MATEREALIZED

WHERE MEMORIES BECOME BRIDGES TO OUR HOMELAND.

THESIS REPORT

GABE GUTIERREZ

MA HUMAN EXPERIENCE DESIGN INTERACTIONS

ABSTRACT

Materealized is a real-time 3D model generation system driven by voice interaction. As users recount personal memories, the system translates their words into immersive visualizations using generative AI. Designed for displaced and diasporic communities, the project explores how storytelling and emerging technology can preserve cultural heritage when physical artifacts are lost.

Grounded in interdisciplinary research and human-centered design, Materealized culminated in a public exhibition that tested the emotional and cultural resonance of interactive memory-based visuals. It offers an actionable model for digital preservation—where memory becomes experience, and experience becomes connection.

CONTENTS

OVERVIEW

01

MATEREALIZED PROPOSES ...

a progressive design solution that blends human-centered thinking with technological innovation. The project's primary objectives are:

01

To make cultural preservation emotionally resonant and technologically accessible

02

To engage cultural institutions in preserving displaced voices through participatory design

03

To ensure ethical AI generation and representation of people's lived experiences

MISSION

The project was born from the urgency to preserve cultural identities when tangible objects—photographs, heirlooms, homes—are no longer available. Rather than replicating physical artifacts, Materealized interprets personal, spoken narratives using AI to generate rich, abstract visuals that communicate emotional and cultural depth.

The goal is to make memories interactive and alive—moving beyond static documentation toward immersive, participatory experiences that adapt to the stories they contain.

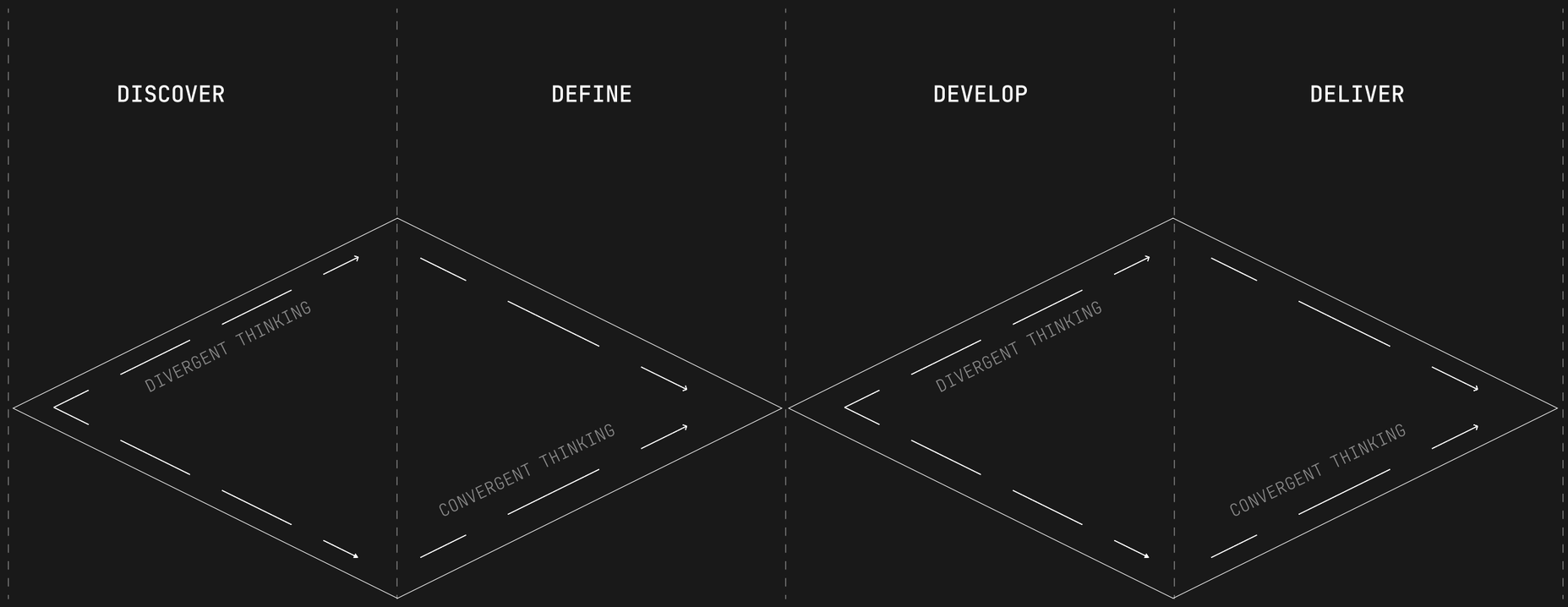
OFFICIAL

THESIS PROJECT STATEMENT

Leveraging generative AI to capture and transform fragmented memories into immersive experiences, reuniting displaced people with their cultural homelands, empowering them to develop stronger cultural identities, sense of self, and communities

DESIGN METHODOLOGY

This project was guided by the Double Diamond Framework, which structured the design process through cycles of divergent and convergent thinking. Each phase—Discover, Define, Develop, Deliver—allowed for iterative exploration, synthesis, prototyping, and refinement. The framework supported a balance between open-ended research and focused problem-solving: uncovering user needs, narrowing the challenge, building and testing immersive tools, and ultimately delivering a culturally resonant experience. Insights from each phase directly informed the next, ensuring the solution evolved responsively and remained grounded in both user experience and technological feasibility.



TIMELINE 2024

The development of Materealized followed a structured timeline aligned with the Double Diamond design framework. From March 2024 to September 2024, the project focused on interdisciplinary research, literature review, user research, and early technology exploration. The Define phase took place in September 2024, synthesizing insights into actionable design challenges and user personas.

Between October and November 2024, the Develop phase involved prototyping, iterative user testing, and technical system refinement. Finally, in late November through December 2024, the project transitioned into the Deliver phase, culminating in the public exhibition, feedback collection, and documentation of future opportunities for scaling and iteration.

03/18 – 09/16	09/17 – 09/25	09/26 – 11/25	11/26 – 12/10
LITERATURE REVIEW TECHNOLOGY RESEARCH USER RESEARCH	PERSONAS INSIGHTS HOW MIGHT WE	TECHNOLOGY DEVELOPMENT PROTOTYPING USER TESTING EXHIBITION DESIGN BRANDING	MARKETING EXHIBIT USER TESTING DOCUMENTATION

DISCOVER

02

EXPLORING MEMORY, CULTURE & TECHNOLOGY

LITERATURE REVIEW

INTERVIEW INSIGHTS

RESEARCH GOALS

CASE STUDIES

SURVEY FINDINGS

The goal of the Discover phase was to explore how displacement and the loss of physical artifacts impact cultural identity and memory preservation. Displacement—whether driven by conflict, disaster, or economic need—disrupts more than geography; it fractures the narrative continuity of culture. Over 114 million people are currently displaced worldwide, with many unable to return home or preserve their cultural legacies in traditional forms (UNHCR, 2023). This rupture is more than physical—it severs the ties between people and the environments that help them remember who they are.

This thesis begins with a central inquiry: How can we preserve and reanimate cultural memory when the physical anchors that hold them—homes, landmarks, and familial rituals—are gone? Materealized emerged in response to this question, aiming to explore how memory, identity, and emerging technologies can intersect to preserve heritage among displaced and diasporic communities.

How can we preserve and reanimate cultural memory when the physical anchors that hold them; homes, landmarks, and familial rituals are gone?

