Rethinking User Interfaces in the Age of Artificial Intelligence

Ghada Refaat El Said
Professor of Management Information Systems
Department of Management Information Systems
Future University in Egypt (FUE), Egypt

Keywords
AI-enhanced user interfaces; User perception of AI; Human-AI collaboration

Abstract

As artificial intelligence (AI) continues to transform user interface (UI) design, understanding user perceptions and expectations of AI-powered interactions becomes increasingly important. This study uses thematic analysis of focus group discussions to investigate important themes around AI-enhanced user interfaces. The findings highlight six underlying themes: (1) user perception of AI, where familiarity with AI systems influences confidence and adoption; (2) transparency and explainability, highlighting users' demand for clarity in AI decision-making processes; (3) collaboration versus automation, emphasizing user preference for AI as an augmentative tool rather than a fully autonomous system; (4) inclusivity and accessibility, underscoring the need for adaptable, bias-conscious AI interfaces; (5) evolving interaction paradigms, showcasing users' shifting expectations of AI as a co-evolving assistant rather than a static tool; and (6) ethical and emotional considerations, revealing concerns over privacy, data security, and emotional attachment to AI systems. These findings inform future UI designs, advocating for customizable, transparent, and ethically responsible AI-driven interfaces that foster user trust and engagement.

Introduction

The use of artificial intelligence (AI) into user interface (UI) design is quickly changing how people interact with digital systems. AI-enhanced interfaces are progressively being integrated into everyday life, from voice assistants and recommendation engines to adaptive learning platforms and smart home gadgets. These technologies promise more efficiency, customization, and responsiveness, but they also introduce new challenges in how people perceive, trust, and interact with technology (Hering et al., 2025). This concern is particularly acute in high-stakes domains such as healthcare, finance, and public services, where opaque AI decisions can have significant consequences. Studies have shown that explainable AI (XAI) features, such as visual indicators, justifications, and feedback loops, can enhance user trust and satisfaction (Xie et al., 2023).

Another important consideration is the nature of human-AI collaboration. Rather than seeing AI as a substitute for human decision-making, many users prefer systems that function as intelligent assistants, supplementing rather than replacing human agency. Users perceive AI systems more positively when they engage in two-way communication, suggesting that co-creative and collaborative interaction models foster greater engagement and trust (Rezwana et al., 2022). This aligns with broader trends in HCI that advocate for participatory and user-guided AI design.

Simultaneously, ethical questions have become crucial to the debate over AI design, where ethical AI needs to be developed through interdisciplinary collaboration and built on concepts of fairness, accountability, and transparency. Ethical AI design must consider not only computational logic, but also the larger social and cultural settings within which AI operates. The *Ethics by Design* framework (Bayramoğlu, 2025) suggests incorporating ethical ideas into the design and development of AI systems, rather than treating them as an afterthought. Furthermore, emphasizes the necessity of ethics education and international cooperation in guaranteeing responsible AI deployment, particularly in sensitive sectors such as education and public services.

Despite these developments, we still don't fully understand how different consumers interpret and respond to AI-enhanced interfaces. Much of the existing research focuses on technical performance or isolated UX metrics, with less attention paid to the holistic, lived experiences of users interacting with AI in

real-world contexts. Moreover, issues of inclusivity, accessibility, and ethical design are often underexplored, particularly in relation to marginalized or underrepresented user groups.

This study addresses these gaps by conducting a thematic analysis of focus group discussions centred on user perceptions of AI-enhanced UIs. By capturing a wide range of user voices and experiences, the research aims to contribute to a more nuanced understanding of user expectations and inform the design of future AI-driven interfaces that are not only functional but also transparent, inclusive, and ethically responsible.

Background and Motivation

The incorporation of artificial intelligence (AI) into user interface (UI) design has sparked a new wave of interdisciplinary research into how consumers perceive, interact with, and assess AI-enhanced systems. User perception is a critical problem since it influences trust, adoption, and long-term involvement. Krägeloh et al. (2025) developed the Artificial Intelligence Attitudes Inventory (AIAI), which distinguishes between positive and negative attitudes about AI, indicating that these are not diametrically opposed but rather unique psychological constructs that influence user behavior in subtle ways. Similarly, Li et al. (2024) found that UX professionals perceive generative AI as both empowering and threatening, depending on their experience level and perceived agency, highlighting the emotional and cognitive tensions users face when engaging with AI systems.

