

Motivation

Small business owners (SBOs) play a vital role in the global economy, yet many face challenges in creating compelling, brand-aligned advertisements (ads). While GenAI-mediated design tools offer creative potential, they often assume users possess prompt formulation skills and design literacy, abilities that many novice designers, such as small business owners (SBOs), lack.

This mismatch leads to two key challenges:

- **Prompting barriers:** SBOs struggle to translate creative intent into effective AI prompts.
- **Generic outputs:** Current GenAI systems produce ads that do not align with the brand vision of SBOs.

These limitations constrain human-AI co-creation. We explore how GenAI systems can **scaffold user creativity, lower the cognitive burden of prompt formulation, and generate brand-aligned advertisement** that reflects the business’s unique identity.

Research Questions

This study investigates two central questions:

1. *How might GenAI tools be designed to effectively support novice designers—such as small business owners—in navigating the advertisement creation process?*
2. *How can such systems ensure the creation of brand-aligned advertisements that authentically reflect the distinct identity and values of small businesses?*

Architecture of ACAI

Guided by our research questions, we developed **ACAI (AI Co-Creation for Advertising and Inspiration)**, a multimodal generative AI system designed to support novice designers, such as small business owners (SBOs), in producing brand-aligned advertisements. ACAI’s architecture is organized into three layers: User Input, Prompt Processing, and Output Generation (see Figure 1).