02.01 LITERATURE REVIEW

MEMORY AS CULTURAL INFRASTRUCTURE

At the core of this exploration is the concept of domicide—the deliberate or systemic destruction of home and place—as introduced by University of Victoria, British Columbia, Geography Professor's Porteous and Smith. Domicide does not merely demolish buildings; it dismantles the physical environments that serve as repositories of memory, thereby erasing the communal and spatial rhythms that support identity formation. The consequences are not only psychological but also intergenerational: traditions go unspoken, names are forgotten, and cultural practices are lost to time (Porteous and Smith 98).

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To understand the impact of this disconnection, I turned to the theory of collective memory. As proposed in *On Collective Memory*, memories are shaped and sustained by social groups through shared spaces, language, rituals, and symbols (Halbwachs 38). When these elements are lost or inaccessible, communities must turn to new mediums for cultural preservation.

These types of memory include episodic memory, which refers to the recollection of specific experiences situated in time and space —such as childhood celebrations, the layout of a family home, or the scent of traditional food (Queensland Brain Institute). These memories are deeply sensory, emotionally charged, and intimately linked to cultural identity.

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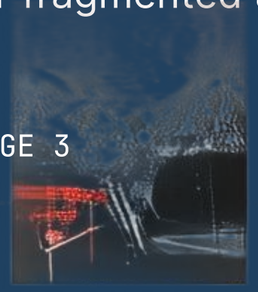
02.01 LITERATURE REVIEW CONT.

Jan Assmann, German cultural historian extends Halbwachs' concept by arguing that collective memory is essential to the construction of cultural identity. It is through cultural memory—ritualized, performative, and communicative practices that communities transmit knowledge across generations. When displacement interrupts this process, the continuity of cultural identity becomes precarious, particularly for diasporic youth born outside their ancestral homeland (Assmann 130).

Neuroscience confirms the fragility of memory under disrupted conditions. As Neuroscientist Phelps explains, the amygdala and hippocampus—the brain regions responsible for emotional memory—encode stronger, more durable memories when experiences are rich in sensory and emotional detail. Without environmental cues and repetition, the brain's ability to recall and transmit these memories weakens (Phelps 195).

This insight shaped the foundation of Materealized: if immersive technologies can evoke these same emotional and sensory dynamics, they may be able to reconstruct the memory environment itself, helping users access forgotten or fragmented aspects of their cultural identity.



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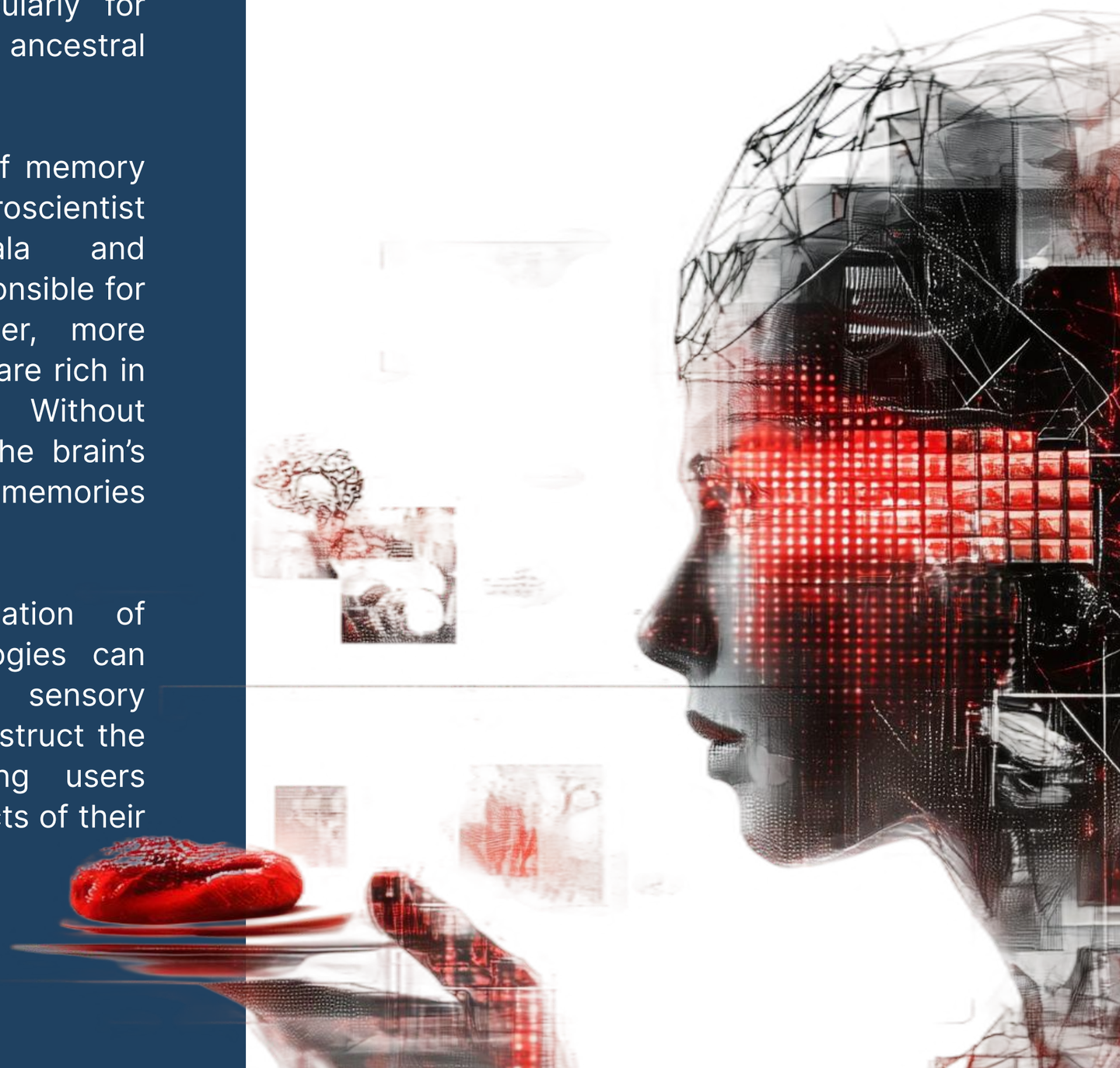

AI IMAGE 4

RECLAIMING MEMORY THROUGH TECHNOLOGY

To explore how memory could be reactivated, I conducted a review of existing and emerging digital tools used for cultural preservation. 3D scanning and modeling technologies have been used to recreate destroyed heritage sites, most notably in UNESCO-led preservation efforts. Oral history archives have also evolved through digital platforms, ensuring the preservation of community narratives across time and geography (Marfleet, 2006).

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Virtual reality (VR) enables users to re-enter spaces they may have never physically visited, while augmented reality (AR) allows them to superimpose personal memories over present-day environments—bridging the past with the now. These tools reinforce the concepts of memory mapping (the connection of specific sounds, colors, or textures to place-based memories) and memory reconstruction, especially for younger generations raised outside their ancestral lands.

Building on this technological foundation, I explored the use of generative AI to create narratives—not simply as static artifacts, but as dynamic, participant-driven experiences. Khurana's *Future of Human Memory* (2020), a speculative design study, offered a provocative look at AI's potential to preserve, but also manipulate, personal history. The project raised important questions about agency, privacy, and representational ethics—all of which influenced Materealized's design constraints (Khurana).

In response, Materealized emphasizes user control, narrative ownership, and cultural sensitivity, positioning AI not as a substitute for human memory, but as a tool for emotional restoration and cultural reconnection.

02.02 CASE STUDIES

RECOLLECTION

Weidi Zhang & Rodger Luo

Recollection is an interactive AI art installation that visualizes memory loss in patients with dementia. It interprets fragmented speech and partial memories into evolving abstract visuals. What stood out about this work was its emotional intimacy and speculative framing—it did not attempt to “correct” memory but instead honored its fragility and impermanence (Zhang and Luo).

