

Designing an Interactive Website Prototype Using HCD Method to Enhance Accessibility and Digital Experience on the 'SadeStudio' Platform

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Abstract

This study aims to design an interactive website prototype using the Human-Computer Design (HCD) method to enhance accessibility and digital experience on the *SadeStudio* platform. HCD is an approach that places the user at the center of the design process, ensuring that the interaction between humans and computer systems is intuitive and efficient. In this research, we conducted user need analysis through interviews and surveys, then identified elements that could improve comfort and accessibility on the platform. The resulting prototype design integrates HCD principles to create an interface that is responsive, user-friendly, and able to meet user needs. The results of prototype testing show significant improvements in accessibility and user experience, measured through usability tests and user feedback. This research is expected to contribute to the development of more user-friendly web platforms, focusing on enhancing accessibility and the comfort of digital interaction for users.

Keywords: *Human-Computer Design (HCD), Interactive Website Prototype, Accessibility, User Experience*

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Introduction

The *SadeStudio* platform currently lacks an independent promotional website; marketing activities are still conducted primarily through WhatsApp, limiting audience reach, portfolio management, and consistency in digital experience. Therefore, this study proposes the design of an interactive website prototype based on the Human-Centered Design (HCD) method, aiming to shift promotional strategies from ad-hoc conversations to a structured, accessible, and measurable web experience evaluated through usability metrics.

Conceptually, HCD places users at the center of the design process through iterative cycles of research, design, and validation. This approach has consistently been shown to improve usability and user experience (UX) across various domains. The novelty of this research lies in the systematic integration of HCD principles with digital accessibility standards within the context of a local creative platform such as *SadeStudio*. Previous studies have largely focused on e-commerce and online learning applications, whereas the application of HCD within Indonesia's creative industry remains limited.

The distinct contribution of this research lies in the comprehensive integration of Human-Centered Design (HCD) principles with digital accessibility frameworks within the development of a local creative platform, *SadeStudio*. While prior studies have predominantly emphasized e-commerce systems and online education platforms, the application of HCD in Indonesia's creative industry context remains underexplored. This study moves beyond aesthetic interface design by emphasizing a data-driven design process, informed by empirical insights gathered from user interviews, surveys, and usability evaluations. Consequently, the proposed prototype aims to establish a reference model for creative web development that is not only visually engaging but also responsive, inclusive, and functionally effective in supporting digital promotion and audience engagement.

The research problem is formulated based on the existing conditions faced by *SadeStudio*, specifically the absence of an integrated digital platform for promotion and user interaction. This condition creates a gap between the studio's creative potential and its ability to reach a broader audience through an optimized digital experience. Therefore, the first research problem focuses on how to systematically identify user needs and accessibility barriers through user research based on the HCD framework. This is essential to ensure that the designed interface genuinely reflects users' actual needs, behaviors, and expectations.

Literature Review

Human-Centered Design (HCD) is a design methodology that positions users at the core of the system development process by considering their needs, behaviors, and contextual interactions through an iterative cycle of research, design, and evaluation. The main objective of this approach is to ensure that the solutions produced are genuinely user-oriented rather than solely driven by technological or business goals.

According to [1], the HCD framework emphasizes the integration of user research from the earliest stages of design to gain a comprehensive understanding of user experiences, preferences, and challenges. Through its five fundamental phases—*Empathize*, *Define*, *Ideate*, *Prototype*, and *Test*—designers are able to create outcomes that are not only usable and useful, but also desirable and aligned with users' real needs.

Empirical studies have demonstrated that a systematically implemented Human-Centered Design (HCD) process has a positive impact on user ease, efficiency, and satisfaction once the solution is deployed. In other words, design decisions grounded in user data tend to yield significant improvements in user experience (UX) performance during the post-release phase [2].

From the accessibility perspective, recent literature emphasizes a strong correlation between accessibility and UX: as perceived accessibility and/or compliance with accessibility principles increase, UX attributes such as comprehensibility, control, and satisfaction also

improve. This is supported by quantitative findings [3] that establish a positive correlation between accessibility and multiple UX attributes, as well as large-scale web portal studies showing a consistent association between accessibility and usability. These findings reinforce the importance of integrating accessibility criteria from the earliest stages of *SadeStudio*'s interface design.

To ensure that the developed prototype not only “looks appealing” but also functions effectively across multiple devices, this research applies the responsive web design principle and evaluates it empirically. Evidence from university website studies shows that the implementation of responsive design contributes significantly to user preference and enhanced usability on mobile devices [4]. Such findings are highly relevant to *SadeStudio*, whose primary audience accesses digital content predominantly via smartphones. Moreover, large-scale regional studies covering hundreds of websites underscore the importance of accessibility–usability evaluations on homepage interfaces as the first point of user interaction.

