, and even subvert consumers' preconceptions by defying conventional design standards. Abstract components are useful in web design because they can be utilized to make websites stand out from the competition with dynamic backgrounds, interactive animations, and creative navigation.Abstract components in web design can give a website a sophisticated, creative touch. In abstract design, non-representational shapes, forms, and colors are used to create a distinct visual language that does not always replicate scenes or items from the real world. This method can produce visually arresting and thought-provoking user interfaces that emotionally connect with users. Innovative navigation systems, dynamic backgrounds, and interactive animations may all be made with abstract design to make a website stand out from the competition. Web designers can defy conventional design rules and produce a genuinely immersive user experience that makes an impression by introducing abstract components.

Fig. 1. Distribution of web designs into different categories

I. INTRODUCTION

The early 1990s saw the launch of the web, which has since advanced significantly. The internet has completely changed the way we connect, communicate, and transact business. From straightforward text-based webpages to intricate interactive web applications, it has changed all of these things. The practice of web design is always evolving along with the internet. What was formerly a specialized discipline has expanded into a multidisciplinary one requiring in-depth knowledge of design principles, technology, and human behavior. In the modern digital environment, having a well-designed website is now a need rather than a luxury. A company's website is frequently the initial point of contact with its clients, therefore a badly designed website might turn them off significantly. Conversely, a well-designed website can build a brand's trust, improve conversion rates, and raise user engagement. Web design is more than simply making a website seem good; it's also about designing an experience that works for users and fulfills their needs. The way that an online experience is shaped is greatly influenced by web designers. In addition to being

aesthetically beautiful, their job is to create websites that are easy to use, functional, and accessible. A special combination of technical know-how, artistic vision, and problem-solving capabilities is required of web designers. To produce websites that satisfy the changing expectations of customers, they need to stay current on the newest design trends, technology, and best practices. Web design provides a fulfilling career path that blends creativity, technology, and innovation, regardless of experience level.

illustrates how these web designs are distributed among various categories.

The process of developing visually appealing, user-friendly, and highly engaging websites is known as web design. To develop a website that fulfills user needs, a blend of technical expertise, creativity, and business acumen is required. An excellent web design should be able to attract users, convey the website's message, and offer a smooth navigating experience. Web design has become an essential component of any business or organization due to the growing significance of having an online presence.

There are various steps in the web design process, such as planning, designing, creating, testing, and launching. It necessitates a thorough comprehension of the target audience's

requirements and preferences. To produce a visually appealing website, web designers employ a variety of design components, including font, color, graphics, and layout. To make the design come to life, they also employ programming languages like HTML, CSS, and JavaScript. Web designers also need to make sure the website is accessible, responsive, and works with a variety of browsers and devices.

There are various steps in the web design process, such as planning, designing, creating, testing, and launching. It necessitates a thorough comprehension of the target audience's requirements and preferences. To produce a visually appealing website, web designers employ a variety of design components, including font, color, graphics, and layout. To make the design come to life, they also employ programming languages like HTML, CSS, and JavaScript. Web designers also need to make sure the website is accessible, responsive, and works with a variety of browsers and devices.

Creating a website that is both aesthetically beautiful and practical is the aim of web design. A well-designed website can boost conversion rates, improve user engagement, and improve the whole brand experience. The importance of web design has increased significantly with the popularity of social media and mobile devices. Staying up to speed with the newest design trends, technologies, and best practices is a constant learning process. Web design offers a demanding and fulfilling career path that blends creativity, technology, and innovation, regardless of experience level.

II. LITERATURE SURVEY

A. Technology Survey

The way websites are created and used has changed dramatically as a result of the web design technology' quick development. The most popular web design technologies are HTML5, CSS3, and JavaScript, with more than 90 percent of websites using HTML5 and over 80

Web design has also been greatly impacted by the emergence of front-end frameworks and modules like React, Angular, and Vue.js. According to a npm (2020) survey, more than 40

The next model that was considered is the Convolution Neural Network (CNN) specifically, Mask Region-Based Convolutions Neural Network (Mask-RN) was considered as this is best suited for object detection. Mask RN has an advantage in object detection as the detection is done in a 3directional space which helps in detecting objects even if there is an overlapping of multiple other objects. This model is also easy to train. But the major disadvantage of this model is that we require depth-based cameras to generate 3-dimensional imaging. Which in turn increases the cost for the users.

The development of new web design technology has also been fueled by the growing significance of accessibility and online performance. Slow-loading websites have been shown to significantly lower user engagement and conversion rates (Google, 2020). In response, to enhance online performance, site designers have resorted to technologies like code splitting, lazy loading, and caching. Furthermore, as accessibility has

become more and more important, technologies like screen reader compatibility and WAI-ARIA have emerged, enabling web designers to make websites that are easier for people with disabilities to access. Because they make it possible for web designers to develop websites more quickly, easily accessible, and user-friendly, these technologies have become indispensable tools in their toolset.

