Generative AI: A Systematic Review of Related Interfaces and Interactions

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CHIGREECE CHAPTER
Connect. Engage. Inspire.

Syros September 2025

My Trip. My Way!

Intelligent Interaction
www.i.aegean.gr

UNIVERSITY OF THE AEGEAN

INSANE

ii.ct.aegean.gr

Intelligent Interaction Research Group

https://www.goinsane.gr/

Cross-sectoral activity in the fields of Intelligent Systems and Human-Computer Interaction with applications in the field of Digital Cultural Heritage Management

Year of foundation: **2016**
Part of the **Intelligent Systems Research Lab**
Research group: **10 postdoctoral researchers /doctoral students**
5 active research projects

Scientific coordinator
George Caridakis

Professor
Department of Cultural Technology
& Communication
University of the Aegean

Affiliate
School of Electrical & Computer Engineering (NTUA),
ATHENA Research Center

Literature Review

Education

In classrooms, Gen-AI promises adaptive, personalized learning.

Confusion around AI's role, and interfaces that erode critical thinking by hiding too much, or automating too aggressively

Literature Review

Cultural Heritage

Museums and archives are embracing Gen-AI to tell richer stories.

- **Curators fear that automated experiences will distort meaning**
- **People best positioned to guide design — cultural experts — are often missing from the process**

Literature Review

Arts and creative technologies

Gen-AI tools are unlocking new modes of expression.

- **Many artists feel lost in overly complex or overly simple interfaces**
- **Novices drown in unfamiliar vocabularies, while veterans battle tool limits and version chaos.**
- **Behind the buzzwords, the artist's voice is too often drowned out by the system's defaults.**

What This Research Is About

Gen AI

95

Case studies

2023-2025

Research Field

- **Education**
- **Cultural Heritage**
- **Arts and Creative Technologies**

Relationships

- **Systems and Interfaces**
- **Interactions**
- **User experiences**

Prisma Methodology

Prisma

2023-2025

Keywords

“Generative AI”
“GenAI”
“Education”
“Creative Industry”
“Culture”
“Interaction”
“Generative”
“User Interaction”
“AI” ,”UI”, “UX”
“Chatbot”
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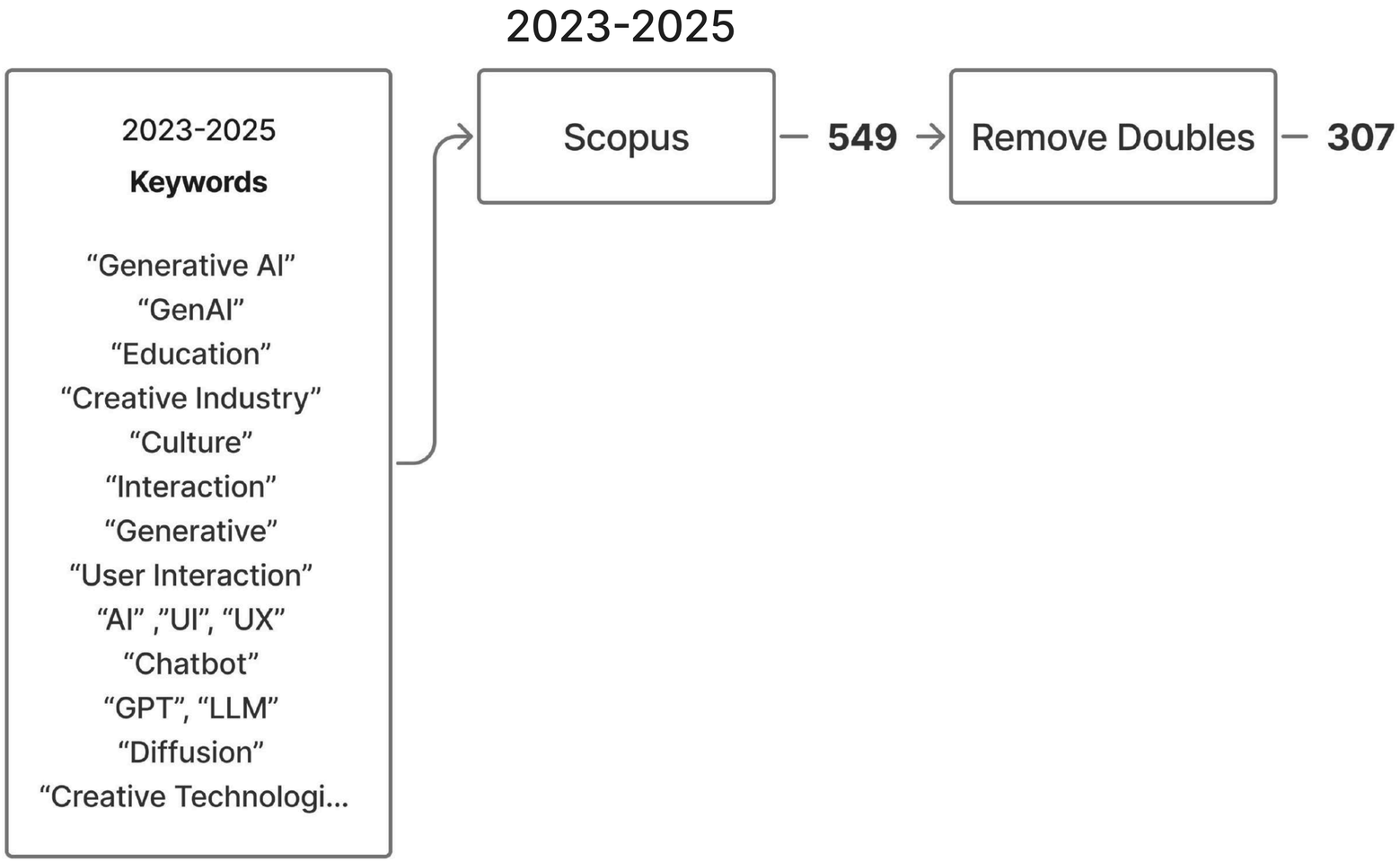
“Diffusion”
“Creative Technologi...

