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INPLASY

Technology Acceptance of Generative AI in Design Practice: A Systematic Review of TAM- and UTAUT-Based Studies (2021–2025)

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ADMINISTRATIVE INFORMATION

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 April 2026 and was last updated on 1 November 2026.

INTRODUCTION

Review question / Objective This review addresses these gaps by systematically synthesizing recent studies that employ TAM, UTAUT, and related frameworks to investigate GenAI adoption in design practice. Specifically, it aims to (1) identify the key factors influencing participants' intention to use GenAI in creative practice; (2) examine how these factors are conceptualized and measured in technology-adoption research; and (3) clarify the relationships among determinants, intention, and sustained engagement. The review contributes to understanding the psychological, ethical, and socio-creative processes shaping GenAI adoption in design practice.

Rationale The rapid development of generative AI has led to increasing research on how designers adopt AI tools, often using TAM and UTAUT frameworks. However, existing studies are fragmented across contexts and variables, making it difficult to form a coherent understanding of adoption patterns in design. This study conducts a systematic review to synthesize empirical evidence and clarify key factors influencing AI adoption in design practice.

Condition being studied Generative AI (GenAI) refers to artificial intelligence systems capable of producing design-related content such as images, text, and visual concepts. In design contexts, these tools are increasingly used by designers for ideation, visualization, and prototyping. The condition examined in this study concerns how designers adopt and use GenAI tools in creative workflows, including the cognitive, motivational, and contextual factors influencing their acceptance and continued use.

METHODS

Search strategy A systematic literature search was conducted using Web of Science and Scopus to identify peer-reviewed journal articles published

in English between 2021 and 2025 (for TAM-related studies in Scopus: 2020–2025, based on database configuration). Additional records were identified through reference management-assisted searches (Mendeley) and manual reference screening. This time frame was selected to capture the rapid emergence and application of generative AI technologies in design contexts since 2021. The search strategy combined model-related keywords with design- and AI-related terms, with filters applied to restrict document type and publication year. Although the search strategy used broad AI-related keywords, studies were retained only if they explicitly focused on generative AI technologies in design contexts.

Participant or population The review includes studies involving designers, design students, and creative practitioners who engage with AI or generative AI tools in design-related tasks. These participants typically represent individuals involved in creative design processes such as ideation, visualization, and prototyping. Studies focusing on general consumers or non-design populations were excluded unless they were directly engaged in design-related activities.

Intervention The review examines the use of AI and generative AI (GenAI) tools in design contexts as the primary exposure. These include systems that support design-related tasks such as ideation, visualization, prototyping, and content generation (e.g., text-to-image and generative assistants). The focus is not on a specific intervention but on how such tools are adopted and used by designers, as examined through technology acceptance frameworks such as TAM and UTAUT.

Comparator Not applicable. This study is a systematic review of observational and empirical studies and does not involve a predefined comparative intervention or control group.

Study designs to be included The review includes empirical studies employing quantitative, qualitative, and mixed-method designs. Quantitative studies are primarily survey-based and often use statistical modeling approaches such as structural equation modeling (SEM) or partial least squares (PLS). Mixed-method studies combining surveys with interviews or case-based analyses are also included, as well as a small number of qualitative studies based on interviews or observations. Conceptual papers, reviews, and non-empirical studies are excluded.

Eligibility criteria The review includes empirical, peer-reviewed journal articles published in English between 2021 and 2025 that explicitly apply TAM, UTAUT, or their extended or integrated variants to examine AI or generative AI use in design-related contexts. Eligible studies involve designers, design students, or creative practitioners engaged in design tasks such as ideation, visualization, prototyping, or creative production using AI technologies.

Studies were excluded if they were conceptual or review papers, conference proceedings, gray literature, or focused on general information technology use without a design context. Studies involving non-design populations were excluded unless the context explicitly involved design-related activities. Studies without accessible full texts or with insufficient methodological reporting were also excluded.

In cases of borderline relevance, studies situated in adjacent domains (e.g., interface design, Industry 4.0 applications, or consumer-oriented design contexts) were included if they explicitly examined AI-related design interaction or decision-making processes aligned with TAM/UTAUT constructs.

