

Analyzing the User Experience: A Comprehensive Assessment of Visual Design Elements in Artificial Intelligence Generated Interfaces and Strategies for Enhanced Accessibility

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Abstract: This study examined how artificial intelligence (AI) techniques affect the creation of user-friendly mobile application interfaces. This study examined the effectiveness of incorporating accessibility standards into AI-generated user interfaces. There were two stages to the research. In the first phase, an AI tool was chosen, and by providing various prompts, various interfaces for a mobile application for food delivery were developed. In the second step, experts and users (older persons) assessed the AI-generated interfaces to see how the accessibility features were implemented. The outcome led to the selection of a certain interface, which was then manually constructed using guidelines to incorporate all the accessibility aspects. Once more, users and specialists participated in the testing to gauge the existence of accessibility. Using this procedure, the effectiveness of both manual and AI-generated user interfaces in integrating accessibility elements was assessed. All of these measurements' results showed that manually created interfaces had more accessibility features than AI-generated ones. To create efficient AI-generated interfaces with accessibility features, more research must be done on the subject and better models and prompts are required to support the functioning.

Keywords: Accessibility; Inclusive design; Artificial Intelligence; AI generated interfaces; User Experience Design, User Interface

I. Usability and Inclusive Design

Usability is defined by the International Standards Organisation (ISO) as the degree to which a product may be used by designated users to accomplish particular goals in a designated context of use with efficacy, efficiency, and satisfaction (Barnum & Dragga 2001; ISO 1999). Ensuring the website is both helpful and easy to use for the target user base is essential to usability (Murray & Costanzo 1999). What makes a web interface "usable" is still up for debate. All agree, however, that an interface that is clear, straightforward, navigable, consistent, appealing, accessible, and forgiving of user errors is useful. Research has indicated that roughly 60% of the time, users are unable to locate the information they are looking for on websites (Brinck et al. 2001). Time is lost, productivity is decreased, and irritation levels rise as a result. High usability is the key factor in achieving maximum return on information technology investment by a corporation (Brinck et al. 2001).

Metrics related to accessibility are crucial for a variety of situations and goals. It is the primary determinant of interface usability (Martins & Duarte 2022). Another area where accessibility is crucial is in inclusive design. Universal design and design for everyone are related to inclusive design, however inclusive design also needs to define "reasonable" in its definition. The design process must constantly adapt to accommodate a diverse range of users as we gain a deeper understanding of their needs, desires, and expectations to achieve the goal of creating beautiful and functional environments that everyone, regardless of age, gender, or disability, can use equally (Shipley 2002).

Accessibility Criteria's

There are different accessibility standards are followed worldwide. The prominent standards followed in the industry include Web Content Accessibility Guidelines (WCAG), Americans with Disabilities Act (ADA), Material Design Accessibility guidelines, Apple Design Accessibility guidelines, and the Accessibility for Teams - An official website of the United States government. Based on these standards, a few accessibility factors are found to be important to consider when studying the accessibility in the interfaces. They are color contrast, hit target sizes, fonts, buttons, iconography, white space, and visual hierarchy.

The results of Hill & Scharff's (1996) study, which examined the effects of six foreground/background color combinations, suggested avoiding sharp contrasts by showing that participants responded quickly to a median color contrast combination (green and yellow had the fastest response time). Flanders (2002) advises limiting the number of text colors since the user becomes confused when colors are mixed. Instead, she suggests utilizing contrasting backgrounds and text colors.

Important components of interface design that have a big impact on usability and user engagement are buttons and hit target sizes. Buttons should have a distinctive look that makes them identifiable as interactive elements, according to Johnson & Jeff (2000). The region of a clickable element that facilitates user interaction is referred to as the hit target size. The size and distance of the objective from the beginning point affect the amount of time needed to approach it, according to Fitts' law, a well-known principle in human-computer interaction (Fitts 1954). Fitts' law has been applied to interface design with validation from multiple studies, which show that larger hit target sizes result in faster and more precise pointing movements. According to Chapuis

et al. (2011), enlarging interactive features, such as buttons, enhanced user performance and decreased errors. They suggested that for touch interactions to be comfortable, the goal size should be at least 9mm. Similarly, Wobbrock et al. (2008) suggested that desktop interfaces have a minimum target size of 9.2 mm.