Prisma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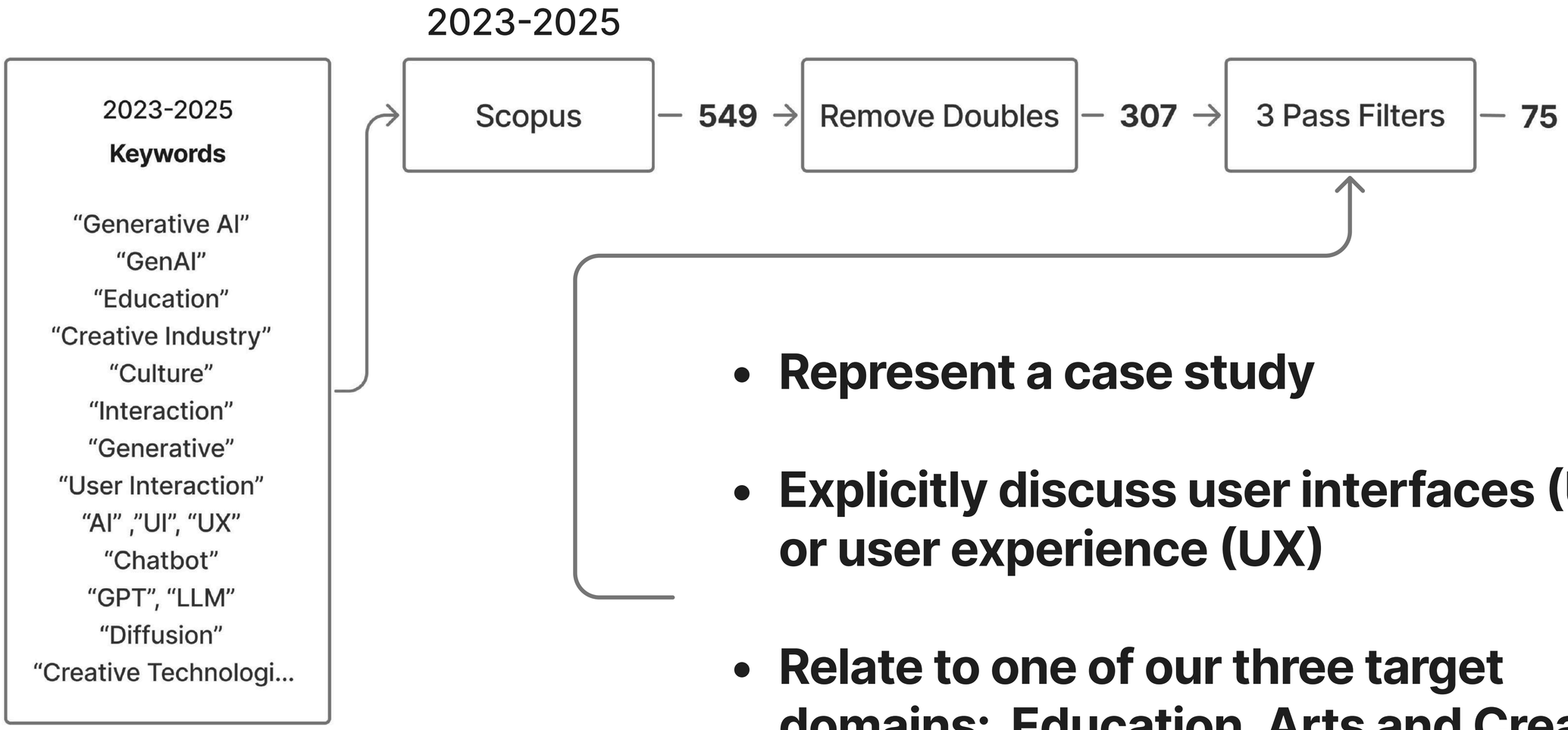

- **Represent a case study**
- **Explicitly discuss user interfaces (UI) or user experience (UX)**
- **Relate to one of our three target domains: Education, Arts and Creative technologies, or cultural heritage.**