Transparency and explainability have emerged as key elements in this discussion. According to Polignano et al. (2024), explainability must be combined with responsibility to be significant, particularly in high-stakes areas like healthcare and finance. Cheong (2024) further emphasizes that transparency is not merely a technical challenge but a legal and ethical imperative, requiring interdisciplinary governance frameworks to ensure AI systems safeguard individual and societal well-being. In educational contexts, Xie et al. (2023) demonstrate that explainable AI (XAI) features enhance trust and ethical integrity, particularly when users can query or challenge AI decisions. Beyond transparency, the nature of human-AI collaboration is evolving. Rezwana et al. (2022) found that users prefer co-creative interaction models where AI acts as an augmentative partner rather than a fully autonomous agent, fostering greater engagement and trust. This aligns with broader HCI trends advocating for participatory and user-guided AI design.

However, diversity and accessibility are still underexplored. While algorithmic fairness has received attention, interface-level inclusivity, such as adaptable UI elements for users with disabilities or varying levels of digital literacy, has not been sufficiently addressed. The Krägeloh et al. (2025) study also underscores the importance of demographic sensitivity, showing that attitudes toward AI vary significantly across age, education, and cultural background. As AI systems become more adaptive and context-aware, interaction paradigms are shifting from static command-response models to dynamic, co-evolving relationships. Spallazzo et al. (2025) introduced a framework to evaluate user experience in AI-infused systems, emphasizing the need for new metrics that capture the fluid, learning-based nature of these interactions.

On the other hand, ethical and emotional components are increasingly seen as essential to AI design. Bayramoğlu (2025) argues for *Ethics by Design* method, incorporating ethical concepts into AI system development to promote justice, transparency, and user empowerment. Li et al. (2024) also express concern about skill degradation, job displacement, and emotional tiredness among junior designers, emphasizing the importance of emotionally aware AI systems that promote rather than hinder human creativity. This literature highlights the numerous problems and potential in creating AI-enhanced UIs that are not only intelligent and efficient, but also transparent, inclusive, and ethically sound.

Methodology

This study takes a qualitative research approach, utilizing focus group sessions to investigate user perceptions and expectations of AI-driven interactions in user interface (UI) design. Thematic analysis was used to discover reoccurring themes in participant responses, resulting in a more structured and insightful data investigation.

A purposive sampling strategy was used to recruit participants with diverse backgrounds in technology use and AI familiarity. Purposive sampling, a non-random sampling technique, is used; where

participants are intentionally selected based on specific characteristics or criteria that align with the study's objectives. A total of **12** participants were selected, ensuring representation across various user demographics, including age, profession, and AI experience. Participants were screened to ensure varying levels of exposure to AI-driven interfaces, allowing for a nuanced understanding of user perspectives. **Table1** illustrates the sample demographic characteristics.

Table1: Focus Group Participants' Characteristics

Category	Category	Count	Percent
Gender Distribution	Male	7	58%
	Female	5	42%
Age Group	18-26	2	20%
	27-35	3	25%
	36-44	3	25%
	45-60	4	30%
Educational Background	Undergraduate 2	20%	
	Graduates 10	80%	
Professional Background	MIS Student*	2	20%
	UI/UX Designer**	4	30%
	Software Engineer	3	25%
	General User	3	25%
Technological Familiarity	Frequent AI User	6	50%
	Occasional User	3	25%
	Limited Exposure	3	25%

*MIS: Management Information Systems

**UI/UX: User Interface/ User Experience

Two focus group sessions were conducted online on Zoom, each lasting approximately **90** minutes, and each included **6** participants. Session were moderated by the researcher, a trained facilitator who guided discussions using semi-structured interview protocols. Questions were designed to prompt participants to reflect on their experiences, concerns, and expectations regarding AI-enhanced UI interaction. Discussions were recorded and transcribed for accuracy.