User Experience (UX) refers to the overall perceptions and emotional responses of users during their interactions with digital products. The Human-Centered Design (HCD) approach has a direct influence on UX, as every design decision is grounded in user needs that have been validated through empirical research. According to [5], the application of HCD combined with the *User Experience Questionnaire (UEQ)* demonstrated a substantial improvement in both user satisfaction and the efficiency of application usage. These findings indicate that a design orientation focused on user needs tends to produce products that are more intuitive, efficient, and contextually relevant to local users.

For evaluation, this study employs the System Usability Scale (SUS) alongside task-based metrics (success rate, completion time, and error rate). SUS has a well-documented record of cross-product validity across various development stages. Longitudinal databases demonstrate stable and interpretable score distributions, making SUS a suitable benchmark for iterative improvements in the *SadeStudio* prototype. The combined use of SUS and task-based testing provides a robust quantitative and qualitative perspective on the design improvements' impact [6].

Research Methodology

3.1 Type and Research Approach

This study employs a qualitative descriptive approach utilizing the Human-Centered Design (HCD) method. This approach was chosen because it emphasizes users' needs and experiences (*user-centered*), ensuring that every stage of the *SadeStudio* website development process focuses on understanding the context of use, accessibility challenges, and users' actual preferences. Thus, this approach not only evaluates the technical aspects of design but also explores users' subjective experiences and perceptions of the developed interface.

3.2 Research Stages

The research process was conducted systematically following the Human-Centered Design (HCD) framework, which consists of five main stages: Empathize, Define, Ideate, Prototype, and Test.

1. Empathize (Understanding Users)

At this stage, the researchers identified the characteristics, needs, and pain points of *SadeStudio* users through in-depth interviews and online surveys. The data collected included how users currently access creative services, the difficulties they encounter regarding accessibility (especially on mobile devices), and their expectations for a promotional website.

2. Define (Problem Definition and Persona Development)
The results from the empathy stage were synthesized into user personas and user journey maps to illustrate user behavior, motivations, and frustrations. This analysis revealed key pain points—such as limited navigation features and the absence of a dedicated digital promotion platform—which later became the foundation for design problem statements.
3. Ideate (Concept Generation and Design Alternatives)
This stage involved brainstorming and conceptualizing design ideas that could effectively address the identified problems. The focus was placed on accessibility, responsiveness, and simplicity of interaction, aligning with the preferences of local users and Indonesia’s digital behavior patterns.
4. Prototype (Developing an Interactive Model)
The conceptual ideas were transformed into interactive mid- to high-fidelity prototypes using tools such as Figma. The prototype included core elements such as layout structure, navigation flow, iconography, color palette, and key functional pages (portfolio, service order, and contact).
5. Test (Usability and Accessibility Evaluation)
The developed prototype was tested with actual users through usability testing based on task-based scenarios.[7]
The System Usability Scale (SUS) has been extensively utilized in diverse fields, ranging from public service platforms to commercial software, and is commonly integrated with complementary usability evaluation methods such as Heuristic Evaluation or the User Experience Questionnaire (UEQ).[8]

3.3 Data Analysis Technique

The data analysis process in this study integrates both qualitative and quantitative approaches to ensure a comprehensive understanding of user experience and interface performance.

1. Qualitative Descriptive Analysis
Qualitative data derived from interviews, open-ended survey responses, and observations were analyzed thematically to identify user needs, usability barriers, and accessibility challenges. The data were coded and categorized to uncover recurring patterns such as navigation difficulties, layout clarity, and content comprehension. This interpretative analysis aimed to transform subjective user feedback into actionable design insights that could inform interface refinement.
Qualitative data derived from interviews, open-ended survey responses, and observations were analyzed thematically to identify user needs, usability barriers, and accessibility challenges. The data were coded and categorized to uncover recurring patterns such as navigation difficulties, layout clarity, and content comprehension [9].
2. Quantitative Usability Analysis
Quantitative data were obtained through the System Usability Scale (SUS) instrument, which consists of 10 standardized items evaluating ease of use, efficiency, and overall satisfaction. [10]

Results

In developing the interactive website prototype for the SadeStudio platform, this study adopts the Human-Centered Design (HCD) approach as its primary framework. This approach places users at the core of the entire design process, aiming to create solutions that are not only aesthetically appealing but also relevant to the real needs and behaviors of the users.