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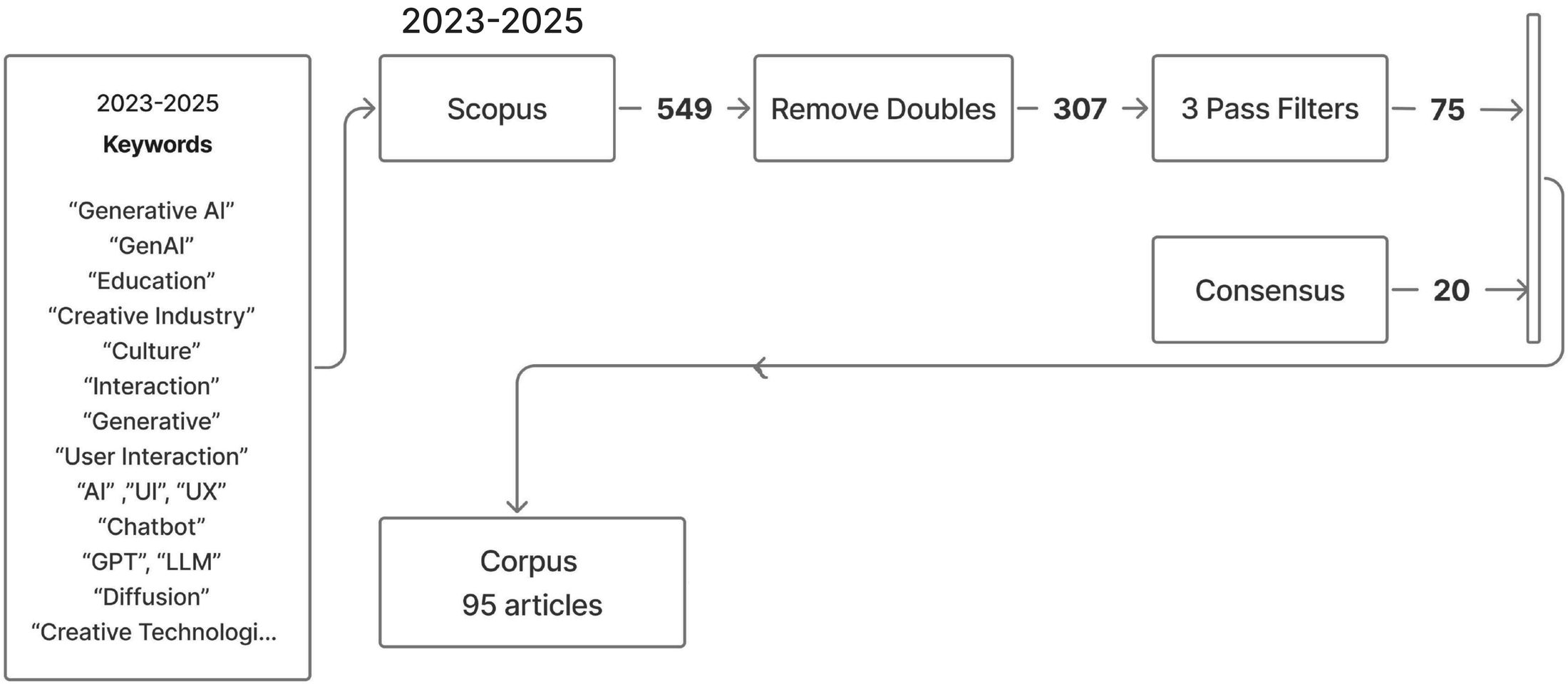
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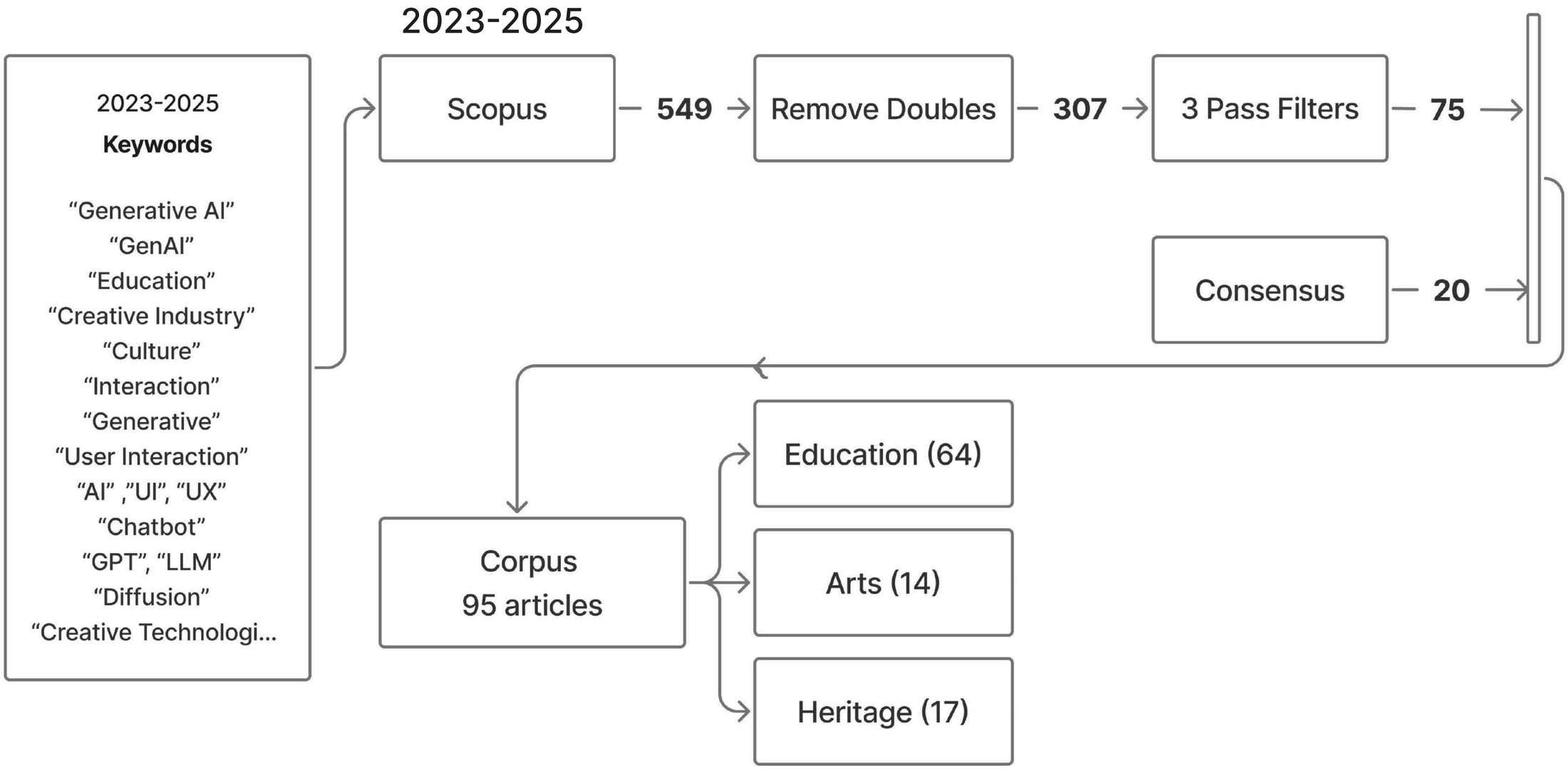