Another crucial factor in assessing accessibility is font size. The legibility, reading duration, and general font preference for two font types—sans serif and serif—were investigated by Bernard et al. in 2001. The 12- and 14-point font sizes were shown to be significantly preferred for elderly persons (aged 63 to 82). Additionally, it has been noted that serif fonts are better than sans-serif fonts. According to research by Ivory and Hearst (2002), larger font sizes should be used to improve the appearance of the content page.

Icons can improve information identification, retention, and comprehension, making interfaces more user-friendly and effective (Dey et al. 2011). They make it easier to navigate, offer visual signals, and clearly and concisely communicate ideas. Tahir et al. (2018) stress how crucial it is to create visually striking icons, a good representation of the ideas they convey, and cohesive with the interface's overall design language. The effects of various icon styles on user perception and recognition have been studied. For instance, Hsu et al. (2014) examined the efficacy of flat icons, which have a basic, minimalistic look, and skeuomorphic icons, which mimic real-world things. They discovered that consumers could identify and comprehend flat icons with fewer details more quickly. Additionally, where icons are placed inside the user interface has a big impact on how users engage and behave. According to research by Coursaris et al. (2008), users' performance and efficiency when performing activities can be improved by placing icons strategically, such as in the upper left corner or at the top of the screen. Effective iconography is a result of designing icons that are understandable, relevant, and visually distinct as well as taking accessibility issues into account and placing them inside the interface.

The empty or vacant spaces that exist between design elements on a web page are referred to as "white space," often known as "negative space," and are a key interface design principle. White space is essential for enhancing the readability and comprehension of interface material, according to Tullis & Kodimer (2014). Nielsen (2010) provides additional evidence in favor of the theory that white space improves reading comprehension by lowering the cognitive load and offering visual pauses that facilitate the processing of information. When used appropriately, white space can draw users' attention to key components and calls to action on an interface, as well as enhance its visual appeal (Landa 2014; Kim & Moon 2018). Additionally, it will contribute to improving the interface's dependability and quality (Kurniawan & Zaphiris 2001).

In graphic design, the idea of directing attention is referred to as building a strong "Visual Hierarchy." When a human looks at a design initially and then again, elements like text style, color, and size are thought to have the most influence (Djamasbi et al. 2011). According to Faraday's (2000) research, an interface's elements' position, size, image, color, and text style can all predict their sequence and affect a user's experience. Still (2018) argues that when establishing the hierarchy in a design, text style is just as important as position. Looking back, a lot of research assumes that visual hierarchy is a real idea, but it hasn't been proven to have an impact on the viewing experience. Additionally, according to Still (2018), designers can assist viewers in navigating a design or layout more easily by drawing their attention to specific components that support a more obvious hierarchy of crucial information. Fluency, also referred to as ease in a scenario, is a pleasant and good feeling that may be developed by visual hierarchy (Reber et al. 2004).

Artificial Intelligence (AI) & Accessibility in UX

User experience design is only one of the areas that artificial intelligence (AI) has revolutionized. The nexus between AI and UX design offers fascinating opportunities to develop intelligent, personalized, and seamless user experiences. AI technology may significantly improve the design process and optimize user interactions because of its capacity to analyze enormous volumes of data, recognize patterns, and make well-informed conclusions.

AI-generated interface accessibility is an important factor that requires careful thought. Even though AI technology presents innovative possibilities for interface design and creation, it is crucial to guarantee that the final products are user-friendly.

Accessibility and Its Importance to People with Special Needs

People with disabilities can access and use digital products, services, and interfaces on an equal basis with others because of accessibility in design (Martins & Duarte, 2022). According to a study on web accessibility, "websites need to be designed and developed to support usability across these contexts; to achieve this, websites need to be accessible to all users, particularly those who are older and disabled (Petrie et al. 2015)." It is an essential component of inclusive design as well as a necessity under ethical and regulatory guidelines. UX designers can develop experiences that are useful, straightforward, and engaging for all users, regardless of their abilities or impairments, by considering accessibility and applying it from the beginning.

