

AI With and Within User Research Across the Product Lifecycle

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ABSTRACT

Artificial intelligence (AI) is rapidly transforming user research workflows, yet its integration often lacks grounding in human factors principles. While generative and agentic AI can accelerate synthesis, pattern detection, and analysis, overreliance on automated outputs risks automation bias, misplaced trust, and erosion of research judgment. This paper presents a human factors framework for integrating AI with and within user research across the product lifecycle. AI is positioned as an augmentation tool that reduces analytical friction and supports sensemaking, while researchers remain accountable for interpretation and decision-making. The framework maps AI-assisted opportunities across discovery, delivery, and post-launch support. Explicit boundaries for AI use are defined to prevent misuse. By grounding AI in human judgment, this work offers practitioners practical guidance for designing research workflows that preserve rigor, accountability, and human-centered decision-making in increasingly intelligent sociotechnical systems.

Keywords: Human-centered AI, Human–AI collaboration, Product design, Generative artificial intelligence, Agentic AI, User research methods

INTRODUCTION

Artificial intelligence is reshaping how organizations design, evaluate, and deliver products. While AI-first strategies promise competitive advantage, many initiatives fail due to misalignment with business needs and weak return on investment (Kandaswamy, 2025, November, 13). Speed and scale do not inherently generate value (Keen, 2025, Jun, 25). Value emerges when systems solve the right problem, solve it well, and support meaningful human experiences. Generative and agentic AI systems increasingly permeate user research workflows. They accelerate synthesis, pattern detection, and large-scale analysis. However, AI does not replace research judgment. High-profile failures illustrate the risks of misplaced trust and automation bias. For example, Amazon’s experimental AI recruiting system penalized resumes associated with the women due to biased training data (Dastin, 2018, October 10). Similar and more severe issues are becoming more pervasive, and lawsuits are being brought against large human resources technology vendors like Eightfold and Workday (Cowley, 2026, January 21; Callaham, 2026, January 13). More broadly, documented AI safety incidents increased significantly in 2024, spanning hallucinations, autonomous vehicle failures, chatbot errors, fraud, and mental health risks (RAIL Research Team, 2025,

November 3). These examples demonstrate that AI can confidently produce flawed outputs.

When misapplied, AI risks masking uncertainty, reinforcing historical bias, and weakening researcher accountability.

User research grounds outputs in human cognition, competing goals, contextual constraints, and trust dynamics. Human judgment remains essential for interpretation, prioritization, and accountability. For these reasons, UX and Human Factors professionals are concerned about the use of AI in user research. While wielding AI has resulted in a lot of harm, there are still great benefits to the use of AI for user research. AI can also reduce analytical friction, expand the scale of research, and increase the speed at which insight is attained (CleverX, 2026, January 31). The follies occur when AI is positioned as a decision-maker, so this paper frames AI as an augmentation tool for several techniques and delivers a human factors framework for integrating AI with and within user research across the product lifecycle.

Across discovery, delivery, and post-launch, AI can support research workflows by supporting the work needed to answer these three questions:

1. Are we building the right product?
2. Are we building it right?
3. Are customers getting value?

As AI becomes embedded in sociotechnical systems, human factors and ergonomics professionals must lead in defining the boundaries, guardrails, and evaluative criteria that ensure AI strengthens, rather than diminishes human-centered decision-making.

METHOD

This work follows a practice-driven exploratory approach. The framework emerged from iterative experimentation with generative and agentic AI tools within real-world user research workflows across multiple lifecycle stages. Rather than a controlled study, this paper synthesizes applied field experience integrating AI into qualitative synthesis, concept exploration, usability evaluation, analytics interpretation, and post-launch feedback analysis.

RESULTS

Discovery: Are we building the right product?

AI alone cannot determine whether a product is right. Building the right product requires coordinated collaboration among research, design, engineering, product, and data teams. AI enhances this ecosystem when embedded within a human-centered workflow. Key AI Opportunities in Discovery:

- a. *Provisional Personas and Recruitment Support*: AI can draft provisional personas, simulate synthetic participants, and refine screening criteria. This reduces recruitment friction and helps explore early assumptions. However, synthetic outputs cannot replace real participant recruitment.

User research is required to validate assumptions and ensure representation.