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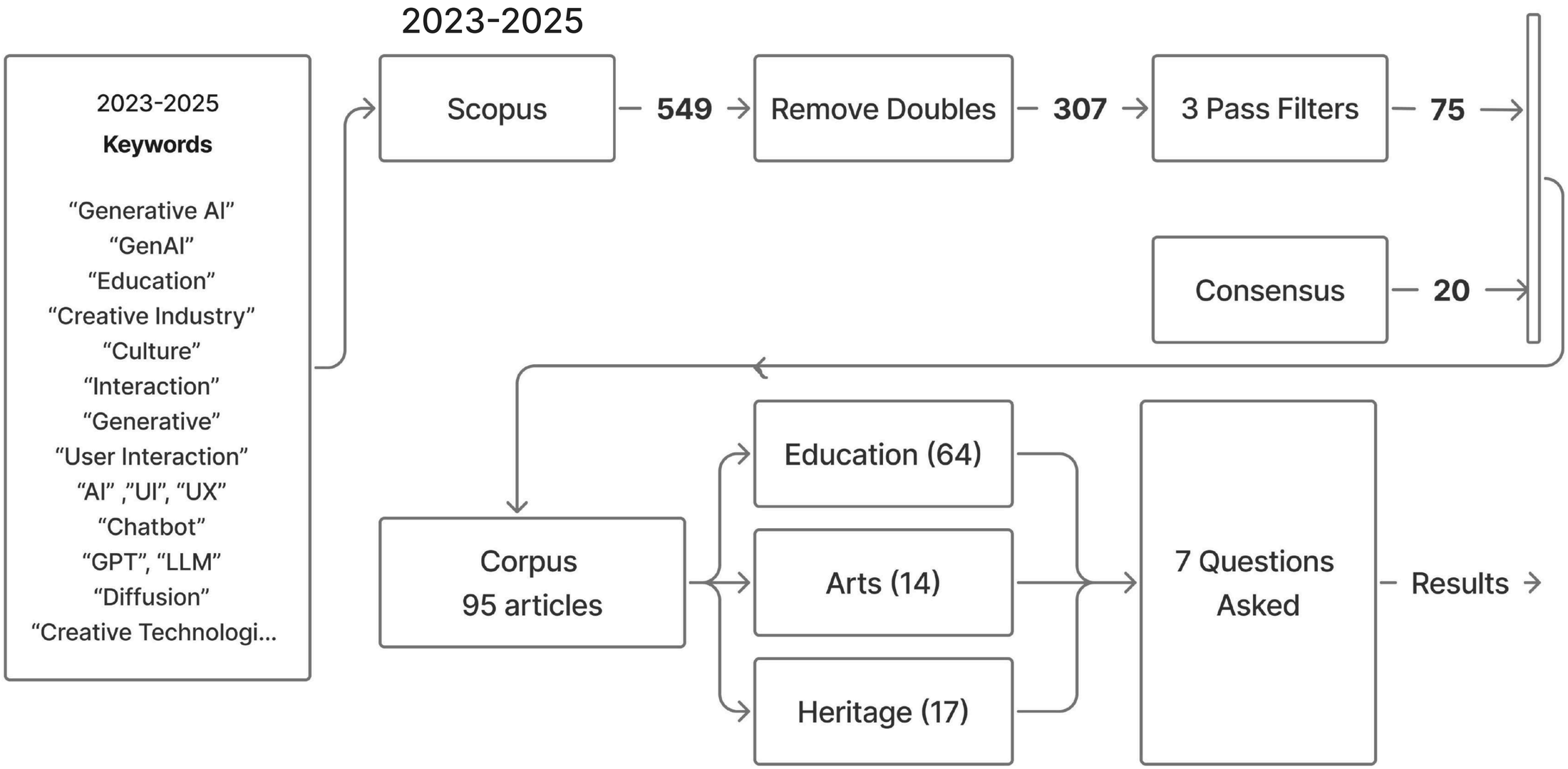
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7 Questions
Asked
Results