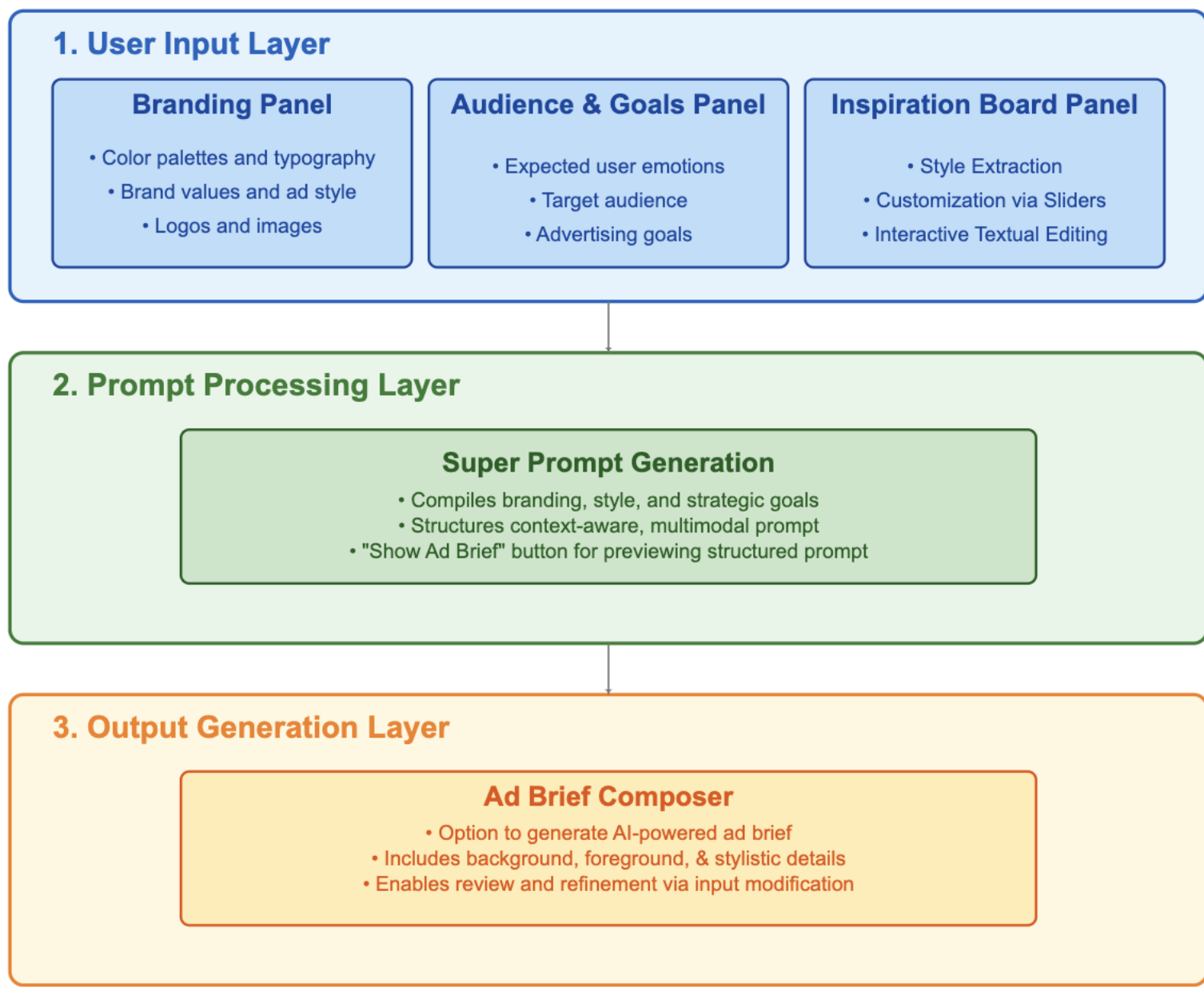


Figure 1. ACAI Architecture

ACAI System Flow

ACAI (AI Co-Creation for Advertising and Inspiration) guides novice designers through a six-step co-creation workflow.

Step 1. Contextual Branding Input: Users provide brand elements: website URL, brand values, logos, fonts, color palette, and six inspirational images.

Step 2. Structured Input Panels: Users articulate brand identity, campaign objectives, and visual aesthetics through three scaffolded panels: Branding, Audience Goals, and Inspiration Board.

Step 3. Super Prompt Construction: All inputs are concatenated into a structured multimodal prompt with brand context, audience intent, and aesthetic preferences.

Step 4. Generative AI Processing: The super prompt is processed via Gemini

Step 5. Ad Brief Output: A structured brief is produced: ad summary, message tone, foreground/background details.

Step 6. Visual Ad Creation: A visual advertisement is created based on the generated brief