- b. *Concept Variation and Scenario Generation*: AI can generate alternative concepts, adapt scenarios to different industries, and synthesize known constraints. Researchers evaluate feasibility, contextual alignment, and strategic relevance.
- c. *Concept Testing Synthesis*: When the right content is collected, AI can summarize feedback and cluster reactions related to trust, clarity, and control. However, AI lacks empathy and cannot interpret emotional shifts or nonverbal signals. Human interpretation is required to distinguish meaningful patterns from superficial summaries.
- d. *Journey Mapping Narratives and Early Pattern Detection*: AI can identify friction points and perform sentiment clustering at scale. Researchers must distinguish correlation from causation and contextualize behaviors.
- e. *Competitive Audits*: AI can identify competitors, summarize positioning, and synthesize reviews. Yet public data reflects surface narratives. User research uncovers deeper motivations, switching barriers, and emotional drivers. Across discovery, AI identifies signals. Researchers determine significance.

Delivery: Are we building it right?

During delivery, AI does not replace evaluation or accountability but can accelerate analysis. Key AI Opportunities in Delivery:

- a. *Usability Testing Analysis*: AI can auto-tag usability issues, suggest severity levels, generate summaries, and extract key quotes or clips. Researchers must verify outputs, prioritize findings, and collaborate cross-functionally.
- b. *Experience and Accessibility Pattern Detection*: AI can detect moments where users guess system intent, flag accessibility risks, and cluster friction patterns. However, researchers interpret contextual nuance and assess real-world impact.
- c. *Statistical and Segment Analysis*: AI tools can compare expert and novice behaviours, run statistical tests, and generate executive summaries. Yet researchers must determine appropriate analyses and evaluate practical significance.
- d. *Product Analytics and Behavioural Anomaly Detection*: Agentic analytics can detect drop-offs, repeated actions without progress, and unusual usage patterns. However, analytics reveal what users do, not why. Qualitative inquiry is required to uncover motivations and contextual constraints.

Across delivery, AI accelerates pattern detection. Researchers ensure methodological rigor and human-centered interpretation.

Support: Are customers getting value?

After a product has launched it needs support from research to continuously evaluate customer needs and expectations as users and their environment

evolves. AI cannot determine customer value independently. However, it can surface early signals. Key AI Opportunities in Support:

- a. *Continuous Feedback Monitoring*: AI can analyze reviews, support tickets, and in-product feedback to detect emerging issues and sentiment shifts. Researchers validate whether trends represent systemic concerns or temporary noise.
- b. *Cross-Study Pattern Abstraction*: AI can cluster recurring usability breakdowns and suggest reusable guidelines. Human oversight ensures patterns are generalizable and ethically grounded.
- c. *Surfacing Unmet Needs*: AI can detect workarounds, repeated feature requests, and task abandonment. However, it cannot fully understand motivations or trade-offs. User research validates opportunity areas through direct engagement.

Across launch and scale, AI surfaces signals. Researchers determine whether those signals represent real value gaps.

DISCUSSION

Across discovery, delivery, and Support, a consistent pattern emerges: AI identifies signals but does not determine significance. AI expands analytical capacity, reduces friction, and scales synthesis. However, it cannot replace:

- Contextual understanding
- Ethical accountability
- Interpretation of emotional nuance
- Cross-functional prioritization
- Empirical validation

Misplaced reliance risks automation bias and erosion of judgment. Responsible integration requires guardrails, transparency, and clear boundaries. Human factors professionals play a central role in defining these boundaries within sociotechnical systems. Table 1 summarizes key AI-supported opportunities across the product lifecycle and highlights the corresponding areas where user research and human judgment remain essential for interpretation, validation, and responsible decision-making.

Table 1: AI opportunities in user research across the product lifecycle.

AI-Application	AI Opportunity	Additional Research Needs
Discovery: Are we building the right product?		
Provisional personas and synthetic participants	Draft early personas, refine screening criteria, simulate edge cases	Validate assumptions with real users; ensure representation; avoid reinforcing historical bias.
Concept variation and scenario generation	Generate alternative concepts; adapt to regulatory, industry, or system constraints	Assess feasibility, desirability, and strategic alignment; interpret cultural and contextual nuances.