In UX design, accessibility is more than just following rules and regulations. It involves developing an awareness of users' varied demands, capacities, and constraints. Different people have different levels of vision, hearing, mobility, cognitive ability, and other variables that can affect how they engage with digital interfaces. A truly accessible user experience takes these differences into account. The substantial global population impacted by impairments emphasizes the importance of accessibility in UX design. The World Health Organisation (WHO, 2001) estimates that over a billion people, or 15% of the world's population, are disabled in some way. A significant section of the population is prevented from fully engaging in the digital sphere

when accessibility issues are not adequately addressed, which restricts their access to opportunities, services, and information. Furthermore, the advantages of accessibility go beyond those who are disabled. Think about the elderly population, where aging-related changes might impact cognitive, motor, hearing, and vision capacities. UX experts may improve usability for a wider audience (i.e., for all possible users) by designing with accessibility in mind. This allows them to create interfaces that cater to the demands of older users (Gregor et al. 2022)

Need for The Study

Although there are established accessibility standards and principles, they might not fully account for the particular difficulties and factors that AI-generated interfaces present. It is crucial to recognize the need for accessibility improvements and to address any potential obstacles experienced by users, particularly those with impairments, as AI technologies advance and become more widely used.

AI-generated interfaces have the potential to completely transform how humans interact with technology, but their reliance on machine learning algorithms and other automated processes, which might not have been designed with accessibility as a top priority—presents special accessibility challenges. Under such circumstances, these interfaces might uphold current disparities and marginalization of those with disabilities, restricting their capacity to fully engage in society. Therefore, there is a need for research to evaluate and understand the methods to improve the accessibility of AI-generated interfaces.

II. Objectives

The purpose of this study is to investigate and assess the accessibility of AI-generated interfaces as it stands right now. It looks for ways to improve the design of AI systems that prioritize inclusion and accessibility by identifying the gaps, problems, and opportunities already present. The goal of this research is to improve the accessibility of AI-generated interfaces by examining the relationship between AI and accessibility. The main objectives of the study are,

- To evaluate and compare the accessibility of different AI-generated interfaces
- To manually improve the accessibility of an AI-generated interface to meet accessibility guidelines and standards
- To understand the scope for improvement in the area of Accessibility in AI-generated interfaces by comparing the accessibility score of the improved interface with the AI-generated interface.

III. Methods and Procedure

An experimental study design has been used in this research to better understand how AI affects user interface accessibility. There were two stages to this. The purpose of phase one is to determine how well an AI tool generates interfaces that meet accessibility standards. Phase 2 involved a testing strategy with two groups, including older visually challenged persons and design professionals, to see how the interfaces created by AI and manually modified versions differed and could be useful for the special needs user group.

The AI tool for the study was chosen in Phase I. MidJourney is the AI tool that was selected for this study's analysis. MidJourney is an artificial intelligence tool for creating photographs. It receives human input in the form of written prompts, parameters, and other images, and then utilizes a machine learning algorithm that has been trained on a vast amount of image data to create original images. One of the most widely used AI tools in the industry for creating AI interfaces is MidJourney. The volume of blogs, YouTube videos, and other content accessible by utilizing the tool to quickly and attractively create user interfaces is proof of this. Mid Journey offers both a premium subscription model and an open-source version. For the investigation's purposes, a Basic paid package was subscribed to generate AI Interface images.

The testing procedure was carried out in phase two. Seven adults between the ages of 50 and 60 were selected as the target group to concentrate on the visual design components impacting visual accessibility since they represent a segment of the population with visual ability issues. Before scoring was generated, experts and users individually tested the AI-generated interfaces. Next, with the assistance of a design professional, the interface was manually modified. It was then tested once more with both experts and users. This was done to comprehend the distinctions between humanly developed interfaces and AI from the perspectives of professionals and users.

Accessibility Metrics Used

The industry-wide accessibility standards from five different organizations were the basis for the metrics that were used to measure the accessibility elements in the interface design. These include the Americans with Disabilities Act (ADA), the Web Content Accessibility Guidelines (WCAG), the Material Design Accessibility Guidelines, the Apple Design Accessibility Guidelines, and the Accessibility for Teams website, which is an official US government website.