This case reinforced the idea that abstraction, not accuracy, may be the most honest way to represent memory. It also validated the use of generative visuals and real-time interaction as powerful storytelling modalities. For Materealized, this affirmed the value of ephemeral, memory-inspired visual language over documentary realism.

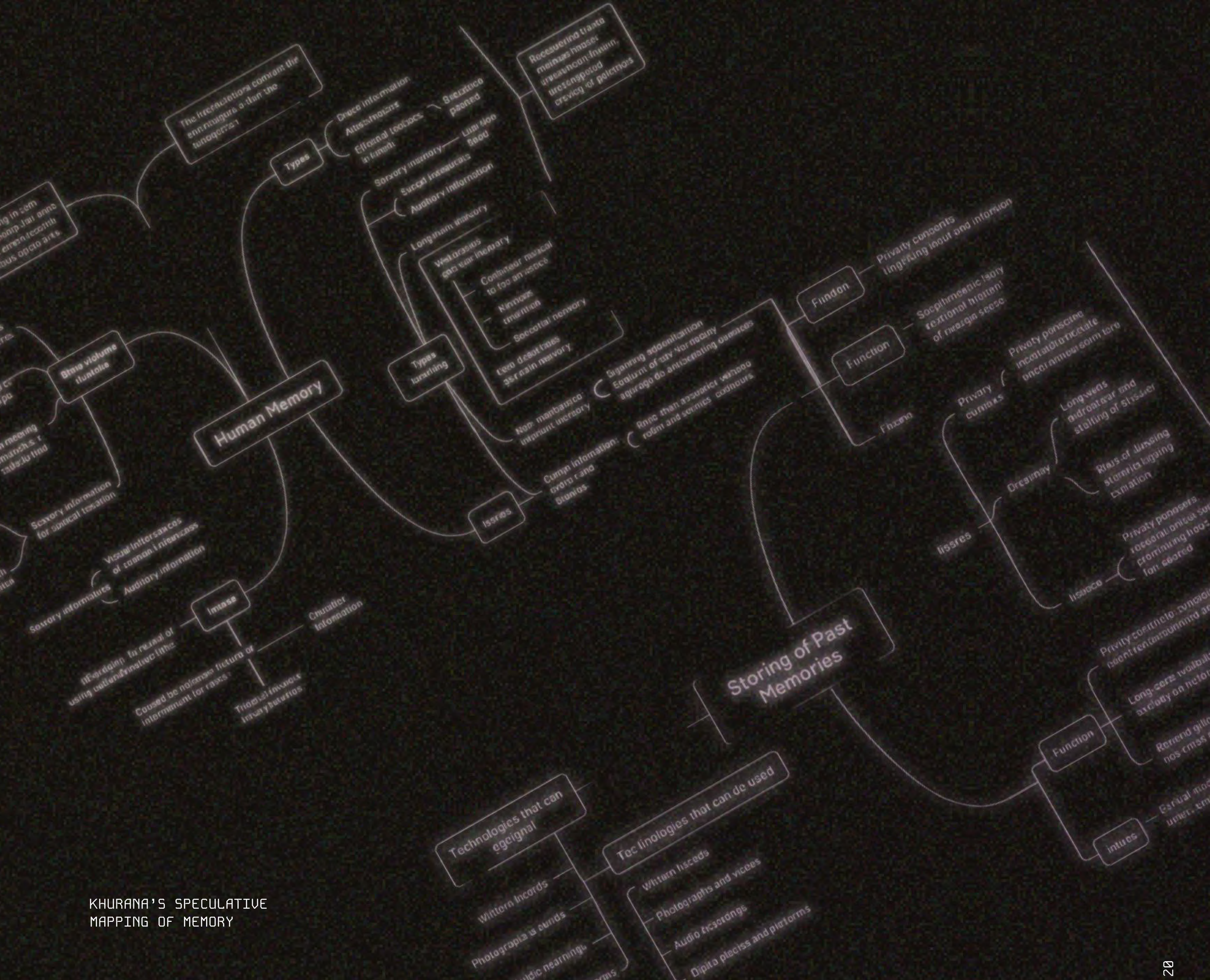
FUTURE OF HUMAN MEMORY (2050)

Palak Khurana

Khurana’s speculative design project imagines a future in which AI systems fully automate memory preservation. It highlights ethical concerns around authenticity, narrative control, and surveillance, questioning whether algorithmically constructed memories can still be considered human (Khurana).

Khurana’s project helped frame Materealized’s critical stance toward generative AI. Instead of treating memory as data to be archived, the system treats it as emotionally alive and relational, requiring care, consent, and contextual accuracy.

Together, these case studies shaped Materealized’s ethical position. They emphasized that memory technologies must not only be immersive and interactive, but also transparent, inclusive, and emotionally respectful.



KHURANA'S SPECULATIVE
MAPPING OF MEMORY

GROUNDING THE WORK IN COMMUNITY

While the problem space of displacement is global, the development of Materealized was intentionally grounded in a specific and deeply personal context: the Filipino diaspora. This decision was shaped by both strategic constraints—limited time, resources, and access—and a desire to create work that was intimate, informed, and community-centered.

Background on the Filipino Diaspora

Migration is primarily driven by economic factors, as individuals seek employment abroad to support families and escape limited domestic opportunities. Filipino workers have historically filled labor shortages in healthcare, domestic work, seafaring, and hospitality—especially in the U.S., Middle East, and Southeast Asia (World Bank, 2023).

The Philippines has a long history of labor migration, with over 10 million Filipinos living abroad, making it one of the world's largest diasporic populations (International Labour Organization).

This global dispersal has resulted in a generation of Filipinos born outside their homeland, many of whom experience a fractured cultural identity. While stories of "home" are shared across generations, the absence of direct immersion leads many to describe themselves as "not Filipino enough"—negotiating the tension between inherited identity and lived experience.

In interviews conducted for this project, these themes surfaced repeatedly: language attrition, fading traditions, familial loss, and a growing urgency to hold onto what remains. In response, Materealized was designed not only as a memory system but as a cultural intervention—a tool to support emotional reconnection, intergenerational dialogue, and heritage reconstruction.

USER RESEARCH METHODS

45 Online surveys
5 Interviews

To inform the development of Materealized, I conducted mixed-method user research with members of the Filipino first and second-generation immigrant community.

Surveys combined Likert-scale questions, open-ended prompts, and short-form responses to evaluate:

- Emotional associations with memory and cultural traditions
- Perceptions of cultural loss or disconnection
- Preferences for storytelling mediums
- Comfort with AI-generated content
- Desires for future tools to preserve and share cultural traditions

Interviews were narrative-based, allowing participants to share family stories, describe experiences of cultural tension, and respond to early visual prototypes. Recordings were transcribed, analyzed, and were later used for prototype development.

KEY FINDINGS

75% expressed concern that Filipino culture —including language, food, and rituals—is at risk of disappearing

60% identified oral traditions and family stories as the most endangered elements

70% felt disconnected from their heritage, especially those born outside the Philippines

80% preferred interactive, visual, or sensory formats for engaging with cultural material

55% were cautious about AI in storytelling, citing fears of misrepresentation

88%, however, were open to using such tools if they offered emotional resonance and user control

QUALITATIVE INSIGHTS

The user interviews provided in-depth perspectives on the challenges of cultural disconnection and the emotional significance of preserving heritage. Key insights include:

Cultural Disconnection: Participants expressed feelings of “whitewashing” and a loss of connection to Filipino identity due to assimilation pressures and generational gaps.