Information sources The primary information sources for this review were the Web of Science and Scopus databases, which were used to identify peer-reviewed journal articles relevant to AI adoption in design contexts. The search covered studies published between 2021 and 2025, with an extended range (2020–2025) applied in Scopus for TAM-related studies due to database indexing configurations.

Additional records were identified through reference management-assisted searches using Mendeley and manual screening of reference lists from relevant articles to ensure comprehensive coverage. Only peer-reviewed journal publications were included to maintain methodological rigor, while conference papers and gray literature were excluded.

No direct contact with authors, trial registries, or unpublished datasets was used. All included data were derived from publicly available published studies.

Main outcome(s) The review examines outcomes related to AI adoption in design contexts, including behavioral intention, actual use, and continuance intention. It also summarizes relationships among key TAM/UTAUT constructs (e.g., perceived usefulness, ease of use, social influence) and extended factors such as trust, risk, and motivation. Outcomes are reported as patterns of associations across studies rather than effect sizes.

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Quality assessment / Risk of bias analysis Methodological rigor was appraised with the Joanna Briggs Institute Critical Appraisal Tool (JBI CAT) for quantitative and mixed-method studies (Munn et al., 2020) (see Appendix B). This appraisal complements the PRISMA-guided review process by providing a structured evaluation of methodological quality. Eight domains were rated (0/1): clarity of aims, appropriateness of design, sampling adequacy, measurement validity/ reliability, analytical transparency, confounder/bias control, interpretation–data congruence, and reporting clarity. Three authors independently evaluated all studies across the eight domains. Inter-rater agreement was high (Fleiss' $\kappa = .86$), indicating almost perfect agreement (Landis & Koch, 1977), and discrepancies were resolved through consensus discussions. A threshold of ≥5/8 signified acceptable quality; all included studies met this threshold. The study-level appraisal matrix records 34 studies as high quality (scores 7–8) and three as moderate quality (scores 5–6).. Common weaknesses involved limited sampling detail and partial bias discussion, while strengths included precise theoretical alignment and rigorous analytics (SEM/PLS, fsQCA, Mixed method).

Strategy of data synthesis Data synthesis employed a combined approach of quantitative attribute description of publications and qualitative thematic analysis. The quantitative component analyzed structural attributes of the literature, including publication year, country, author, and theme distribution. Keyword co-occurrence analysis and cross-tabulation visualization provided an overview of patterns in AI-related design research. In addition, the frequency and direction of statistical support for key constructs within TAM, UTAUT, and hybrid frameworks were aggregated using a tally method. This descriptive synthesis provides an overview of patterns within the reviewed corpus without aggregating effect sizes.

Qualitative synthesis followed an iterative thematic analysis process. Three authors independently coded the full dataset in ATLAS.ti, compared interpretations through calibration meetings, and refined a shared codebook before clustering codes into higher-order categories. Disagreements were resolved through consensus rather than statistical agreement coefficients, consistent with established practices in interpretive thematic analysis. This multi-stage interpretive procedure supports analytical rigor while preserving the contextual complexity of qualitative insights. The process ultimately yielded four integrated themes: (1) Theoretical pathways for AI technology adoption in design, (2) Psychological, ethical, and contextual mechanisms of AI adoption, (3) Human-AI collaborative creation and capability development, (4) Sustained engagement and innovation outcomes. Collectively, these themes reflect the coexistence and diversification of perspectives on AI adoption within creative design contexts.

Subgroup analysis Not applicable. This review does not perform formal subgroup analyses. However, variations across studies (e.g., by region, participant type, and research context) are descriptively summarized where relevant.

Sensitivity analysis Not applicable.

Language restriction Only studies published in English were included.

Country(ies) involved China.

Keywords Generative AI, Design Practice, Technology Adoption (TAM/UTAUT), Human-AI Co-creation.

Contributions of each author

Author 1 - QIUXIA ZHU - QZ: Conceptualization, data analysis, interpretation of results, and drafting of the original manuscript.
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Author 2 - Di Zhao - DZ: Validation of data and results.
Author 3 - Ruihua Li - RL: Supervision, review, and contribution to interpretation of the findings.

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