The parameters of the study were established following the accessibility guidelines established by these five businesses. The accessibility components, which range from cognitive to physical accessibility, make up the parameters. The study's finalized parameters are as follows:

- Color contrast - Meet a 4.5:1 color contrast ratio regardless of what size your text is. (Web Content Accessibility Guidelines (WCAG))
- Hit target size - A good size to remember is 44 x 44 pixels, for all hit targets. (WCAG/Apple design guidelines)
- Text on image - Don't use images of text on your website except where necessary or for branding purposes, for example, your logo. (Web Content Accessibility Guidelines (WCAG))
- Font size - Min 16px (Americans With Disabilities Act (ADA))
- Line width - 45-75 characters per line is acceptable and approximately 66 characters per line is comfortable. (Accessibility for teams)
 - Icons with text
 - Legible font
 - White space
 - Single Hand accessibility
 - Visual Hierarchy

Testing Procedure

Understanding users as they carry out tasks is the primary goal of usability or user testing. It is a methodical approach to seeing real people utilize a product and gathering data on the particular ways that the product is simple or complex for them (Dumas & Redish 1999). To find usability issues and progressively enhance the relevant product, an iterative cycle of tests can be carried out (Rubin & Chisnell 2008). To determine the accessibility efficiency, two groups of participants were tested in this study. The two methods are user testing and manual testing. By evaluating the user interface with a design professional, the manual testing method aims to promote usability by identifying problems or opportunities for improvement in the interaction (Gray & Salzman 1998). To ascertain how the user interfaces created offer accessibility from the user's point of view during their interaction with the product, user testing techniques were conducted with the target population (Nielsen & Mack 1994). The expert testing process used the evaluator-based usability evaluation approach, whereas the user group testing method was based on the principles of Hasan et al. (2012).

Additionally, the criteria were divided into two categories. While some of the other parameters were arbitrary and had no set norms, the two-group classification was carried out using the stated design compliance guidelines/criteria, which could be manually evaluated. As a result, the target (user) group is required to be used for testing. They are,

- Manual (Expert) Testing method:
 - Color contrast
 - Hit target size
 - Text on image
 - Font size
 - Line width
 - Icons with text
- User Testing method:
 - Legible font
 - White space
 - Single Hand accessibility
 - Visual Hierarchy

Evaluation criteria

After the parameters were established, a scoring system was developed to put them into numbers. For each of the two techniques, the parameters were scored independently. For manual testing, a score of one point was awarded to each parameter that satisfied the necessary criteria. The parameters that did not meet the standard received a score of zero.

Table 1 Accessibility metric for manual testing

Parameter	Standard	Score
Color Contrast	4:5:1 color contrast ratio	Yes - 1; No - 0
Hit Target Size	40 - 44 px	Yes - 1; No - 0
Text on Image	No text on the image	Yes - 1; No - 0
Font Size	Min 16 px	Yes - 1; No - 0
Line Width	45 - 75 characters per line	Yes - 1; No - 0
Icons with Text	Custom icons supported with text	Yes - 1; No - 0

For user testing parameters, the users were asked to rank the parameter on a scale of 0-2, 0 being bad, 1 being neutral, and 2 for good.

Table 2 Accessibility metric for user testing

Parameter	Score
Legible Font	0 - Bad; 1- Neutral; 2- Good
White Space	0 - Bad; 1- Neutral; 2- Good
Single Hand Accessibility	0 - Bad; 1- Neutral; 2- Good
Visual Hierarchy	0 - Bad; 1- Neutral; 2- Good

Accessibility Score Computation Method

The accessibility score of all the interfaces was computed using the following formula:

$$\text{Accessibility Score} = \frac{Y * MTS_x + \sum_{y=1}^Y UTS_y}{Y}$$

- where Y refers to the total number of users = 7,
- x is a number between 1 - 5 representing the interface,
- y is a number between 1 - 7 representing the current user.
- MTS refers to Manual Testing Score
- UTS refers to User Testing Score

Figure 1, represents the graphical illustration of how the scores were computed from the prompt-generated interfaces



Figure 1 Graphical representation of flow to compute Accessibility Score.

IV. Results of AI-Generated Interfaces

Generating AI interfaces

Five UI/UX designers were asked to give prompts to generate accessible interfaces for a food ordering application for the target group. The related prompts and generated interface are discussed below.

Interface 1

UI design for a food delivery app Home Screen that can be easily accessible by a single hand following Web Content Accessibility Guidelines (WCAG)



Figure 2 AI Generated Interface 1

Interface 2

UI design for a food delivery app with contrast ratio 4:5:1, white space, dark font, button size: 40px, screen resolution: 828px × 1792px



Figure 3 AI Generated Interface

Interface 3

A UI Screen for a food delivery mobile app, Material Design guidelines, Web Content Accessibility Guidelines, all mobile app accessibility guidelines.