Nostalgia and Traditions: Sensory memories, such as childhood experiences in sari-sari stores and traditional foods like “kwek kwek,” highlighted the deep emotional ties to cultural practices.

Generational Divide: Stories reflected the difficulty of bridging generational gaps, with younger participants longing for ways to better understand and preserve the stories of elders.

These insights reinforced the need for Materealized to prioritize emotional resonance, cultural authenticity, and the preservation of family stories through interactive, visual storytelling.

DEFINE

03

DISTILLING RESEARCH INTO INSIGHTS

USER INSIGHTS

PERSONA

USER JOURNEY

HOW MIGHT WE

Following the Discover phase, the Define phase focused on translating research findings into clear user needs, insights, and design opportunities. This phase refined the broad themes of displacement, memory fragmentation, and cultural loss into a focused, actionable design challenge. The goal was to ensure that the system design for Materealized remained user-centered, culturally sensitive, and emotionally resonant at every stage.

By synthesizing qualitative and quantitative research, developing personas, and mapping emotional journeys, I aimed to ground Materealized firmly within the lived realities of diasporic Filipino communities.

03.01 USER INSIGHTS

WHAT I LEARNED FROM RESEARCH

Through an analysis of survey responses, interviews, and prototype feedback, several core insights emerged. These insights made it clear that Materealized needed to design for reconnection—restoring sensory and emotional memory environments—rather than simple documentation.

FRAGMENTED MEMORIES, PERSISTENT EMOTION

While participants' memories were often incomplete or sensory in nature, emotional connections to these fragments remained vivid and strong. Memories of smells, songs, or places evoked far more powerful emotional reactions than factual recollections.

DESIRE FOR ACTIVE PARTICIPATION

Participants wanted more than passive consumption of heritage—they wanted to actively engage with it. Storytelling, speaking aloud, and seeing their words transformed into something tangible emerged as preferred interaction methods.

CAUTIOUS OPTIMISM TOWARD TECHNOLOGY

Although some participants voiced skepticism about AI's role in cultural preservation, the majority were open to new technologies as long as they offered emotional authenticity and gave users control over how their narratives were represented.

03.02 PERSONA

WHO AM I DESIGNING FOR

Maria is a first-generation Filipino American who grew up in a bilingual household but feels a growing disconnect from her cultural roots. Her parents immigrated to the U.S. in the 1980s, and while she holds pride in her Filipino heritage, she struggles to connect with traditions and stories that weren’t fully passed down. Maria recently had a child and feels a renewed urgency to preserve and share her cultural identity with the next generation.

“I want my child to grow up proud of our heritage and connected to the stories that shaped our family.”

MARIA SANTOS, 34
MARKETING SPECIALIST
SAN DIEGO, CALIFORNIA
FIRST-GEN FILIPINO AMERICAN

MARIA SANTOS

GOALS AND MOTIVATIONS

Reconnect with Filipino culture to pass it on to her child.

Preserve family stories, traditions, and language.

Share personal experiences with a broader community.

Create emotional connections through accessible tools.

FRUSTRATIONS AND CHALLENGES

A lack of resources for learning Filipino languages in an engaging way.

Feeling “not Filipino enough” due to generational and cultural gaps.

Concern over how AI might misrepresent or simplify cultural nuances.

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03.02 USER JOURNEY

HOW WE REMEMBER

1 THE TRIGGER	2 MENTAL RECONSTRUCTION	3 VERBALIZATION OR REFLECTION
Something prompts the person to recall a memory—this could be a conversation, a specific smell, a familiar sound, or even a fleeting thought.	The user recalls fragmented scenes, sensations, or emotions, assembling a mental image of the memory.	The individual tries to articulate the memory, often struggling with gaps or fading details.
Maria smells a dish her grandmother used to cook, sparking memories of family gatherings during childhood.	Maria remembers her grandmother’s hands preparing food, the laughter of her cousins, and the faint scent of jasmine in the air.	Maria shares her memory with her child but struggles to fully describe the intricate details.
NOTE: Emotions: Nostalgia, longing, curiosity.	**NOTE:** Emotions: Mixed—joy from the memory and sadness from its incompleteness.	**NOTE:** Challenges: The lack of clarity in details can lead to frustration or a sense of loss.

4 EMOTIONAL AMPLIFICATION

The act of recalling intensifies emotional connection—triggering joy, longing, sadness, or nostalgia.

Maria feels warmth and gratitude for the memory but also a bittersweet sense of longing for her grandmother.

NOTE: Outcome: The emotional depth makes the memory feel vivid yet incomplete

5 SENSORY IMAGINATION

Unclear elements are filled in with imagination, blending fact and feeling into a fuller mental picture.

Maria imagines the exact shade of her grandmother’s dress and the sound of her voice, even if these details aren’t fully clear in her memory.

6 CONNECTION OR DISCONNECTION

The individual feels closer to the root of their memory—or painfully aware of cultural gaps and forgotten details.

Maria feels a stronger connection to her past but wishes there were photos or recordings to help preserve the details for her child.

NOTE: Outcome: A mix of appreciation for the memory and a sense of loss for its fragility.

STAGE 7 PRESERVATION OR FORGETTING

The individual takes action to record or share the memory—or risks letting it slip into forgetfulness.

Maria writes down her memory in a journal to preserve it, ensuring her child can revisit it later.

NOTE: Outcome: The memory’s longevity depends on how it’s preserved or shared.

03.04 HOW MIGHT WE

DEFINING THE CHALLENGE

Distilling user needs and emotional drivers into a focused question led to the formulation of the core design challenge:

How might we use generative AI and immersive media to help Filipino immigrants and their descendants reconnect with fragmented cultural memories through participatory, emotionally resonant storytelling experiences?

This framing acknowledged both the emotional delicacy of memory work and the ethical complexity of using AI to represent personal and cultural narratives.

HOW MIGHT WE USE GENERATIVE AI AND IMMERSIVE MEDIA TO HELP FILIPINO IMMIGRANTS AND THEIR DESCENDANTS RECONNECT WITH FRAGMENTED CULTURAL MEMORIES THROUGH PARTICIPATORY EMOTIONALLY RESONANT STORYTELLING EXPERIENCES?

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DEVELOP

04

IDEATING
PROTOTYPING
ITERATING

IDEATION

TECHNOLOGY RESEARCH

PROTOTYPE DEVELOPMENT

USER TESTING

SYSTEM REFINEMENT

EXHIBIT DESIGN

The Develop phase focused on translating insights from the Define phase into a functional solution through technical and iterative development. This stage involved creating prototypes to test the feasibility of generative AI in visualizing memories while ensuring emotional and cultural authenticity.

Through iterative user testing, each prototype was refined to address technical challenges, enhance user engagement, and improve the accuracy of visual representations. This phase emphasized the integration of advanced AI tools, such as image generation models and voice-to-text systems, and leveraged feedback loops to ensure the solution met the needs of Filipino Americans seeking to preserve and reconnect with their heritage.

The Develop phase highlighted the importance of aligning technical innovation with user-centered design to create an immersive and accessible storytelling platform.

04.01 IDEATION

THE IDEA

The concept behind Materealized is straightforward: users record personal stories, which are then transformed into immersive visualizations using AI tools.

The goal is to foster cultural connection, preserve traditions, and ensure the authentic representation of memories.

Concept image: An interactive exhibit where the screen becomes a portal into a Filipino immigrant's memory of their rural home—blending voice, visuals, and atmosphere to reconstruct a fragmented but emotionally rich recollection.