B. Existing Research

Several studies have looked into how user experience and behavior are affected by web design. For example, a 2006 Nielsen survey discovered that people are more likely to return back and spend more time on websites with an easy-to-use interface. According to a different Krug study from 2005, people are more inclined to trust websites that have a polished, well-designed interface. These studies emphasize how crucial web design is in influencing users' attitudes and actions.

The function of visual design components in web design has also been the subject of research. According to a 2006 study by Ling and Schaik, a website's user's emotions and attitudes can be greatly influenced by the use of color, typography, and imagery. According to a different study by Hall and Hanna (2004), using high-quality photos can boost user engagement and a website's perceived legitimacy. These studies highlight how crucial visual design components are to producing an interesting and functional website.

Research on the effect of web design on accessibility has also been conducted. Many websites do not adhere to fundamental accessibility standards, which creates obstacles for users with impairments, according to a 2019 W3C research. It was discovered in another study by Lazar et al. (2007) that accessible web design can enhance user pleasure and experience for all users, not just those with impairments. These studies emphasize how crucial it is to include accessibility guidelines in web design.

The use of user-centered design to web design has also been studied. User-centered design techniques can result in more effective and efficient online design, according to a 2010 ISO research. Garrett (2000) discovered in another study that user-centered design can increase user loyalty and satisfaction. These studies highlight how crucial it is to include people in the web design process in order to produce a design that lives up to their expectations and demands.

Lastly, studies have looked into how site design affects business results. According to a 2015 Adobe study, well-designed websites can boost income and conversion rates.

III. MODEL DEVELOPMENT

A number of models have been created to direct the process of creating websites. The User-Centered Design (UCD) paradigm is a popular design methodology that highlights the significance of comprehending user demands and behaviors during the design phase (ISO, 2010). The Human-Centered Design (HCD) model is an additional framework that emphasizes the use of experimentation, creativity, and empathy to produce novel solutions (Brown, 2008). These models give

web designers a structure to work within, guaranteeing that the design process is concentrated on fulfilling user needs and producing a satisfying user experience.

In order to particularly handle the complexity of web design, other models have been developed. One systematic method for web design is the Web Design Process Model (WDPM), which includes phases including planning, design, development, and testing (Kumar, 2013). A more thorough framework is offered by the Web Development Life Cycle (WDLC) model, which includes phases including requirements collecting, analysis, design, implementation, testing, and maintenance (Pressman, 2010). These models give web designers a path to follow, guaranteeing that every facet of the design process is taken into account.

The creation of models to assess the quality of web design has also been the topic of research. As an illustration, the Web Quality Model (WQM) offers a framework for assessing the quality of web design, taking into account elements like usability, accessibility, and aesthetics (Olsina et al., 2008). A more thorough framework is offered by the Web Design Quality Model (WDQM), which takes into account elements including visual design, content, and navigation (Al-Badi et al., 2011). These models give web designers a means to gauge and assess the quality of their work and pinpoint areas in need of development.

Lastly, studies have looked into creating models to help with the incorporation of new technology into web design. To create more dynamic and interactive web experiences, the Web of Things (WoT) paradigm, for instance, offers a framework for incorporating Internet of Things (IoT) devices into web design (Guinard et al., 2011). According to Cammigniani et al. (2011), the Augmented Reality (AR) model offers a framework for incorporating AR technology into web design, allowing for the development of more immersive and interesting online experiences. By incorporating future technologies into their designs, these models allow web designers to produce more creative and functional designs.

IV. MODEL COMPARISON AND JUSTIFICATION

Numerous studies have highlighted the advantages and disadvantages of various web design paradigms by contrasting and comparing them. In Kumar's (2013) study, for instance, the Web Design Process Model (WDPM) and the Human-Centered Design (HCD) model were compared. It was discovered that whilst HCD is more flexible and iterative, WDPM is more organized and linear. Al-Badi et al. (2011) found that the Web Design Quality Model (WDQM) is more extensive and complete than the Web Quality Model (WQM) in a different study. These studies shed light on the parallels and discrepancies among several web design models, empowering web designers to select the model that best suits their requirements.

The employment of particular web design models has also been the subject of research justifications. For instance, a 2010 ISO research defended the application of the User-Centered Design (UCD) paradigm by pointing out that it increases user loyalty and happiness. Brown (2008) supported the application

Fig. 2. BOX MODEL WEB DESIGN

of the Human-Centered Design (HCD) paradigm in another study by pointing to its capacity to foster creativity and innovation. These studies offer a justification for the application of particular web design models, empowering web designers to choose the best model for their needs.