Figure 4 AI Generated Interface 3

Interface 4

Homepage UI for a food delivery app, clear images, no text on images, 40px buttons, font size: 16px, Background color: Fore-ground color:: 3: 1 for iPhone XR screen



Figure 5 AI Generated Interface 4

Interface 5

UI Screen for a food delivery mobile app, Material Design guidelines, Web Content Accessibility Guidelines, all mobile app accessibility guidelines



Figure 6 AI Generated Interface 5

The above section displayed the outcomes of the five expert-given prompts as well as the interface produced by the MidJourney AI tool. To provide accessibility for a single-hand follower and convey the result, the first prompt was specifically designed to adhere to the WCAG requirements. There were certain accessibility needs for Prompt 2. To comply with all mobile application accessibility rules, Prompts 3 and 5 were provided. There were specifications for the iPhone screen in Prompt 4. The specialists formulated the prompts to provide an interface based on distinct criteria tailored to various settings.

Manual (Expert) Testing Results for AI-Generated Interface

To evaluate AI generated interface firstly, the expert testing result was identified through MTS value. It is found that the values range from 1 to 3 for all the interfaces. None of the AI-generated interfaces has the full value of 6. It is also proven that hit target size and font size were not at all considered by the AI tool while generating the interface. Color contrast is also not considered widely. The line width is incorporated by the AI tool in 5 interfaces out of 6. This shows that the improvement in AI-generated interface is still needed in many categories of accessibility.

Table 3 Expert test result of AI-generated interface

	Color contrast	Hit size target	Text on image	Font size	Line width	Icons with text	MTS Value
Interface1	0	0	0	0	1	0	$MTS_1 = 1$
Interface2	0	0	1	0	1	1	$MTS_1 = 3$

Interface3	0	0	1	0	0	0	$MTS_1 = 1$
Interface4	1	0	0	0	1	0	$MTS_1 = 2$
Interface5	0	0	1	0	1	1	$MTS_1 = 3$

User Testing Results for AI-Generated Interface

To evaluate the user testing results, the UTS score was computed. The total score point is 56 to consider the best incorporation of accessibility in interfaces. The UTS value of the AI-generated interface in this research ranges from 24-28. This shows that the average 50% score itself cannot be matched by the interfaces. Comparing the four criteria used in user testing, based on the value it is proven that legible font is the main problem followed by visual hierarchy, white space, and single-hand accessibility. The result of user testing is also in line with expert testing.

	Interface 1				Interface 2				Interface 3				Interface 4			Interface 5				
	LF	WS	SHA	VH	LF	WS	SHA	VH	LF	WS	SHA	VH	LF	WS	SHA	VH	LF	WS	SHA	VH
U 1	0	1	0	2	1	0	0	1	1	0	0	1	1	2	1	0	1	2	1	1
U 2	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	2	0
U 3	1	2	1	1	1	2	1	1	1	2	1	1	0	2	2	0	1	2	1	1
U 4	0	1	1	1	0	1	2	2	0	1	2	2	1	2	2	0	0	1	2	2
U 5	1	2	0	2	0	1	1	1	0	1	1	1	0	2	1	1	0	1	1	1
U 6	0	2	0	2	0	1	0	1	0	1	0	1	0	1	2	0	1	2	1	0
U 7	0	1	0	1	1	1	1	1	1	1	1	1	0	2	1	1	0	1	2	0
UTS Value	25				24				28				27			28				
Note: U- User, LF – Legible Font, WS – White Space, SHA – Single Hand Accessibility, VH- Visual Hierarchy																				

Figure 7 User Testing results of AI-generated interface

Accessibility Score for AI interface based on MTS & UTS value

Here the total accessibility score was computed based on the UTS and MTS value calculated based on testing. The five interfaces' accessibility scores fell between five and seven points, and there was no relationship between them and the accessibility prompt's level of complexity. This leads to the conclusion that the AI tool does not currently consider accessibility when creating interfaces using its algorithm.

Table 4 Accessibility Score

Interface	Accessibility Score
Interface 1	4.6
Interface 2	6.4
Interface 3	5
Interface 4	5.9
Interface 5	7

To evaluate the potential for accessibility in AI-generated interfaces to be improved. The accessibility score, which is covered in the next part, was calculated by personally improving and retesting the interface with the greatest accessibility score.