Prisma

7 Research questions

- **Q1:** How is Gen-AI applied at the **interface level?** ,
- **Q2:** How is Gen-AI applied at the **interaction level?**
- **Q3:** How does Gen-AI impact **user experience? ,**
- **Q4:** What **modalities** (e.g., image, text, audio, video, 3D, voice, music) are employed? ,
- **Q5:** Can explicit **end-to-end user workflows** be identified? ,
- **Q6:** What **design-phase guidelines** or recommendations are provided? ,
- **Q7:** What **limitations** are noted, and what **future research** directions are suggested?

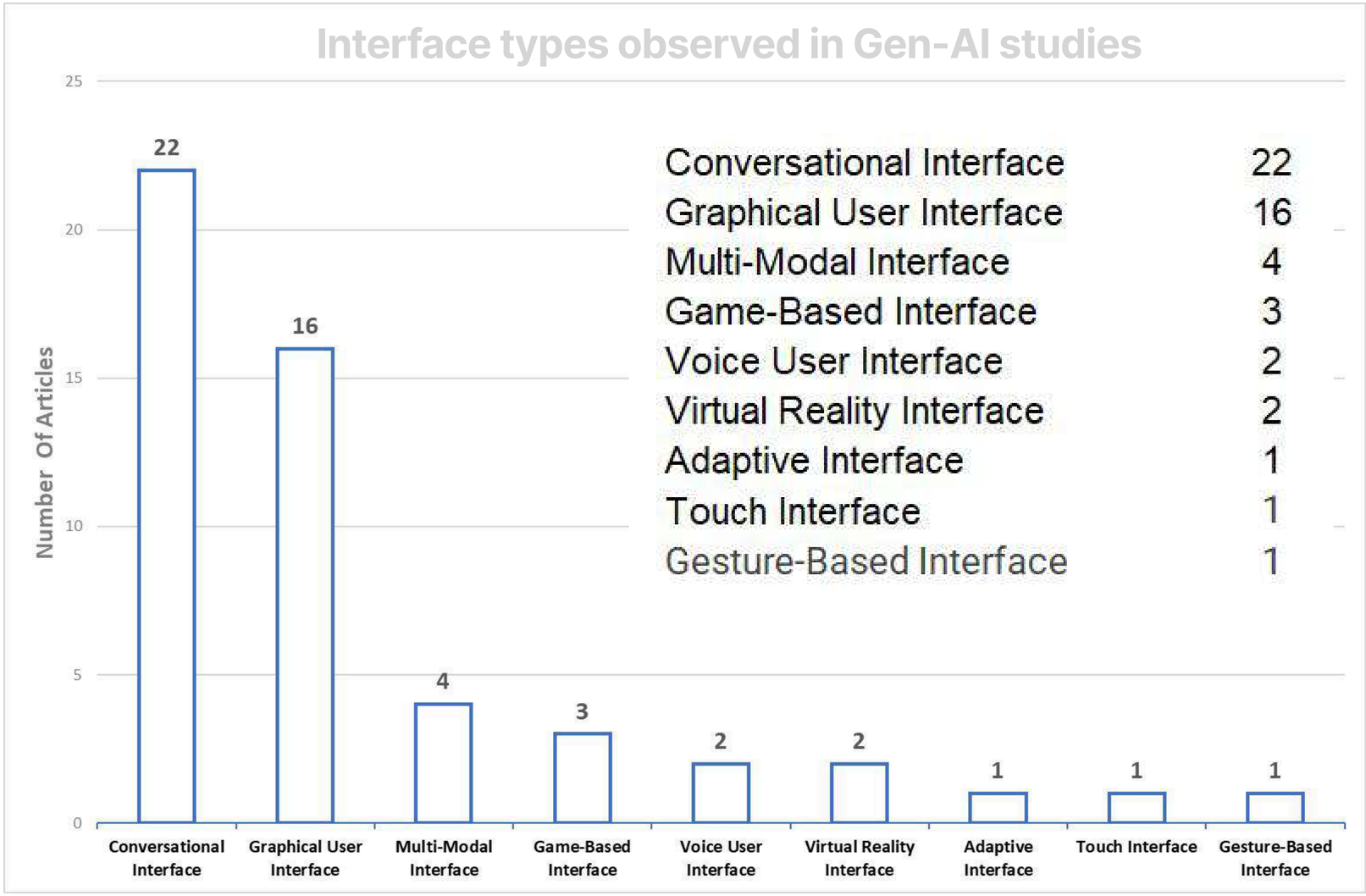
Limitations

- Keyword Selection by Authors
- Abstract-Level Screening
- Experience dimension focused on 15 dimensions
- Each article was classified based on its most prominent experience theme
- Articles that provided relevant context but did not clearly answer a question were labeled as 'unknown’
- Articles only from Scopus and Consensus

Results

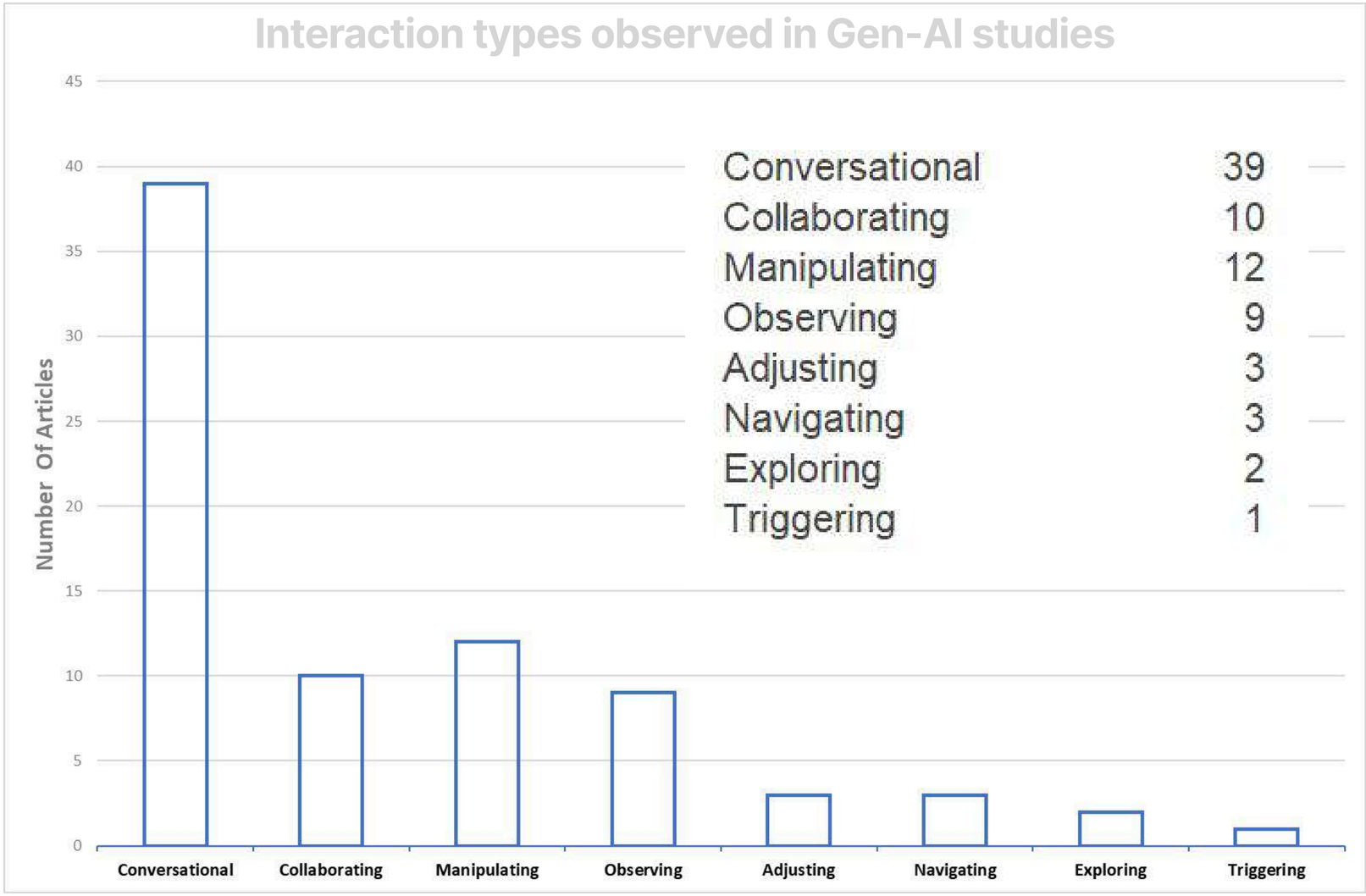
Results

Q1: How is Gen-AI applied at the interface level?