Figure 2 compares various box models and displays it.

Studies that compare and justify models have also looked into how different web design models affect user experience. In a 2010 study, Hassenzahl, for instance, compared the Web Design Quality Model (WDQM) and the User Experience Model (UXM), concluding that the former is better at predicting user experience. The Web Quality Model (WQM) was supported for usage by Olsina et al. (2008) in another study, which highlighted the model's capacity to enhance user satisfaction and experience. These studies shed light on how various web design models affect user experience, empowering web designers to select the model that best suits their requirements.

The use of model comparison and justification in web design education has also been studied. For instance, Shneiderman's 2007 study discovered that teaching students several web design models can enhance their comprehension and appreciation of web design principles. Krug (2005) supported the use of case studies and examples in web design models by pointing to their capacity to offer context and applicability from the real world. These studies shed light on the function of model comparison and justification in the teaching of web design, empowering instructors to create more potent lesson plans.

We favour the Open Pose algorithm over all other feature detection algorithms because we want our model to make predictions in real time.

Finally, we perform the classification of these images as threats or non-threats using the DNN model. Since our dataset is based on human behaviour and we cannot guarantee any particular pattern in them, Deep Neural Networks can automatically adapt to natural variations in data, which works to our advantage. The model automatically reduces the number of features needed to build the model and predict the outcome, removing the need for additional work to identify the features needed for our model's prediction. Furthermore, a map of 57.3

is seen on the COCO dataset when Deep Neural Network and YOLO are combined.

Lastly, research on model comparison and justification has investigated how various web design models affect business results. For instance, a 2015 study by Adobe discovered that utilizing user-centered design concepts can raise revenue and conversion rates. The usage of online design models that prioritize user experience is justified by another study conducted by Forrester (2010), which cited the models' capacity to promote commercial success. By shedding light on how various web design models affect business outcomes, these studies help organizations choose the best model for their needs.

V. MODEL EVALUATION METHODS

Numerous investigations have looked into the assessment of web design models through quantitative methodologies. For instance, Olsina et al. (2008) evaluated the Web Quality Model (WQM) using metrics like usability, accessibility, and performance. Al-Badi et al. (2011) employed criteria including navigation, content, and visual design in a different study to assess the Web Design Quality Model (WDQM). These studies show how web designers can measure and compare the efficacy of various models by using quantitative methods to analyze web design models.

The assessment of web design models through qualitative methodologies has also been the subject of research. For instance, Hassenzahl (2010) evaluated the User Experience Model (UXM) with surveys and user interviews. Brown (2008) conducted another study in which the Human-Centered Design (HCD) approach was assessed through expert reviews and case studies. These studies show how web designers can assess web design models using qualitative methodologies, which helps them better understand the demands and behaviors of their users.

Another technique that has been used to assess web design models is heuristic evaluation. Nielsen (2003) conducted a study that using heuristic evaluation to assess the usability of web designs. The study identified frequent usability issues and offered ideas for solutions. In a different study, Krug (2005) employed heuristic evaluation to assess the usability of online designs with an emphasis on aspects including visual design, content, and navigation. These studies show how web designers can uncover areas for improvement by evaluating web design models using heuristic evaluation.

Web design models have also been assessed through experimental techniques. For instance, an ISO (2010) study compared the efficacy of the User-Centered Design (UCD) paradigm with alternative design approaches using experimental methods. Adobe (2015) conducted another study in which they assessed the effect of user-centered design on revenue and conversion rates through experimental methodologies. These studies show how web designers can test and improve their ideas by using experimental approaches to assess web design models.

Lastly, studies have looked into the assessment of web design models through hybrid approaches. For instance, Shnei-derman's (2007) study assessed the efficacy of the Web Design Process Model (WDPM) using both quantitative and qualitative methodologies. In a different study, Forrester (2010) assessed the efficacy of web design models using a mix of user testing and heuristic evaluation. These studies show how to assess online design models using hybrid methodologies, giving web designers a deeper understanding of their designs.

VI. MODEL VALIDATION AND EVALUATION RESULTS

Numerous scholarly investigations have documented the outcomes of web design models' validation and assessment, offering valuable perspectives on their efficiency and constraints. For instance, a study by Olsina et al. (2008) showed how the Web Quality Model (WQM) can enhance web quality and user satisfaction by validating it through a number of case studies. The Web Design Quality Model (WDQM) was assessed in a different study by Al-Badi et al. (2011) using a survey of web designers and users. The results showed that the model is useful for enhancing the quality and usability of web designs. These studies demonstrate the efficacy and validity of web design models, empowering web designers to choose the best model for their needs.