Result of Manually Generated Interface

Designing Interface Manually

The AI-generated interface with the greatest accessibility score was selected, and its accessibility requirements were manually adjusted. This process involved calculating the accessibility scores for each AI-generated interface. The following adjustments were made as per the industry standard guidelines mentioned above:

- Using a contrast checker & adjusting color
- Increasing font size

- Increasing and matching the hit size of all clickable elements
- Changing to more legible fonts (Inter)
- Increasing white space

After implying the changes, the following interface (figure 2) was designed by the designer manually for further testing

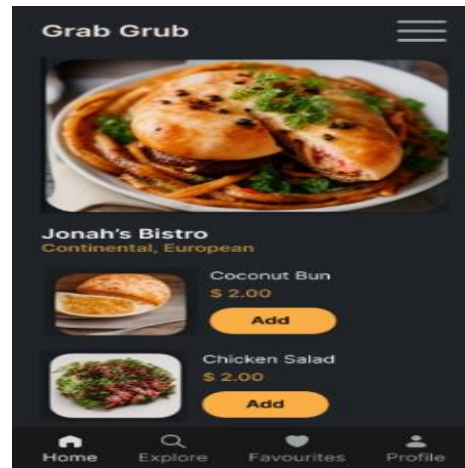


Figure 8 Manually Improved Interface

Manual (Expert) & User Testing Results for Manually Generated Interface

The manually enhanced interface's accessibility score rose dramatically from 7 to 13 points. When compared to AI-generated interfaces, there is room for development in terms of accessibility, as evidenced by the notable rise in accessibility score. The MTS value of expert testing also shows that all the improvisations related to accessibility in the interface is better in manual design.

Table 5 Expert Testing result of manual design

	Color contrast	Hit target size	Text on image	Font size	Line width	Icons with text	MTS Value
Improvised Interface	1	1	1	1	1	1	6

Table 6 User Testing result of manual design

	LF	WS	SHA	VH	UTS Value	Accessibility Score
User 1	2	2	2	2	49	13
User 2	1	2	2	2		
User 3	2	1	2	1		
User 4	2	2	1	2		
User 5	2	2	2	2		
User 6	1	2	2	2		
User 7	2	1	1	2		

Artificial intelligence (AI) algorithms can also be easily programmed and trained to improve the accessibility of the interfaces they generate, since manually improving the interface mostly involves making sure the parameters adhere to the current accessibility standards and do not require any creative or intellectual effort from the designer.

By altering the code to make sure that the parameters adhere to accessibility standards and norms, AI algorithms can be developed to create accessible interfaces. Although these code modifications might not fully render the final design accessible, they can undoubtedly contribute to increasing the accessibility of the interface's visual features.

V. Discussion

The purpose of this study was to comprehend the current state of AI tools for creating user interfaces. For this reason, the AI-generated interfaces were created using the currently widely utilized technology, Mid Journey. To confirm that the interfaces adhered to the accessibility criteria, both experts and users tested them. These inputs were used to manually improve and retest the interfaces with experts and users. A comparative analysis was then conducted to determine how well AI and humanly generated interfaces implemented accessibility options.

Prompts were provided to develop the home screen interface for the food delivery mobile application in the initial step of employing the AI tool. Five distinct prompts were provided following the accessibility requirements. Prompts to design an interface utilizing various accessibility criteria were presented three times (interface 1, 3, 5). Specific prompts indicating the contrast ratio, font, button, and screen requirements were supplied once (interface 2). Interface 4 (the operating system for the iPhone), button, typeface, and color characteristics were included in another query. The accessibility requirements, which include color contrast, hit target size, text on image, font size, line width, and icon with text, were being used by experts to test the interfaces. The interfaces, which were requested to be created following broad guidelines, have not passed the expert testing criteria. Each of these interfaces complies with one or more accessibility requirements. More accessibility features are present in the interfaces created by providing precise prompts for contrast, font, screen, button, and OS elements than in the previous one. None of the five AI-generated interfaces has more than 50% accessibility elements, even though it is a greater percentage than the other group. The user group likewise received identical interfaces to test with. Legible font, white space, single-handed accessibility, and visual hierarchy were all tested during user testing. It is discovered that the five interfaces are not able to provide readable fonts. The interfaces created in response to particular instructions have neutrally conformed to the white spacing option. One interface has no single-handed accessibility, two have neutral accessibility, and two have strong accessibility. Three interfaces have the visual hierarchy either prominently or neutrally present, whereas two interfaces lack it. The outcomes of the user testing demonstrate once more how accessible interfaces may be made by including prompt controls that specifically explain each accessibility choice individually. This demonstrates that when analyzing the various accessibility criteria in interfaces, experts and users arrive at nearly identical conclusions.