Since the goal was to explore themes rather than impose preconceived categories, the questions were designed to be open-ended and neutral, allowing participants to naturally reveal their thoughts without being guided toward specific themes, these questions were as follows:

1. "*Can you share any experiences you've had with AI-driven interfaces? What stood out to you whether positive or challenging?*"
2. "*How do you generally feel when interacting with AI in digital spaces? What influences those feelings?*"
3. "*What do you expect from AI-enhanced interfaces? Have your expectations changed over time?*"
4. "*If AI could evolve better align with users' needs, what would you want to change or improve?*"
5. "*Are there any concerns or thoughts you've had about AI in interfaces that you think deserve more attention?*"

Thematic Analysis

A thematic analysis approach was employed, following Braun & Clarke's (2006) six-step framework: Familiarization in the data; Generating Initial Codes; Searching for Themes; Reviewing Themes; Defining and Naming Themes; and Reporting Findings. This process was conducted through the following systematic steps:

- Each focus group session was transcribed verbatim
- The researcher went through transcripts carefully, identifying recurring statements, descriptions, and opinions expressed by users.
- Relevant portions of the text were labeled with specific codes that capture the essence of participant remarks. These labels function as data tags, categorizing statements that reflect user sentiment, concerns, or expectations toward AI-enhanced UIs.
- Codes are analyzed for similarities and overlaps. Codes are consolidated into broader themes that represent patterns across discussions. For example:

- Statements describing hesitation in trusting AI recommendations may be grouped under the broader theme of "Trust in AI."
- Conversations about the ability to control AI system behavior might be categorized under "User Adaptability."
- Comments related to AI assisting rather than replacing users can contribute to the theme "Collaboration Preferences."

Results

Based on thematic analysis of the focus group discussions, the following themes were explored. Quotations from the focus groups are marked in italic.

User Perception of AI-Enhanced UIs

This theme is particularly important because user expectations and comfort levels vary based on prior experience with AI-driven technologies. Participants familiar with AI-powered systems, such as smart assistants, recommendation algorithms, and automated workflows, expressed greater confidence in the ability of AI to enhance their interaction with digital systems. Conversely, users who have little experience or negative past interactions with AI expresses "*skepticism, particularly concerning AI transparency and decision-making logic*".

Majority of participants articulate a desire for greater **control over AI** features in interfaces, preferring designs that allow for *adjustable levels of automation rather than systems that automatically assume user intent without explicit input*. Significant discussion was conducted around the balance between user agencies and AI-driven automation, whether AI should act as a background assistant that learns passively or as an interactive entity that adapts dynamically based on direct user guidance. Few participants expressed that they feel "*overwhelmed by fully autonomous systems, preferring a hybrid approach where AI suggests options rather than executing tasks without human verification*".

An interesting counterpoint to this finding comes from the study of Müller and Maier (2024), suggesting that when users were given less control over AI functions, they performed worse in decision-making tasks compared to those who had more control. This study suggests that while many users may *say* they want more control, limiting user intervention might lead to better outcomes in certain contexts, particularly when the AI is demonstrably competent.

Transparency and Explainability

Participants highlighted their discomfort with AI systems that function as *black boxes* producing decisions or recommendations without providing **clear reasoning or explanations**. Participants reached consensus that this concern is particularly relevant in industries such as healthcare, finance, and security, where AI-driven automation has significant implications. All participants expressed the need for *explainable AI (XAI)* features, such as visual indicators that clarify how and why an AI system arrived at a particular recommendation.

A discussion was raised around threshold for acceptable **AI transparency**, how much explanation is enough before an interface becomes overly complex? Half of users expressed preference "*streamlined interactions with minimal AI interruptions*", while others advocate for "*in-depth reasoning behind each decision, particularly in high-stakes scenarios*". A potential insight from the thematic analysis is that users appreciate *progressive disclosure*, where AI explanations are optional and available when needed rather than intrusive and constant. Users also discussed trust-building mechanisms, such as AI interfaces incorporating feedback loops, where users can query or correct AI decisions, thus fostering a more interactive relationship. This finding supports the recommendation of Muralidhar at al. (2024) study which highlighted that users value diverse explanation methods and that feedback mechanisms, such as the ability to query or adjust AI outputs, enhance trust and engagement.

Collaboration vs. Automation

During focus group, a debate between AI automation and **human-AI collaboration** was raised. A key finding from the analysis suggested that collaboration-based AI features, such as real-time adaptability, predictive assistance, and user-guided AI behavior adjustments, are significantly more desirable than

purely automated systems. Participants of the focus groups articulate a vision for AI-driven interfaces "*where suggestions feel like teamwork rather than instruction-based automation*".