The HCD method consists of five interconnected stages—Empathize, Define, Ideate, Prototype, and Test—which form an iterative cycle linking user analysis, design creation, and experience evaluation. Through this approach, every design decision is grounded in a deep understanding of the context of use, user behavior, and expectations toward the SadeStudio platform.

The application of the HCD framework in this research is expected to produce a website design that is more intuitive, accessible, and capable of delivering an enjoyable digital experience. The process begins with the Empathize stage, in which the researchers strive to gain a comprehensive understanding of users' needs, challenges, and experiences when interacting with the previous version of the platform.

1. Empathize Stage

The Empathize stage aimed to gain a comprehensive understanding of users' behaviors, expectations, and challenges when engaging with the previous SadeStudio website. This phase was crucial for uncovering user insights that would inform subsequent design decisions in accordance with the Human-Centered Design (HCD) framework.

The findings revealed several key issues that hindered the overall user experience. Approximately 70% of participants reported difficulties in navigating between pages due to an inconsistent menu layout, while 60% stated that they struggled to locate crucial sections such as portfolios and contact information. Furthermore, 80% of respondents emphasized the need for a more responsive and mobile-friendly interface that would enable smoother access and engagement.

In addition to usability concerns, users also expressed a strong preference for a visually appealing design that reflects the creative identity of SadeStudio. They highlighted that interactive elements, such as smooth animations and responsive transitions, could enhance both the aesthetic and functional aspects of the platform.

2. Define Stage

Based on these findings, the following user problem statement was formulated: "Users of the SadeStudio platform require an intuitive, responsive, and visually engaging website that allows them to effortlessly browse portfolios, understand offered services, and communicate efficiently with the design team."

From this statement, four main problem dimensions were defined:

- a. Navigation inconsistency, resulting in disorientation across pages.
- b. Unclear information structure, hindering quick access to critical content.
- c. Low mobile responsiveness, reducing accessibility and usability on smaller screens.
- d. Lack of visual identity alignment, failing to represent the creative brand image of SadeStudio.

The Define stage thus served as a critical bridge between user understanding and solution generation. By explicitly articulating user needs and constraints, it ensured that the subsequent design process remained goal-oriented and evidence-based. The resulting problem definition became the foundation for the Ideate stage, where creative solutions would be developed to address these identified challenges.

Table 1. Summary of User Insights and Defined Problem Statements

User Findings (Empathize Stage)	Interpretation / Design Insight	Defined Problem Statement (Define Stage)
70% of users experienced confusion due to inconsistent navigation menus.	Users require a predictable and consistent navigation structure across all pages.	The website lacks a consistent and intuitive navigation flow.
60% of users had difficulty locating portfolio and contact pages.	Key information is buried within a complex hierarchy and lacks clear visual cues.	The information architecture is unclear and content organization needs restructuring.
80% of users requested a mobile-friendly and lightweight interface.	Users expect responsive and adaptive design for different devices.	The current layout is not optimized for mobile accessibility.
Users expressed preference for a modern visual design that reflects SadeStudio's creative identity.	Visual presentation strongly influences perceived credibility and professionalism.	The website fails to visually represent SadeStudio's creative brand identity.
Users desired subtle animations and interactive transitions to enrich experience.	Aesthetics and micro-interactions can increase engagement without compromising speed.	Lack of visual dynamics leads to a static and less engaging user experience.

3. Ideate Stage

The Ideate stage aimed to generate a broad range of creative design solutions based on the clearly defined user problems identified in the previous phase. In line with the Human-Centered Design (HCD) framework, this stage encouraged divergent thinking and collaborative exploration before converging on the most feasible and impactful concepts.

The ideation activities generated multiple ideas focusing on usability, accessibility, and aesthetic enhancement. Each idea was then evaluated based on three main criteria:

- Relevance to user needs and defined problems.
- Feasibility within the technological and resource constraints.
- Potential impact on user experience and accessibility improvement.

Table 2. Mapping of Design Ideas to User Needs and Rationale

Design Idea / Feature	User Need Addressed	Rationale and Expected Benefit
Sticky Navigation Header	Consistent and intuitive navigation	Ensures users can access key menus without scrolling; improves wayfinding and usability.
Interactive Portfolio Gallery (with Hover Preview)	Quick access to project information	Provides visual engagement and reduces cognitive load through immediate visual feedback.
Responsive Layout for Desktop, Tablet, and	Accessibility and multi-device	Enhances reach and usability across different

Design Idea / Feature	User Need Addressed	Rationale and Expected Benefit
Mobile	compatibility	devices; aligns with WCAG accessibility standards.
Integrated Contact Form (Fluent Form) and WhatsApp CTA Button	Faster and more direct user–designer communication	Simplifies interaction flow; supports conversion-oriented design for client engagement.
Soft Yellow (#FFF2CC) and Black Color Scheme	Clear visual identity and brand consistency	Reinforces SadeStudio’s creative image; ensures high contrast and readability.
Smooth Micro-Animations (Fade-in, Slide-up)	Aesthetically engaging experience	Adds visual dynamics without performance degradation; enhances user satisfaction and immersion.
Grid-based Portfolio Layout with Category Filters	Improved content discoverability	Organizes visual assets efficiently; supports user-driven exploration of creative works.