(Continued)

Table 1: Continued.

AI-Application	AI Opportunity	Additional Research Needs
Concept testing synthesis	Cluster feedback; summarize reactions related to trust, clarity, and control	Interpret emotional signals, nonverbal cues, and deeper motivations.
Journey and system mapping	Identify friction points; perform sentiment clustering; surface recurring patterns	Distinguish correlation from causation; contextualize behaviours in real-world environments.
Competitive audit	Identify direct, indirect, and substitute competitors; summarize positioning and reviews	Validate meaning of competitive signals; uncover underlying motivations and switching barriers.
Delivery: Are we building it right?		
AI-assisted usability analysis	Auto-tag issues; generate severity suggestions; extract quotes and clips	Interpret impact; prioritize fixes; collaborate cross-functionally.
Experience analysis & accessibility detection	Detect moments of confusion; flag accessibility risks; quantify friction	Evaluate real-world implications; consider diversity, ethics, and inclusion.
Pattern detection & statistical synthesis	Compare expert vs novice behaviours; generate executive summaries; compute metrics	Select appropriate analyses; assess practical significance; ensure methodological rigor.
Product analytics	Detect drop-offs, anomalies, repeated actions without progress	Understand intent and motivation behind behaviours; avoid optimizing superficial metrics.
Support: Are customers getting value?		
Continuous feedback analysis	Monitor reviews, support tickets, behavioural shifts; detect emerging issues	Interpret trends; validate systemic issues vs noise; understand contextual meaning.
Pattern & guideline abstraction	Cluster recurring findings; generate reusable design patterns	Ensure generalizability; avoid codifying premature conclusions.
Surfacing unmet needs	Detect workarounds, feature requests, abandonment patterns	Explore motivations through qualitative inquiry; validate opportunity spaces.

Note: Across discovery, delivery, and support, AI helps identify signals, scale analysis, and reduce analytical friction. However, human judgment remains essential to interpret meaning, validate assumptions, ensure ethical responsibility, and connect insights to real human value.

CONCLUSION

Artificial intelligence is transforming product development, but it does not inherently guarantee better outcomes. Value emerges when systems solve meaningful problems and support real human needs. This paper presented a human factors framework for integrating AI with and within user research across the product lifecycle. Across discovery, delivery, and support after launch, AI can accelerate synthesis and surface patterns. Yet in every stage, AI identifies signals, not significance.

Determining whether we are building the right product, building it right, and delivering value requires cross-functional collaboration and human expertise. AI strengthens product development when it augments human sensemaking rather than replaces it.

REFERENCES

- Callahan, S. (2026, January 13). Applied For A Job Through Workday? Court-Authorized Opt-In Is Now Open. Forbes. <https://www.nytimes.com/2026/01/21/business/ai-hiring-tools-lawsuit-eightfold-fcra.html?register=email&auth=register-email>
- CleverX (2026, January 31). UX research trends 2026: How AI is transforming user research. <https://cleverx.com/blog/ux-research-trends-2026-how-ai-is-transforming-user-research>
- Cowley, S. (2026, January 21). Job Applicants Sue to Open ‘Black Box’ of A.I. Hiring Decisions. The New York Times. <https://www.nytimes.com/2026/01/21/business/ai-hiring-tools-lawsuit-eightfold-fcra.html?register=email&auth=register-email>
- Dastin, J. (2018, October 10). Amazon scraps secret AI recruiting tool that showed bias against women. Reuters. <https://www.reuters.com/article/world/insight-amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK0AG/>
- Kandaswamy, R. (2025, November, 13). Be AI-First to Outperform Your Competition by 2028. <https://www.gartner.com/en/articles/ai-first>
- Keen, E. (2025, Jun, 25). Gartner Predicts Over 40% of Agentic AI Projects Will Be Canceled by End of 2027. <https://www.gartner.com/en/newsroom/press-releases/2025-06-25-gartner-predicts-over-40-percent-of-agentic-ai-projects-will-be-canceled-by-end-of-2027>
- RAIL Research Team (2025, November 3). AI Safety Incidents of 2024: Lessons from Real-World Failures. A comprehensive review of documented AI failures and their consequences. <https://responsibleailabs.ai/knowledge-hub/articles/ai-safety-incidents-2024>