Many users express a strong preference for AI systems that provide an assistant rather than replacing human decision-making entirely. This perspective aligns with the argument in the academic paper that AI should augment human agency rather than supplant it (Rezwana et al., 2022). Participants in the focus groups emphasize the importance of "*customizable AI interactions, allowing individuals to dictate whether AI is playing a suggestive, interactive, or autonomous role within the interface*". Additionally, participants working as designers raised the concern that excessive automation over-personalizes or preempts user intent, potentially reducing user engagement with their own processes.

Inclusivity & Accessibility

Given the diversity of participants in the focus groups, another theme raised the need for inclusive AI-enhanced UI design. The discussion revealed varied preferences and accessibility needs across different user groups. Participants who are highly tech-literate expressed excitement about advanced AI-enhanced interfaces with customizable workflows and automation. Conversely, users who are less comfortable with complex technology requested "*intuitive, simplified designs that enable easy onboarding and gradual learning*". This thematic finding supports the argument that next-generation AI interfaces must prioritize inclusivity and adaptable UI for users with varying needs and abilities (Zytko et al., 2022).

One of the most critical discussions may center around **bias in AI systems**. Some participants could highlight concerns that AI-based interfaces do not adequately represent diverse user experiences, particularly for individuals from underrepresented communities or those with disabilities. Algorithmic bias is expected to be an issue raised by participants, who may call for more equitable AI training datasets to ensure AI systems do not inadvertently disadvantage specific user groups.

Evolving Interaction Paradigms

AI-enhanced systems allow for dynamic learning, where AI continuously adjusts interactions based on user behavior and feedback. This raises fundamental questions about what users truly want from AI-powered interfaces. Participants in the focus groups expressed enthusiasm for systems that function as **interactive assistants**, rather than passive tools. There may be considerable discussion around trust-building mechanisms within interfaces, where AI progressively learns user preferences while allowing course correction. Some participants described an ideal AI interaction model as a "*co-evolving relationship*," where the UI and adapt to one another over time. Other participants showed preference for conversational AI interfaces, where AI respond in natural language, ask clarifying questions, and adjust its suggestions in real time.

Ethical & Emotional Considerations

The final theme revolves around ethical concerns and emotional responses to AI-enhanced interfaces. Some participants demonstrated **emotional attachment to AI-driven systems**, particularly when they interact with personal AI assistants, chatbots, or adaptive UIs regularly. Participants described scenarios where AI interfaces become an integral part of their workflow, enhancing productivity or even offering emotional comfort in cases where AI functions as a social support system.

A strong viewpoint was raised regarding **privacy and data transparency**, with participants discussing *apprehension about AI-driven decision-making* and **data usage policies**. Some participants questioned whether AI-enhanced UIs are secure and ethically designed, particularly regarding personal data protection and the *risk of AI-driven manipulation.* An important insight from the thematic analysis was that users seek *more control over AI data collection practices*, preferring systems that provide clear options for *data opt-in, selective personalization, and user-managed transparency settings*.

Conclusion

This study explored user perceptions and expectations surrounding AI-enhanced user interfaces through a thematic analysis of focus group discussions. The findings reveal a nuanced landscape of attitudes shaped by prior experience, trust, and individual needs. Participants emphasized clear preference

for interfaces that allow adjustable levels of automation rather than fully autonomous systems. This highlights a growing demand for hybrid interaction models where AI acts as a supportive collaborator rather than a directive force.

The tension between automation and collaboration further underscores the need for customizable AI roles within interfaces. Participants favored systems that adapt to user input and context, reinforcing the argument that AI should augment rather than replace human decision-making. This aligns with broader ethical considerations, as users expressed a desire for inclusive, accessible, and equitable AI systems that respect diverse needs and mitigate algorithmic bias.

A recurring concern across themes was the transparency and explainability of AI systems. Participants consistently voiced discomfort with opaque decision-making processes, particularly in high-stakes domains. The preference for progressive disclosure, where explanations are available but not intrusive, emerged as a promising design principle for balancing usability with accountability.

Finally, the discussions revealed a shift in interaction paradigms, with users envisioning AI not as a static tool but as a co-evolving partner capable of learning and adapting over time. This vision is tempered by ethical concerns, particularly around data privacy and emotional reliance, suggesting that future AI interfaces must be designed with transparent data practices and user empowerment at their core.

In sum, the findings advocate for a human-centered approach to AI-enhanced UI design, one that prioritizes trust, adaptability, inclusivity, and ethical integrity. These insights offer valuable guidance for designers, developers, and policymakers aiming to create AI systems that are not only intelligent but also responsible and responsive to the people they serve.