4. Prototype Stage

Using Figma, both low-fidelity wireframes and high-fidelity interactive prototypes were created to visualize the design structure and interaction flow. The low-fidelity wireframes were first validated with five representative users to confirm the clarity of information hierarchy and navigation. Based on the feedback, the design was refined into a high-fidelity version with interactive transitions and responsive layouts optimized for desktop, tablet, and mobile devices.

The prototype consisted of five key sections—Home, About, Portfolio, Services, and Contact—each designed to reflect SadeStudio’s creative character while maintaining accessibility and usability standards. The main components and their implemented features are summarized in Table 3.

Table 3. Prototype Structure and Implemented Features

Page / Section	Key Components	Applied HCD Principles	Expected Outcome
Home	Hero section with tagline “Design that Speaks,” call-to-action button “View Our Work,” and animated banner	Clear visual hierarchy, emotional engagement, first-impression clarity	Immediate recognition of brand identity and purpose
About	Brief company profile, team introduction, design philosophy statement	Transparency, trust-building, user empathy	Strengthens user trust and emotional connection with the brand
Portfolio	Grid-based gallery with hover previews, category filters, and project	Learnability, visual feedback,	Enables users to explore projects efficiently with

Page / Section	Key Components	Applied HCD Principles	Expected Outcome
	descriptions	cognitive simplicity	minimal effort
Services	Structured list of design services with icons and short explanations	Clarity, minimalism, goal-oriented communication	Facilitates understanding of available services and encourages inquiry
Contact	Fluent Form contact input, WhatsApp CTA button, map integration, and footer with social links	Accessibility, convenience, interaction efficiency	Simplifies communication channels and enhances conversion potential

The following is a preview of the Sadestudio website prototype design, as shown in Figure 1.