The interfaces in the second level were improved by modifying the colors, contrasts, text size, hit size for each clickable element, and white space in addition to using readable fonts. Following the manual enhancement of the interface through the application of all accessibility standards, the Manual Testing (MTS) score was 6 out of 6. The User Testing (UTS) score during the process was 49 out of 56. For AI-generated interfaces, the same figure was in the 20s. At the same time, AI-generated interfaces' accessibility scores ranged from 4.6 to 7, whereas the humanly improved version received a score of 13. This illustrates clearly how designing interfaces can be made more vulnerable by following generic instructions on adopting accessibility requirements, even while they are AI-generated. Thus, it can be concluded that to match the manually produced interface version, a more precise prompt-based system needs to be established in AI models.

VI. Conclusion

The current state of AI tools for creating mobile application user interfaces has been assessed by this study. Overall, this research has shown that there is still room for development in the AI-generated tools' ability to incorporate accessibility requirements in the user interface. The testing procedure used in this study makes it clear. The recommendation made in the research's conclusion is to improve AI models by including explicit prompts for implementing accessibility in user interface design. This will enable interface development to be implemented more widely.

Limitations and Future Scope

The technical details of applying this technique to train or create an AI tool are revealed and outside the purview of the study, even if this study confirms the necessity of developing AI models with accessibility in mind.

This work provides evidence that the current AI algorithms must be enhanced to make them more accommodating to users with a range of needs. Although the focus of this paper is on improving the accessibility of AI-generated interfaces, its scope can be further expanded to implement the findings by altering AI algorithms to take accessibility parameters into account and produce interfaces that are more widely usable. The study was also restricted to the visual design component of accessibility; other components, such as navigation, perceivability, and discoverability, might be examined and improved by adopting and utilizing comparable procedures. The study also considered only one AI tool. In future comparison between tools can be identified for effective output.

References

1. "ICIDH-2: International Classification of Functioning, Disability, and Health: Final Draft, Full Version. Classification, Assessment, Surveys and Terminology Team, World Health Organization." 2001. WHO.
2. Bernard, M., C. H. Liao, and M. Mills. 2001. "The Effects of Font Type and Size on the Legibility and Reading Time of Online Text by Older Adults." In CHI'01 Extended Abstracts on Human Factors in Computing Systems, 175–76. New York, NY: ACM Press.
3. Brinck, T., D. Gergle, and S. D. Wood. 2001. Usability for the Web: Designing Websites That Work. Elsevier.