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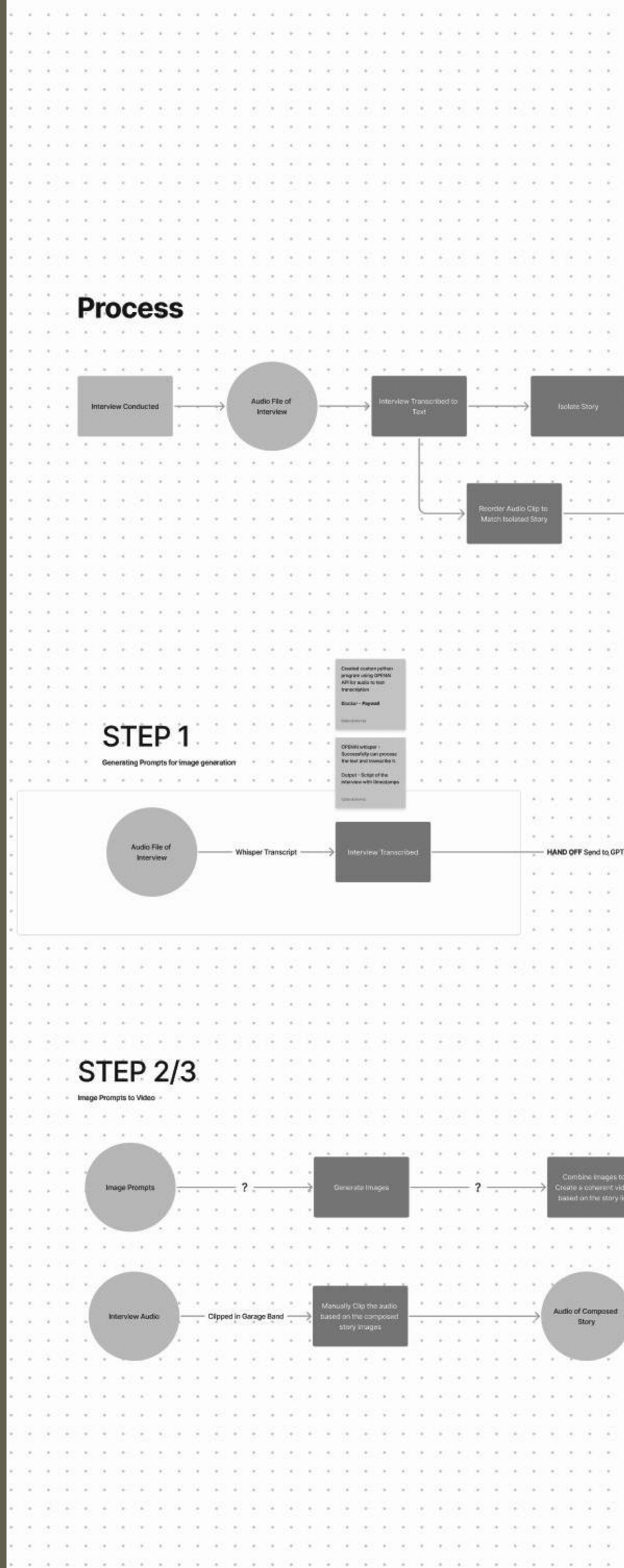
04.02 TECHNOLOGY RESEARCH

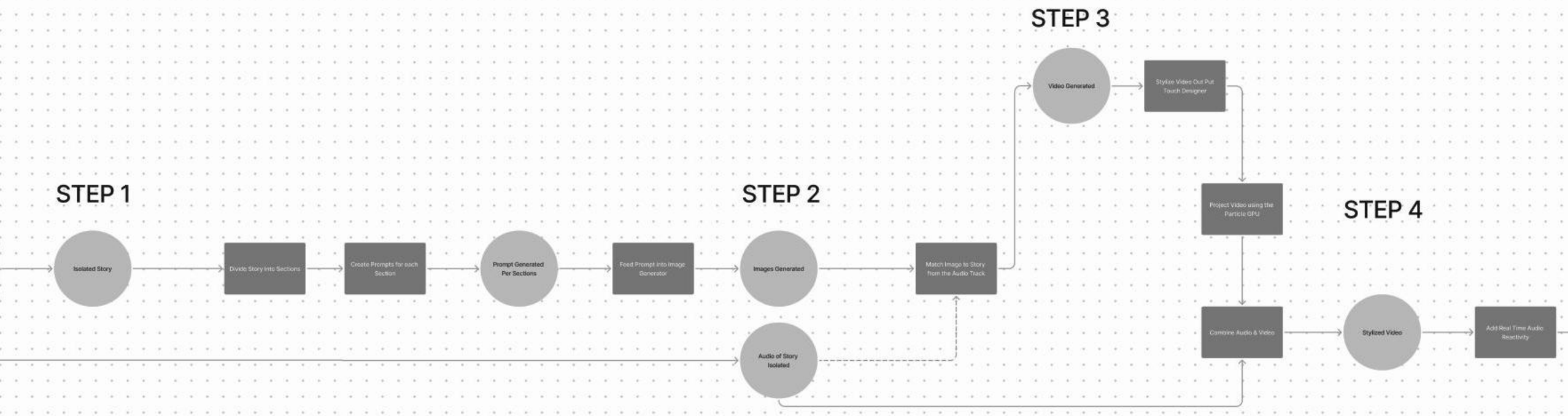
DIAGRAMMING THE TECHNICAL PROCESS

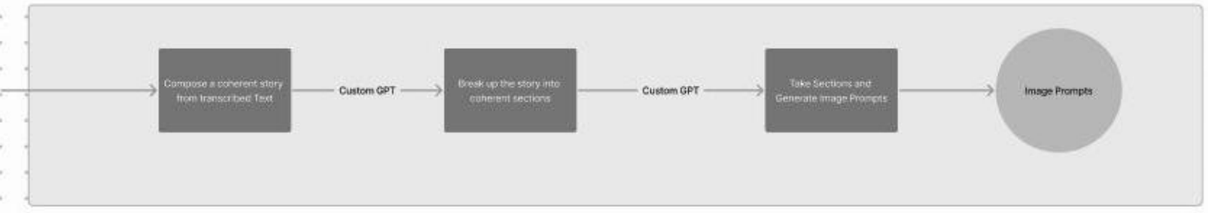
To develop a system capable of transforming voice inputs into coherent, real-time visualizations, I engaged in an extensive process of technical diagramming and workflow testing.

The challenge centered around how to capture non-linear, personal storytelling—often rich in emotion but fragmented in structure—and translate it into prompts that generative AI models could meaningfully interpret. To address this, I tested a range of image and video generation tools, including MidJourney for still imagery and RunwayML for dynamic video generation. In parallel, I utilized GPT models to parse raw transcripts of narratives, deriving contextual meaning and identifying key sensory and emotional elements from unscripted storytelling.

Diagram: A system map showing the different AI technologies and the connection flows between them, illustrating how they work together to create a fully autonomous voice-to-image AI system.