Limitations and Future Work

Despite its contributions, this study faces several constraints:

Firstly, focus group findings are shaped by participants' personal experiences, biases, and expectations. Some participants might base their views on limited exposure to AI-enhanced UIs, leading to variability in responses that could make generalization difficult. On the other hand, the focus group setting itself presents potential biases, where more outspoken participants may influence quieter individuals, leading to an overrepresentation of certain viewpoints. Secondly, while efforts were made to ensure diverse participation, the study did not fully capture perspectives from highly specialized fields (e.g., healthcare, finance) or underrepresented populations (e.g., individuals with disabilities who rely heavily on AI-driven accessibility tools). The size and composition of the focus groups might not reflect the broader global user base.

Building on the findings of this study, future research could address these limitations through expanded methodologies such as large-Scale Quantitative Studies, and/or user Experimental Testing with Real AI Systems, incorporate user interaction experiments with prototype AI-enhanced UIs, while measuring user efficiency, satisfaction, and trust across different UI configurations.

References

Bayramoğlu, G. (2025). Artificial intelligence from an ethical perspective. In *Futurisks: Risk Management in the Digital Age* (pp. 143–163). Springer. https://doi.org/10.1007/978-981-96-6448-1_7.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*

Cheong, B. C. (2024). Transparency and accountability in AI systems: Safeguarding wellbeing in the age of algorithmic decision-making. *Frontiers in Human Dynamics, 6*. https://doi.org/10.3389/fhumd.2024.1421273.

Hering, M., Zabel, S., Neef, N., & Otto, S. (2025). Predicting individual AI adoption: Personal technological innovativeness on par with AI attitude. *In HCI International 2025 Posters* (pp. 294–303). Springer. https://doi.org/10.1007/978-3-031-94171-9_28.

Krägeloh, C. U., Melekhov, V., Alyami, M. M., & Medvedev, O. N. (2025). Artificial Intelligence Attitudes Inventory (AIAI): Development and validation using Rasch methodology. *Current Psychology*. https://doi.org/10.1007/s12144-025-08009-1.

Li, J., Cao, H., Lin, L., Hou, Y., Zhu, R., & El Ali, A. (2024). User experience design professionals' perceptions of generative artificial intelligence. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. ACM. https://doi.org/10.48550/arXiv.2309.15237.

Müller, S., & Maier, A. (2024). *User control versus automation: Cognitive performance in AI-assisted decision-making*. In F. Davis, R. Riedl, & J. vom Brocke (Eds.), *Information Systems and Neuroscience: Proceedings of the NeuroIS Retreat 2024*.

Muralidhar, D., Belloum, R., Marçal de Oliveira, K., Ashok, A., & Mohammad, P. B. (2025). *The effect of progressive disclosure in the transparency of large language models*. In A. Fred & J. Filipe (Eds.), *Proceedings of the 10th International Conference on Computer-Human Interaction Research and Applications (CHIRA 2024)*.

Polignano, M., Hussain, A., & Hussain, A. (2024). Transparency and accountability: Unpacking the real problems of explainable AI. *AI & Society*. https://doi.org/10.1007/s00146-025-02302-0.

Rezwana, J., & Maher, M. L. (2022). Understanding user perceptions, collaborative experience and user engagement in different human-AI interaction designs for co-creative systems. *Proceedings of the Creativity and Cognition Conference* (pp. 38–48). ACM. https://doi.org/10.1145/3527927.3532789.

Spallazzo, D., Sciannamè, M., & Ceconello, M. (2025). AIXE: A method to evaluate the UX of systems integrating AI. In *User Experience + Artificial Intelligence* (pp. 65–82). Springer. https://doi.org/10.1007/978-3-031-77521-5_5.

Xie, Y., Wu, S., & Chakravarty, S. (2023). AI meets AI: Artificial intelligence and academic integrity—A survey on mitigating AI-assisted cheating in computing education. *In Proceedings of the 24th Annual Conference on Information Technology Education (SIGITE '23)* (pp. 1–7). ACM. https://doi.org/10.1145/3585059.3611449.

Zytko, D., Wisniewski, P., Guha, S., Baumer, E. P. S., & Lee, M. K. (2022). *Participatory design of AI systems: Opportunities and challenges across diverse users, relationships, and application domains*. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts* (pp. 1–4). ACM. https://doi.org/10.1145/3491101.3516506