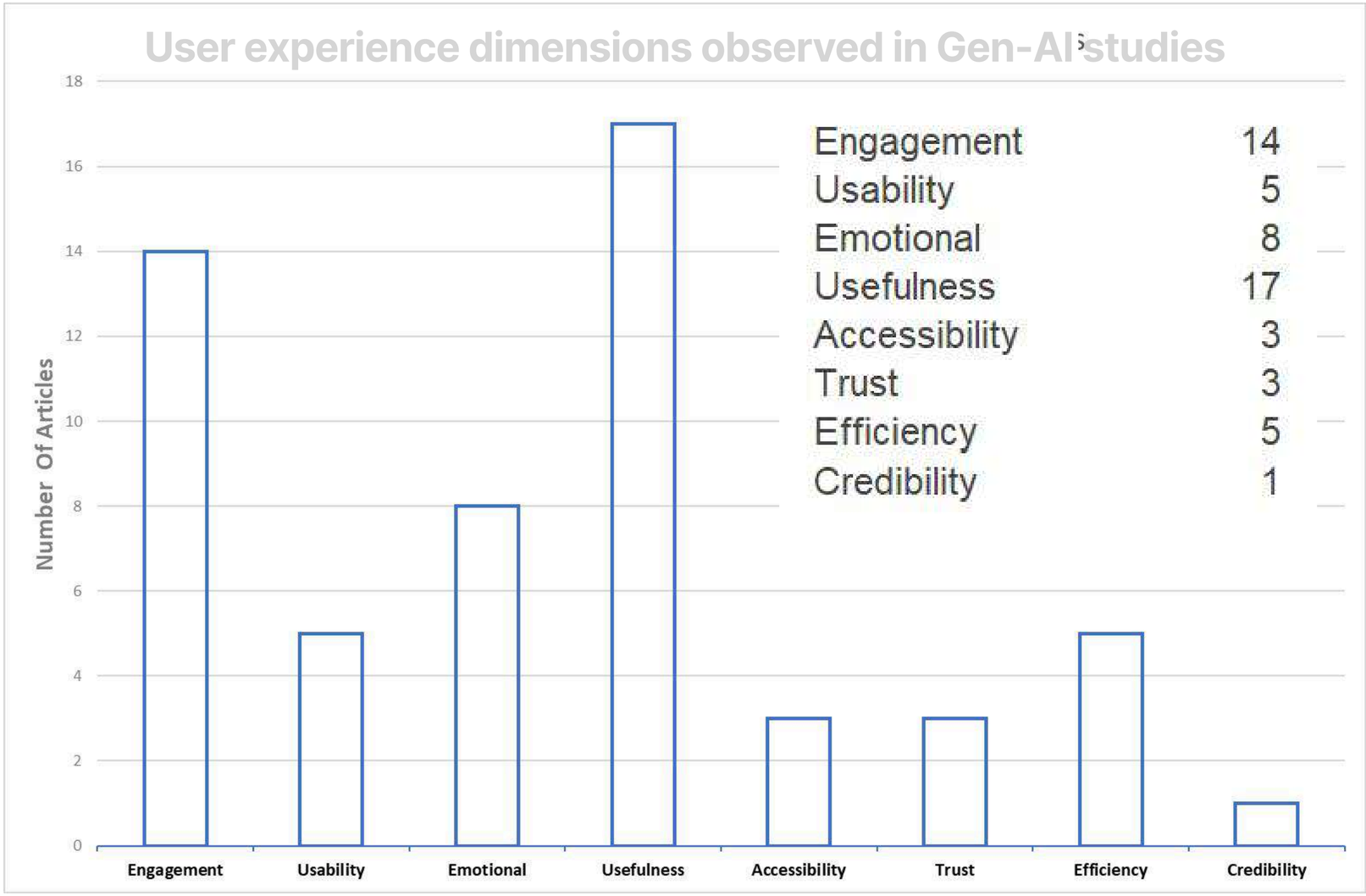
Results

Q2: How is Gen-AI applied at the interaction level?