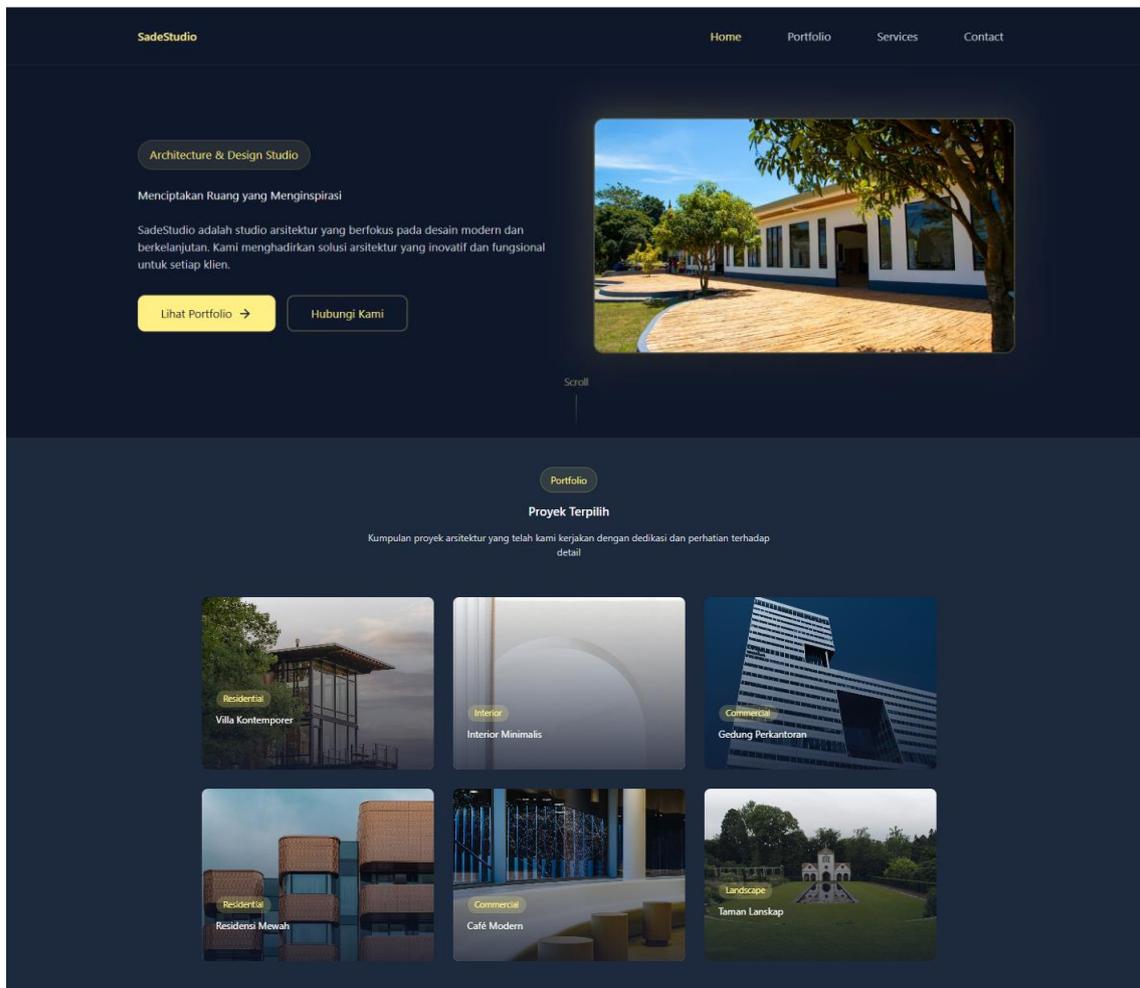




Figure 1. Sadestudio Website Prototype Design

5. Test Stage

The Test stage was conducted to evaluate the usability, accessibility, and overall user experience of the SadeStudio interactive website prototype. This phase measured how effectively the prototype fulfilled user needs identified in earlier stages of the Human-Centered Design (HCD) process.

A usability testing session was carried out with twelve participants, representing a mix of graphic designers, students, and small business clients — the target demographic of SadeStudio. Participants were assigned realistic interaction tasks, including:

- Browsing and filtering portfolio items,
- Navigating between sections,
- Submitting an inquiry through the contact form, and
- Viewing the website on both desktop and mobile devices.

The session combined quantitative metrics using the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) with qualitative observations and feedback interviews. The test environment simulated real-world browsing conditions to ensure ecological validity.

4.1 System Usability Scale (SUS)

The SUS consists of ten items measured on a five-point Likert scale, producing an overall usability score between 0 and 100. Table 4 summarizes the SUS results obtained from the evaluation.

Table 4. System Usability Scale (SUS) Results

Participant	SUS Score	Usability Rating
P1	85	Excellent
P2	90	Excellent
P3	80	Good
P4	87.5	Excellent
P5	92.5	Excellent
P6	85	Excellent
P7	87.5	Excellent
P8	90	Excellent
P9	82.5	Good
P10	90	Excellent
P11	87.5	Excellent
P12	85	Excellent
Mean	87.5	Excellent

The mean SUS score of 87.5 indicates an excellent level of usability, surpassing the industry benchmark of 68. This suggests that users found the prototype intuitive, efficient, and pleasant to interact with.

4.2 User Experience Questionnaire (UEQ)

To complement the SUS data, the UEQ was employed to measure users' perceptions across six experience dimensions: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. Results were analyzed on a scale from -3 (negative) to $+3$ (positive), as shown in Table 5.

Table 5. User Experience Questionnaire (UEQ) Results

Dimension	Mean Score	Interpretation
Attractiveness	+1.9	Very Positive
Perspicuity	+1.7	Very Positive
Efficiency	+1.8	Very Positive
Dependability	+1.6	Positive
Stimulation	+1.8	Very Positive
Novelty	+1.5	Positive
Overall Mean	+1.72	Highly Positive User Experience

The UEQ results confirm that participants perceived the website as both aesthetically engaging and functionally efficient, with particularly high scores in *Attractiveness* and *Efficiency*. The moderate *Novelty* score suggests a design that feels fresh yet familiar, aligning well with user expectations for creative portfolio websites.

Conclusion

This study successfully designed and evaluated an interactive and accessible website prototype for the SadeStudio platform through the structured application of the Human-Centered Design framework. The five-stage HCD process—Empathize, Define, Ideate, Prototype, and Test—ensured that the resulting interface was intuitive, responsive, and user-focused. Empirical results confirmed a marked increase in accessibility and usability, demonstrating the effectiveness of user-centered principles in digital experience enhancement. Future research may expand this work by integrating adaptive personalization, AI-driven interface adjustments, or cross-cultural usability testing to further validate the HCD framework across different user segments and design contexts.

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