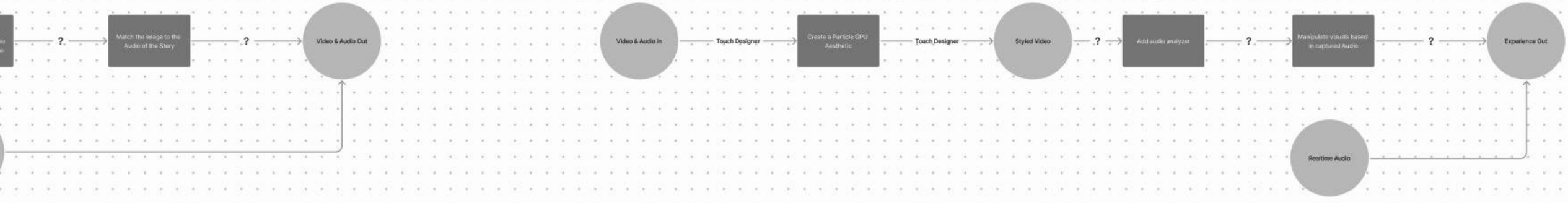






STEP 4/5

Styling the Video



SIMPLIFIED TECH DIAGRAM

During testing, I was able to simplify the technical complexity required to create an initial prototype into a streamlined process: the user tells a story out loud, which is transcribed into text. A GPT model then refines the text and generates detailed prompts. These prompts are used to create images through AI tools, which are then stitched together into a video using editing software like Premiere Pro.

01

AUDIO TRANSCRIPTION

Use a python script to run the whisper model to generate transcriptions of the audio file.

02

PROCESS TEXT

Use chatGPT to process the text and generate prompts

03

GENERATE IMAGE

Use prompts to generate images in Midjourney.

04

STYLIZE IMAGE

Use editing software to stylize the image and cut the audio to match the visuals.

05

EXPORT EXPERIENCE

Video files are exported.

FIRST PROTOTYPE

To create the first prototype, I used narrative clips from participant interviews recounting memories of the Philippines. These audio recordings were processed through the early workflow: transcribed, parsed into prompts, and visualized through generative AI tools.

Interview Documentation: Pre-recorded stories from user research interviews were used as the initial inputs to test the capabilities of the first prototype.

DEVELOPING THE VISUAL LANGUAGE

The visual language for the first prototype was inspired by a photogrammetry-like aesthetic, aiming to evoke the fragmented, ethereal nature of memory. Rather than using fully rendered environments, I generated AI-based images that resembled imperfect reconstructions—similar to how photogrammetry captures spatial surfaces with texture but also with gaps and irregularities.

Generative prompts created with ChatGPT were fed into MidJourney, then imported into TouchDesigner and mapped as particles to create 3D interactive visuals.

AUTHOR GENERATED IMAGE 10

AUTHOR GENERATED IMAGE 11

To give these visuals a sense of depth and movement, I mapped the generated images onto 3D planes using depth maps, creating layers of spatial information.

Within TouchDesigner, these layers were then translated into particle systems, allowing the images to dynamically drift, shift, and breathe in response to user interaction. This technique created an environment that felt both tangible and ephemeral, reinforcing the conceptual framing of memory not as static snapshots, but as living, evolving landscapes.

04.04 USER TESTING

TESTING THE FIRST PROTOTYPE

For early user testing, participants wore VR headsets and experienced a curated sequence of memory visualizations generated from participant interviews. 8 participants listened to original voice recordings while observing the evolving point-cloud environments inspired by the stories.

The goal was to assess whether the combination of sound and dynamic visuals could evoke emotional resonance and a sense of cultural connection.

Feedback indicated that participants felt a strong emotional engagement, often describing the experience as “nostalgic,” “immersive,” and “hauntingly beautiful.” Many noted that the abstract visual style allowed them to project their own emotions onto the scenes, making the memories feel personal rather than distant.

This initial testing validated the potential of Materealized to reanimate fragmented memories in a way that was both participatory and emotionally powerful.

75%

Participants found themes in the story as relatable.

75%

Reported moderate to strong cultural connection

Testing Documentation: The first prototype was tested using VR headsets, allowing participants to experience people’s memories coming to life in an immersive environment.

04.05 SYSTEM REFINEMENT

DEVELOPING A REALTIME VOICE TO IMAGE SYSTEM

Encouraged by the promising results of the first round of user testing, I expanded the system to allow for real-time image generation directly from voice input, fully integrated within TouchDesigner.

Using a Whisper model, live audio was transcribed into text, which was then fed into Stream Diffusion using the XL Turbo model to generate responsive images based on the user's spoken memories.

A secondary model produced real-time depth maps, giving the visuals spatial structure. Within TouchDesigner, these outputs were stylized to match the original photogrammetry-inspired aesthetic developed in the early prototype—maintaining continuity in visual language while enabling fully dynamic, user-driven memory environments.

This evolution allowed the system to move from a pre-processed experience to a truly living, real-time storytelling platform.

CHALLENGES WITH NEWEST PROTOTYPE

Early user testing revealed three key challenges. First, users often struggled to recall and articulate memories in a way the system could accurately interpret. Second, technological limitations sometimes led to misrepresented or incoherent visuals, highlighting the need for more refined real-time generation without relying on manual curation. Third, the system needed better support for observers—those who preferred to experience rather than share stories—by offering a meaningful and engaging passive interaction mode.

Testing Documentation: User testing with the real-time voice-to-image system involved gathering feedback through informal interviews and observations as participants interacted with the system.

OVERCOMING CHALLENGES

To overcome the challenges identified during early user testing, I designed an interactive exhibit that enhances accessibility, emotional engagement, and inclusivity for all participants.

To support storytelling, I introduced “memory slips”—sensory prompts that helped guide users in recalling vivid details about sights, sounds, and emotions, making it easier to articulate meaningful stories.

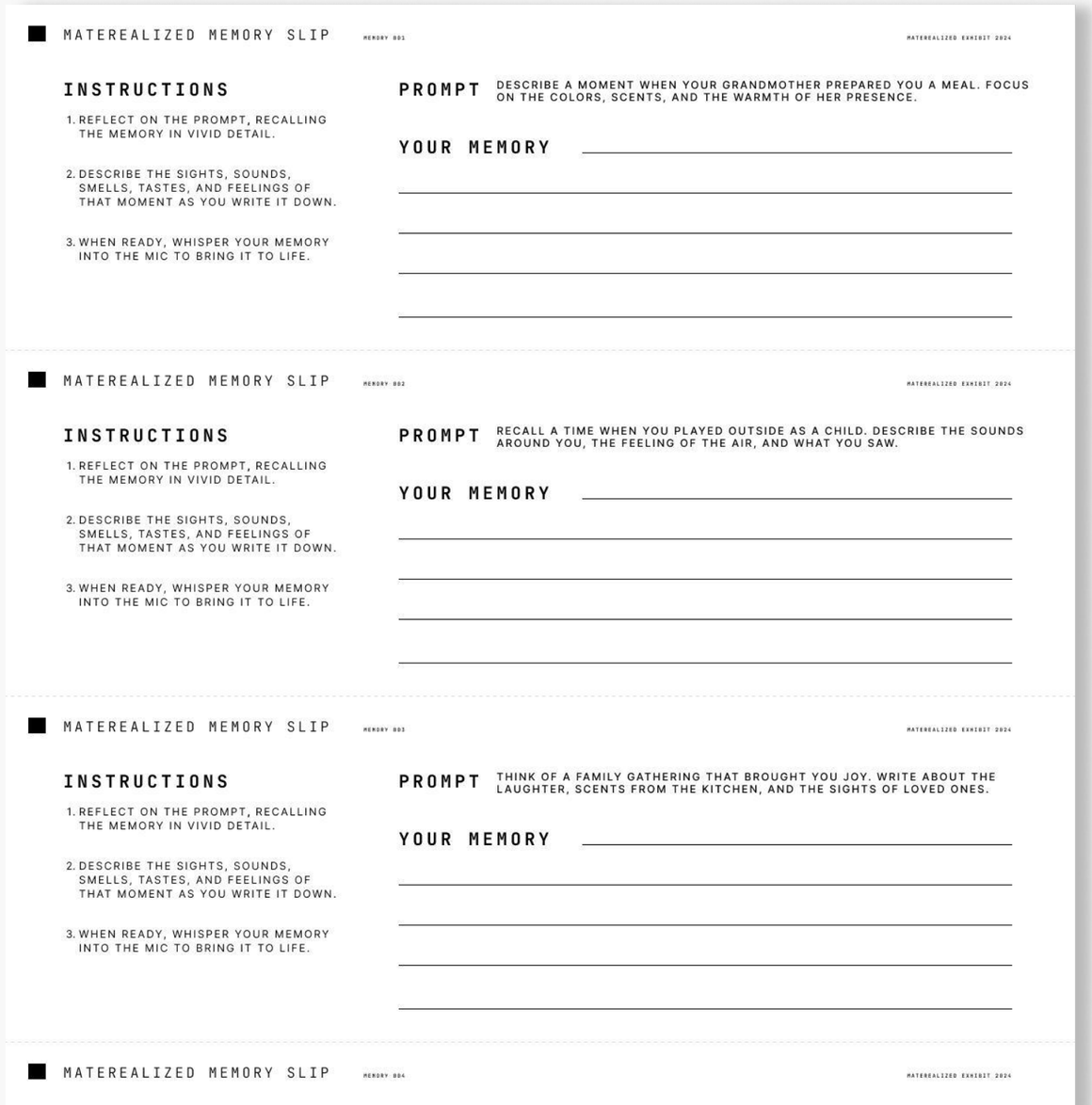
Instead of focusing on literal visual accuracy, I refined the system’s visual output by leaning into abstract representations; images were rendered in black and white to encourage personal interpretation and to avoid misrepresenting or distorting users’ narratives. This shift allowed memories to retain their emotional integrity without imposing rigid, potentially inaccurate visuals.