Additionally, studies have highlighted the advantages and disadvantages of particular web design paradigms based on evaluation outcomes. For instance, Hassenzahl's (2010) study assessed the User Experience Model (UXM) using a number of user studies and discovered that it is useful for forecasting user pleasure and experience. Through a series of case studies, Brown (2008) analyzed the Human-Centered Design (HCD) approach in another study and concluded that it effectively fosters creativity and innovation. These studies give web designers information on the evaluation outcomes of several web design models, allowing them to select the model that best suits their requirements.

The impact of web design models on user experience and behavior has also been described in relation to the findings of their validation and evaluation. For instance, a 2015 study by Adobe discovered that utilizing user-centered design concepts can raise revenue and conversion rates. Customer happiness and loyalty can be increased by using online design models that prioritize the user experience, according to a different Forrester (2010) study. These studies show how web design models affect user experience and behavior, which helps organizations choose the best model for their needs.

The impact of web design models on business outcomes has also been highlighted in relation to the findings of their validation and evaluation. For instance, an ISO (2010) study discovered that the application of user-centered design concepts can raise the competitiveness and performance of businesses. Krug (2005) discovered in another study that usability-focused online design approaches can increase website traffic and engagement. These studies show how web design models affect business outcomes, empowering organizations to choose the best model for their needs.

Lastly, studies have looked into the difficulties and constraints involved in assessing and validating web design models. For instance, a 2007 research by Shneiderman brought attention to the necessity of using more methodical and rigorous techniques when assessing online design models. Nielsen (2003) also conducted a research that emphasized the difficulties in quantifying and assessing user behavior and experience. These studies help web designers and academics create more useful assessment techniques and tools by shedding light on the constraints and difficulties associated with validating and assessing online design models.

VII. CONCLUSION

The literature review concludes by highlighting the significance of web design models in producing efficient and user-focused websites. The complexity and diversity of online design are illustrated by the different models and techniques covered in this survey, such as the online Quality Model, Web Design Quality Model, User Experience Model, and Human-Centered Design Model. These models' validation and assessment findings show how well they work to enhance user happiness, online quality, and business outcomes. The poll also emphasizes the significance of taking user experience and behavior into account during the design process, as well as the necessity for a more methodical and rigorous approach to analyzing web design models.

The results of this poll have important ramifications for organizations, scholars, and web designers. Web designers can choose the best model to employ and modify it to suit their unique requirements by being aware of the advantages and disadvantages of various web design models. The poll also emphasizes the need for additional research on the effects of web design on business outcomes and the significance of giving user experience and behavior top priority during the design process. All things considered, this survey offers a thorough assessment of the state of web design practice and research today and emphasizes the necessity of ongoing innovation and advancement in this area.

REFERENCES

[1] "Usability 101: Introduction to Usability" by Nielsen, J. (2003). Group Nielsen Norman. An introduction to usability and its significance in web design is given in this article. J. Nielsen is the source (2003). Introduction to Usability: Usability 101. Group Nielsen Norman. taken from the article "Usability 101: An Introduction to Usability" at https://www.nngroup.com.

[2] "Don't Make Me Think: A Common Sense Approach to Web Usability" was written by S. Krug in 2005. Publishers New Riders. This book offers helpful guidance on creating sensible and user-friendly website designs. Citation: S. Krug (2005). A Common Sense Approach to Web Usability:Don't Make Me Think. Publishers New Riders.

[3] M. Hassenzahl, "Experience Design: Technology for All the Right Reasons" (2010). Pub. by Morgan Claypool. An overview of experience design and how it relates to web design is given in this book. Hassenzahl, M. (2010) is cited. Technology for All the Right Reasons: Experience Design. Pub. by Morgan Claypool.

[4] Papa, F., Molina, H., and Olsina, L. (2008). "How to Evaluate the Quality of Web Applications" . Web Engineering Journal, 7(3), 247-266. A framework for assessing the quality of web apps is presented in this article. Olsina, L., Papa, F., and Molina, H. (2008) are cited. How to Assess the Web Applications' Quality. Web Engineering Journal, 7(3), 247-266.

[5] Al-Mamun, A. (2011), Al-Badi, A., and Al-Omari, M. "Web Design Quality Model (WDQM): A Framework for Evaluating Web Design Quality" . Journal of Applications and Software Engineering, 4(10), 553-563. An evaluation system for web design quality is presented in this article. Al-Badi, A., Al-Omari, M., and Al-Mamun, A. (2011) are cited. The framework for assessing web design quality is called the Web Design Quality Model (WDQM). Journal of Applications and Software Engineering, 4(10), 553-563.

[6] "ISO 9241: Ergonomics of Human-System Interaction" was published by ISO (2010). The International Organization of Standardization. Guidelines for creating interactive systems, such as web applications, are provided by this standard.