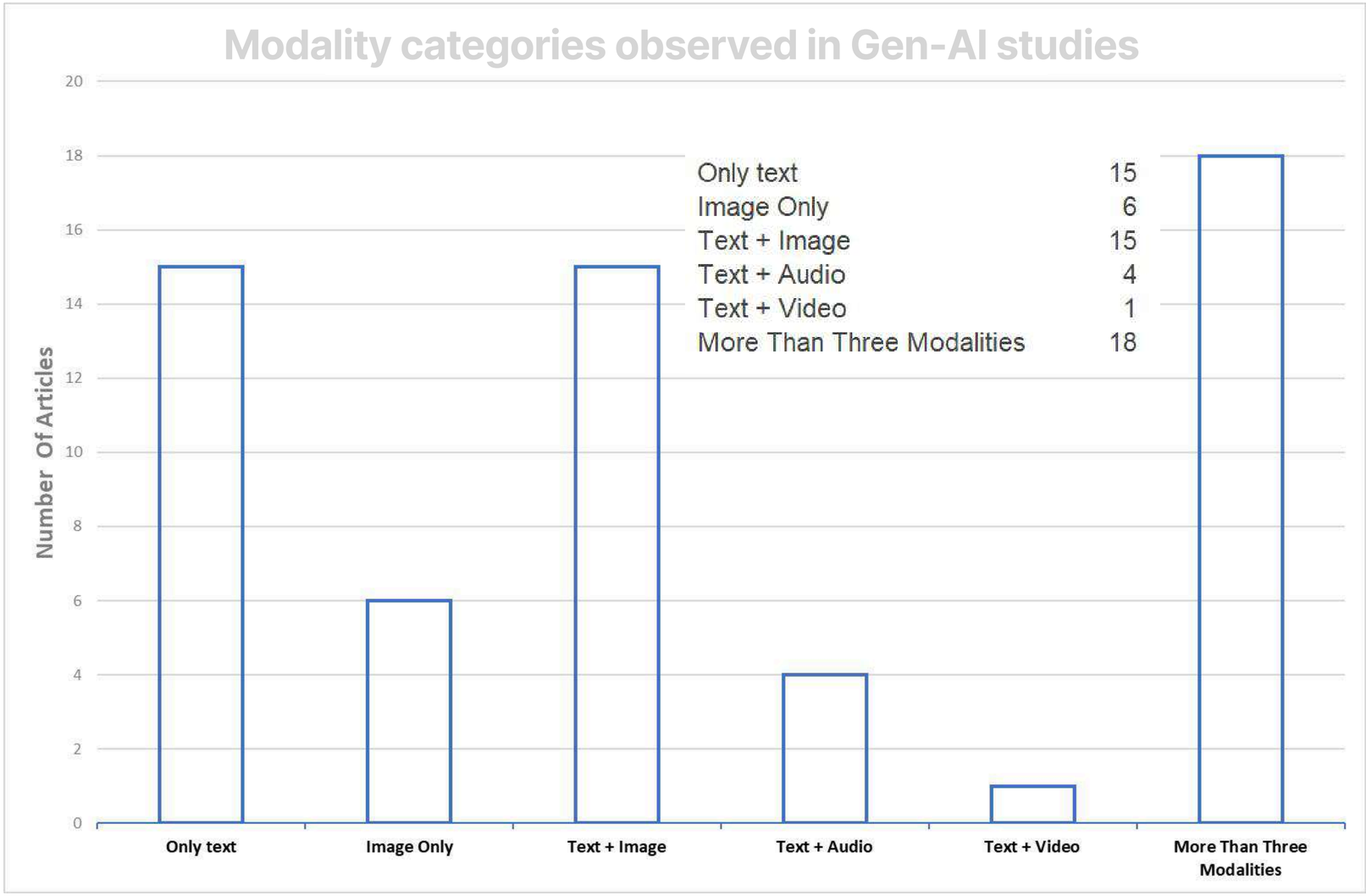
Results

Q3: How does Gen-AI impact user experience?



Results

Q4: What modalities are employed?



Results

Q5: Can explicit end-to-end user workflows be identified?

1. Knowledge Retrieval & Q&A Workflows

Users pose questions in natural language through a chat interface.

The system retrieves relevant information and provides responses grounded in source citations.

2. Generative Creation & Iteration Workflows

Users input prompts to generate an initial artifact

Then iteratively refine it through feedback loops or testing.

- Retrieval workflows are dominant in education.
- Generative workflows serve creative and productivity use cases

Results

Q5: Can explicit end-to-end user workflows be identified?

3. Simulation & Role-Play Workflows

Users engage with AI-driven personas in simulated scenarios

Often for training, assessment, or critical thinking

4. Immersive & Embodied Interaction Workflows

Users interact in VR/AR spaces or with social robots

Real-time AI responses are triggered by voice, gesture, or gaze

- Simulation supports role-play, training, and reflection.
- Immersive workflows point to the future of embodied, emotionally rich interaction

Results

Q6: What design-phase guidelines or recommendations are provided?

Only 2 in 95 articles

Explicitly articulated design-phase strategies for Gen-AI integration

Value-Sensitive Design (VSD)

User-Centered Prototyping (UCP)

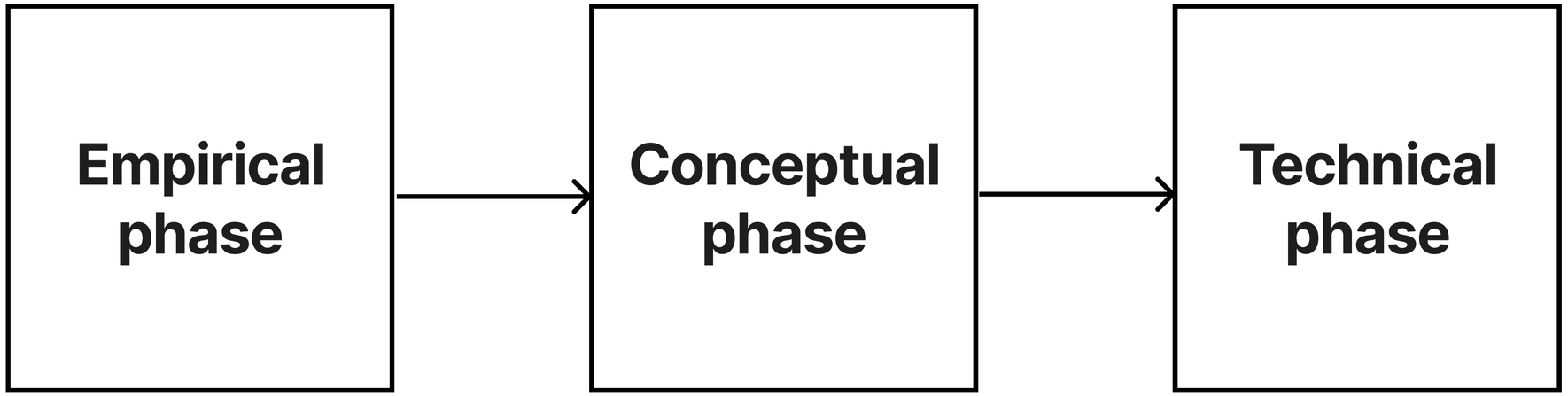
Results

Q6: What design-phase guidelines or recommendations are provided?