To engage observers who preferred to experience rather than share stories, the exhibit incorporated dynamic, responsive visuals tied to existing narratives, with body tracking and audio-reactive elements that allowed non-storytellers to interact with the environment.

Together, these adjustments bridged the gap between storytelling, memory representation, and audience participation—making the experience immersive, flexible, and accessible to all users.

MEMORY SLIPS

Memory slips were designed as unique prompts, each encouraging guests to recount a specific moment from their life and guiding them to structure their story with vivid sensory and emotional details. This approach helped the system generate more coherent and emotionally aligned images, ensuring that the visualizations more accurately reflected the essence of their memories.



MATEREALIZED MEMORY SLIP MEMORY 001 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT DESCRIBE A MOMENT WHEN YOUR GRANDMOTHER PREPARED YOU A MEAL. FOCUS ON THE COLORS, SCENTS, AND THE WARMTH OF HER PRESENCE.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 002 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT RECALL A TIME WHEN YOU PLAYED OUTSIDE AS A CHILD. DESCRIBE THE SOUNDS AROUND YOU, THE FEELING OF THE AIR, AND WHAT YOU SAW.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 003 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT THINK OF A FAMILY GATHERING THAT BROUGHT YOU JOY. WRITE ABOUT THE LAUGHTER, SCENTS FROM THE KITCHEN, AND THE SIGHTS OF LOVED ONES.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 004 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

PROMPT DESCRIBE A QUIET MOMENT YOU SPENT IN A PLACE THAT FELT SAFE TO YOU.

MATEREALIZED MEMORY SLIP MEMORY 005 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT RECALL A MEMORY OF WATCHING A SUNSET OR SUNRISE. DESCRIBE THE CHANGING COLORS, THE TEMPERATURE, AND HOW IT FELT TO WITNESS IT.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 006 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT REMEMBER A TIME YOU FELT DEEPLY CONNECTED TO SOMEONE. DESCRIBE THE SOUNDS, THE LOOK IN THEIR EYES, AND HOW THE AIR FELT AROUND YOU.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 007 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.
2. DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.
3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT THINK OF A HOLIDAY CELEBRATION FROM YOUR CHILDHOOD. WRITE ABOUT THE SMELLS, THE MUSIC, AND THE FEELING OF BEING THERE.

YOUR MEMORY

MATEREALIZED MEMORY SLIP MEMORY 008 MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

PROMPT DESCRIBE A MOMENT WHEN YOU WERE TAUGHT SOMETHING MEANINGFUL BY AN

OPEN TO INTERPRETATION

I wanted to evolve the visual language further By abstracting the visuals, the system avoided the risk of misrepresenting users' memories, allowing for open interpretation and preserving the emotional truth of each story without imposing a literal or potentially inaccurate depiction. The following images are stills from images generative images based on users stories.

Materealized Rendered 3D models: A layer of stylization in TouchDesigner softened image details, allowing the person recalling the memory to fill in the gaps with their own imagination.

INPUT

“I remember by 5th birthday...”

OUTPUT

INPUT

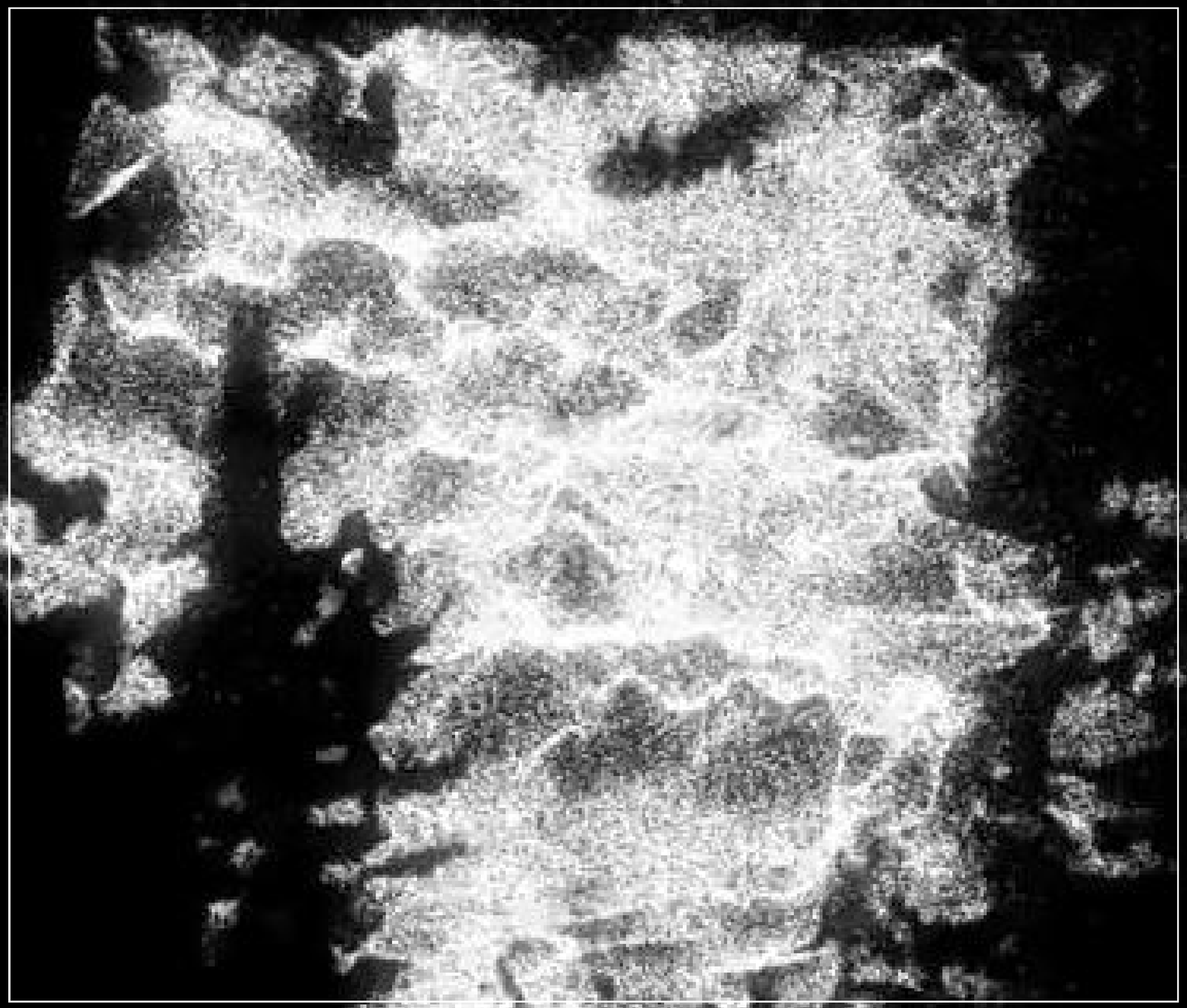
“sitting inside an old indian temple with my aunt...”