ACAI Prototype Design

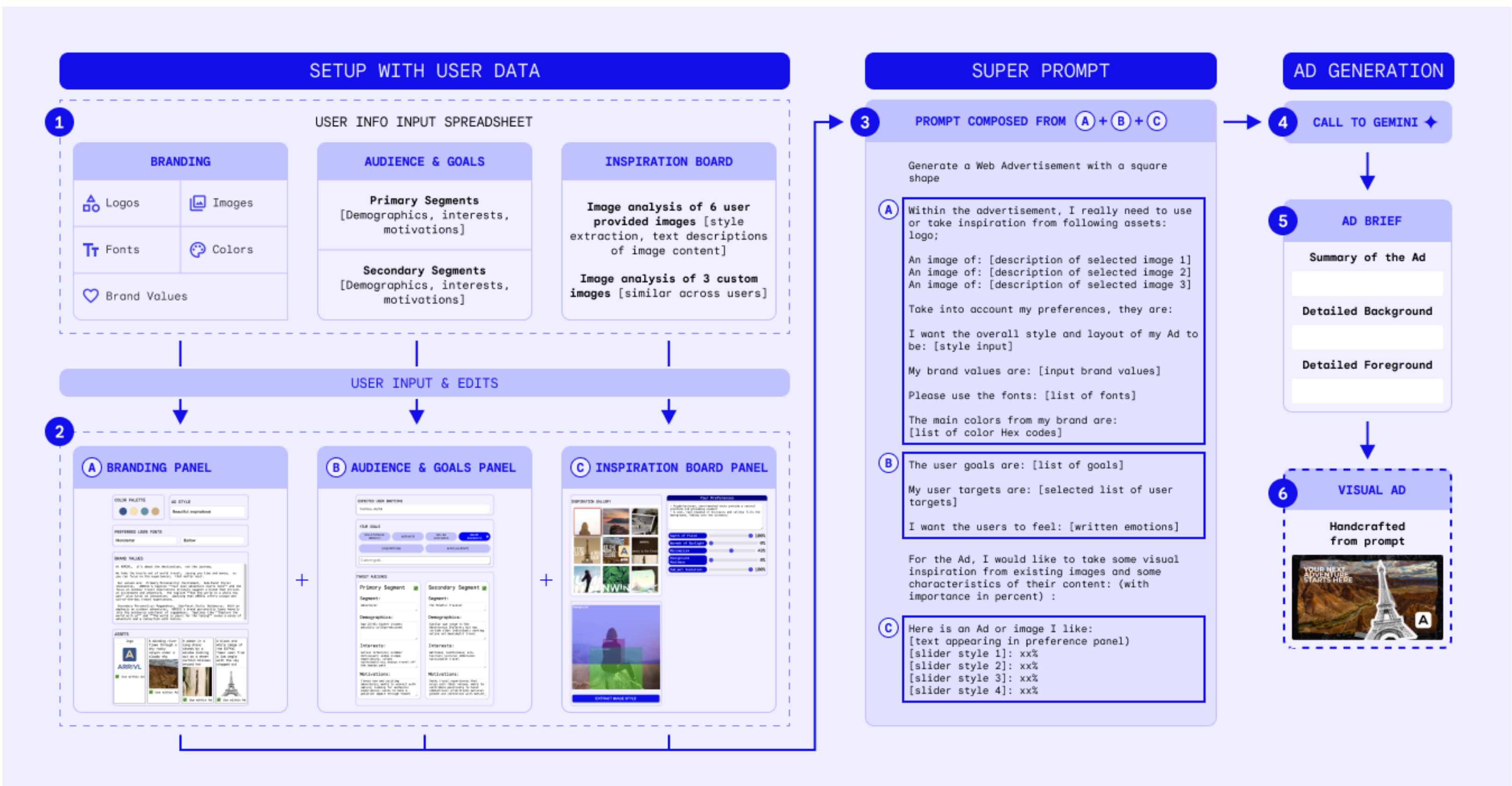


Figure 2: ACAI Prototype – (1) User input, (2) Structured interface, (3) Super prompt, (4) Gemini API call, (5) Ad brief template, (6) Visual Ad creation

User Study Design

We conducted a qualitative user study with 16 small business owners (SBOs) in London across sectors including retail, food beverage, auto services, and lifestyle brands. Participants had varied prior exposure to GenAI tools and were experienced in marketing via platforms like Instagram, Etsy, Canva, and others.

Methodology:

- Participants submitted brand input prior to the session.
- Guided demonstration of ACAI was followed by hands-on use.
- Participants iteratively engaged with the tool to generate ad briefs.
- Pre- and post-session semi-structured interviews were conducted.

The study explored ACAI’s usability, how well it supported co-creation, and the alignment of outputs with brand identity.

Findings

Structured Inputs for Enhanced Creative Control

ACAI’s structured input mechanisms enabled participants to articulate their creative intent without requiring prompting expertise. This fostered a stronger sense of creative agency and control in the co-creation process.

Multimodal Prompts and Style Extraction improved Brand Articulation

ACAI enabled users to express brand aesthetics through images. By highlighting preferred visual elements in the images, users could extract style cues, which complemented text inputs and improved brand-specific ad generation.

Outputs Aligned Better with Brand Identity

Participants described ACAI’s outputs as more reflective of their brand’s tone, values, and visual language, contrasting them favorably with the generic outputs typically generated by off-the-shelf AI tools.

System Transparency Fostered Trust and Adaptability

ACAI’s layered architecture made visible how user input shaped AI-generated outputs. Clear input–output mapping enhanced system transparency, strengthened user trust, and supported meaningful refinement during co-creation.

Design Recommendations

1. Contextual Intelligence

Make AI systems more attuned to business-specific needs through:

- **Business Memory:** Recall brand values, layout preferences, and feedback history.
- **Preference Learning:** Update system behavior based on user interactions.
- **Bi-Directional Feedback:** Enable iterative refinement through user-AI exchange.

2. Interaction Flexibility

Adapt to diverse user needs and tasks with:

- **Fluid Control:** Dynamically adjust AI support based on user expertise.
- **Multimodal Prompting:** Accept inputs via text, visuals, or voice.
- **Structured Interfaces:** Use visual panels to guide input intuitively.

3. Data Stewardship

Ensure trustworthy and transparent co-creation through:

- **Local Data Control:** Allow users to manage data storage and reuse.
- **AI Transparency:** Show how user input shapes system outputs.
- **Privacy-Aware Sensing:** Responsibly use implicit signals (e.g., voice, emotion).

Key Contributions

- Developed ACAI, a multimodal generative AI system that enables novice designers to create brand-aligned advertisements through guided interaction.
- Demonstrated that structured scaffolds and multimodal inputs, including visual style extraction, enhance expressive and inclusive human-AI collaboration.
- Contributed design principles that inform the development of trustworthy, adaptive, and contextually aware generative AI interfaces.