Value-Sensitive Design

This study used a structured three-phase process

Ethical alignment and value-grounded design at every stage of Gen-AI system development



Ha Nguye et al. 2025

Results

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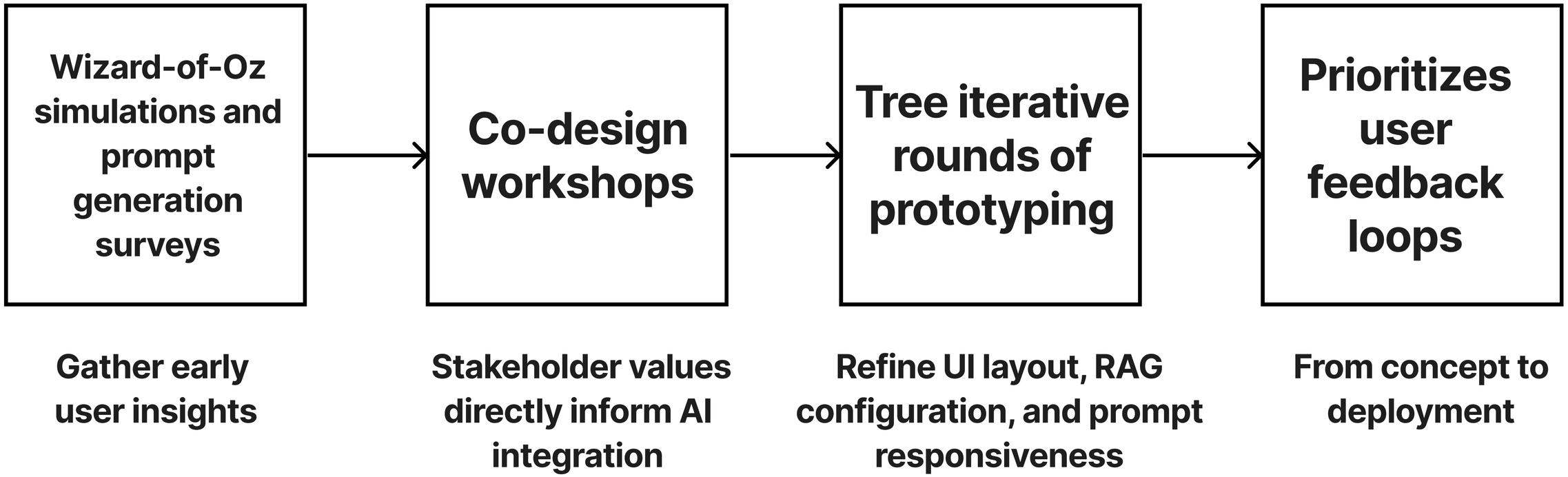

Results

Q6: What design-phase guidelines or recommendations are provided?

Critical gap in current Gen-AI system development:

- While interaction modalities and use cases are diversifying
- Design methodology is lagging behind.

The lack of design-phase strategies raises concerns around:

- Stakeholder misalignment
- Unintended consequences
- Missed opportunities for inclusive, ethical, and transparent design

Results

Q7: What limitations are noted, and what future research directions are suggested?

Reported limitations

1. Output Quality & Consistency

Hallucinated or inconsistent responses were frequently noted

Robustness and error handling remain critical development needs

2. Interaction & UI Design Gaps

Studies reported limited multimodal support, unclear feedback, and non-humanlike avatars

These degrade usability and user trust

3. Generalizability & Sample Constraints

Several studies used small or homogeneous user groups,

This is limiting real-world applicability

Results

Q7: What limitations are noted, and what future research directions are suggested?

Reported limitations

4. Ethical, Bias, and Privacy Concerns

Concerns around data misuse, plagiarism, and bias were prevalent

Safeguards are still underdeveloped

5. Lack of Explainability & Transparency

Users often cannot understand how or why Gen-AI systems make decisions

Provenance and rationale are rarely visible.

6. Technical Performance Limitations

Systems suffered from slow processing or hardware demands

This is affecting usability at scale

Results

Q7: What limitations are noted, and what future research directions are suggested?

Reported limitations

7. Absence of Longitudinal Evaluation

Very few studies examined long-term use or real-world deployment effects

8. Prompt Engineering Gaps

Users struggle with prompt formulation and system expectations.

Results

Q7: What limitations are noted, and what future research directions are suggested?

Future research directions

- **Explainability & Transparency**
  Clearer source attribution, error reporting, and model rationale are needed to build trust and mental clarity

- **Ethics & Policy**
  Development of institutional AI policies, bias detection frameworks, and privacy protections

- **User Education & Support Tools**
  More training programs, assistive prompt tools, and community-driven refinement workflows

Results

Q7: What limitations are noted, and what future research directions are suggested?

Future research directions

- **Multimodal and Inclusive Design**
  Expand support for multi-language, adaptive avatars, and gamified engagement

- **Real-World & Long-Term Evaluation** :
  Shift from lab studies to field deployment, with multi-session user tracking to evaluate lasting impact

Key Implications

Key Implications

Design is No Longer Optional

This is not a technical gap. It's a human one

Future systems must begin with ethical, participatory, and user-centered frameworks, not as an afterthought but as a foundation

Key Implications

Modalities Must Serve Meaning

As interfaces become more multi-modal, we must ask: Does this complexity improve clarity, or confuse it?

Key Implications

Interaction is Expanding
But Trust is Shrinking

If trust erodes, Gen-AI systems fail regardless of how advanced their models are

Key Implications

Show Your Prompts

Prompts are the hart of the systems.

In order to evaluate the results researchers need to know the exact instructions and behavior the system follows

Key Implications

Education is the Test Case and the Opportunity

Education featured most prominently in the studies between the three categories, suggesting it's the primary domain for real-world experimentation.

This is where design ethics, personalization, and explainability must be proven because the stakes involve human learning and agency

Gen-AI

Is not just a tool — it is a transformative medium for interaction. But like any medium, it reflects the intentions of its designers.

If we want systems that are inclusive, transparent, and empowering, then our design and research practices must evolve accordingly

Thank You!

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