4. Chapuis, O. 2011. "Impact of Target Size on Pointing Performance in Mobile Environments." In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 3123–32.
5. Coursaris, C. K. 2008. "Web Site Iconography and Culture: A Comparison of Five Countries." *Journal of Information, Information Technology, and Organizations* 3: 1–24.
6. Dey, A. 2011. "The Effects of Website Interface Design on User Performance: A Usability Approach." In *Proceedings of the 44th Annual Hawaii International Conference on System Sciences*, 1–9.
7. Djamasbi, Soussan, Marisa Siegel, and Tom Tullis. 2011. "Visual Hierarchy and Viewing Behavior: An Eye Tracking Study." In *Human-Computer Interaction. Design and Development Approaches*, 331–40. Berlin, Heidelberg: Springer Berlin Heidelberg.
8. Dumas, Joseph S., and Janice C. Redish. 1999. *Practical Guide to Usability Testing*. 2nd ed. Bristol, England: Intellect Books.
9. Faraday, Pete. 2000. "Visually Critiquing Web Pages." In *Eurographics*, 155–66. Vienna: Springer Vienna.
10. Fitts, P. M. 1954. "The Information Capacity of the Human Motor System in Controlling the Amplitude of Movement." *Journal of Experimental Psychology* 47 (6): 381–91.
11. Flanders, V. 2002. *Son of Web Pages That Suck: Learn Good Design by Looking at Bad Design*. SYBEX Inc.
12. Gray, W. D., and M. Salzman. 1998. "Damaged Merchandise? A Review of Experiments That Compare Usability Evaluation Methods." *Compare Usability Evaluation Methods*, *Human-Computer Interaction* 13 (3): 203–61.
13. Gregor, P., A. F. Newell, and M. Zajicek. 2002. "The Experienced Web: Designing a Usability Tool for Older Users." In *Proceedings of the 2002 Conference on Universal Usability*, 85–92.
14. Hill, A. L., and L. Scharff. 1996. *Readability of Websites with Various Foreground/Background Color Combinations, Font Types, and Word Styles*.
15. Hsu, C. L. 2014. "The Effects of Realistic Icons and Human Voice on Smartphone Interfaces for Elderly Users." *Behavior & Information Technology* 33 (7): 674–85.
16. Ivory, M. Y., and M. A. Hearst. 2002. "Improving Website Design." *IEEE Internet Computing* 6 (2): 56–63.
17. Johnson, Jeff. 2000. *GUI Bloopers: Don'ts and Do's for Software Developers and Web Designers*. Oxford, England: Morgan Kaufmann.
18. Kim, H., and J. Moon. 2018. "The Influence of Whitespace on Visual Attention and Persuasion: An Eye-Tracking Study." *International Journal of Human-Computer Interaction* 34 (9): 822–33.
19. Kurniawan, Sri, and Panayiotis Zaphiris. 2005. "Research-Derived Web Design Guidelines for Older People." In *Proceedings of the 7th International ACM SIGACCESS Conference on Computers and Accessibility*. New York, NY, USA: ACM.
20. Landa, R. 2014. *White space is not your enemy: A beginner's guide to communicating visually through graphic, web, and multimedia design*. CRC Press
21. Martins, Beatriz, and Carlos Duarte. 2024. "Large-Scale Study of Web Accessibility Metrics." *Universal Access in the Information Society* 23 (1): 411–34. <https://doi.org/10.1007/s10209-022-00956-x>.
22. Murray, Costanzo. 1999. "Usability and the Web: An Overview." *Network Notes* 61.
23. Nielsen, J. 1994. "Heuristic Evaluation." In *Usability Inspection Methods*, edited by J. Nielsen and R. L. Mack. New York, NY: John Wiley & Sons.
24. Nielsen, J. 2010. *White Space in User Interface Design*.
25. Petrie, Helen, Andreas Savva, and Christopher Power. 2015. "Towards a Unified Definition of Web Accessibility." In *Proceedings of the 12th International Web for All Conference*. New York, NY, USA: ACM.
26. Reber, Rolf, Norbert Schwarz, and Piotr Winkielman. 2004. "Processing Fluency and Aesthetic Pleasure: Is Beauty in the Perceiver's Processing Experience?" *Personality and Social Psychology Review: An Official Journal of the Society for Personality and Social Psychology, Inc* 8 (4): 364–82. https://doi.org/10.1207/s15327957pspr0804_3.
27. Rubin, J., and D. Chisnell. 2008. *The Handbook of Usability Testing*. Indianapolis, IN: Wiley Publishing, Inc.
28. Shipley, A. 2002. "Creating an Inclusive Environment." *Disability Rights Commission*. 2002. <http://www.designingaccessiblecommunities.org/policies/CreatingInclusiveEnvironment.pdf>.
29. Still, Jeremiah D. 2018. "Web Page Visual Hierarchy: Examining Faraday's Guidelines for Entry Points." *Computers in Human Behavior* 84: 352–59. <https://doi.org/10.1016/j.chb.2018.03.014>.
30. Tahir, M. H. 2018. "Icon Design for Use on Websites: The Impact of Visual Distinctiveness on Human-Computer Interaction." *Computers in Human Behavior* 82: 72–83.
31. Tullis, Thomas, and William Albert. 2010. *Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics*. Morgan Kaufmann.
32. Wobbrock, Jacob O., Kristen Shinohara, and Alex Jansen. 2011. "The Effects of Task Dimensionality, Endpoint Deviation, Throughput Calculation, and Experiment Design on Pointing Measures and Models." In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. New York, NY, USA: ACM.