OUTPUT

INPUT

“the tips of the pine trees added green to the scene...”

OUTPUT



04.06 EXHIBIT DESIGN

DESIGNING AN EXHIBIT

To design the exhibit, I focused on creating an environment that would enhance emotional immersion and support intuitive interaction with the evolving memory visuals. I developed a spatial layout that included designated storytelling zones, responsive projection areas, and pathways for both active participants and observers.

To better understand how users would move through and experience the space, I rendered the exhibit in Unreal Engine, building a virtual simulation of the gallery environment. This allowed me to test elements like lighting, scale, sightlines, and flow before physical installation. By navigating the exhibit in real time, I was able to refine the positioning of key components —such as microphones, projectors, and interactive visuals—to optimize engagement and ensure that both storytellers and observers could connect meaningfully with the unfolding memory narratives.

Unreal Engine 3D Render: Visualization of the exhibit design, showing spatial layout, interactive zones, and projection areas used to simulate the user experience.

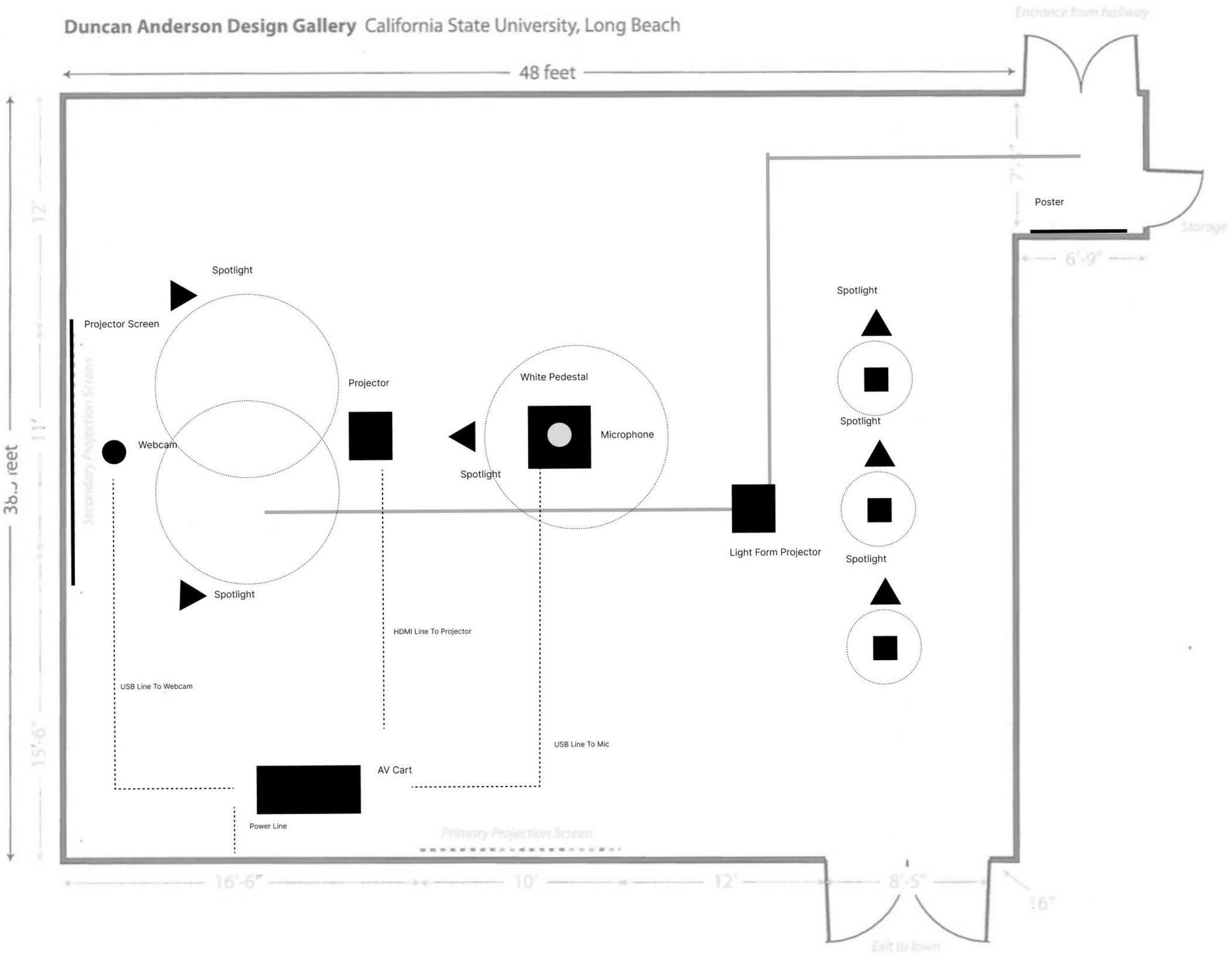


Exhibit Floor Plan and User Flow: Spatial layout of the Materealized installation at the Duncan Anderson Gallery, illustrating key interaction points, audience pathways, and the sequencing of the immersive experience.

DELIVER

05

MATEREALIZED FOR PUBLIC EXHIBITION

EXHIBITION

FEEDBACK

PUBLICITY & OUTREACH

FUTURE DEVELOPMENT

The Deliver phase marked the culmination of Materealized as a public-facing, immersive experience. This phase focused on transforming the system from a working prototype into an exhibit-ready installation—complete with narrative prompts, interactive visuals, and embodied storytelling interactions. It also included structured feedback collection to assess the emotional, cultural, and experiential impact of the system, and reflections on how the project could scale beyond the initial exhibit context.

05.01 EXHIBITION

THE EXHIBIT EXPERIENCE

Materealized was exhibited in a gallery setting, where guests were invited to share a memory using a microphone and memory slip, and then witness their story reimagined as a dynamic, point cloud-based visual environment. The space was arranged to support both active storytelling and passive observation. Projectors displayed the evolving visuals across a large wall.

MATEREALIZED

TRANSFORMING MEMORIES INTO A VISUAL EXPERIENCE

Born from witnessing the devastating impact of domicide - the destruction of homes - Materealized responds to the deep loss experienced by those displaced by conflicts, especially in the Middle East. Countless individuals are forced to abandon not just their houses but the memories and identities tied to them.

Using generative AI, Materealized reconstructs these fragmented memories into immersive visual experiences. By transforming personal recollections, it offers a space where displaced individuals can reconnect with pieces of their past that war and displacement have threatened to erase.

MA HXDI GABE GUTIERREZ

In the Materealized installation, participants share a memory by speaking into a microphone. As they describe their experience, the system listens and uses generative AI to create real-time visuals, bringing their words to life. These dynamic images unfold before their eyes, transforming spoken memories into vivid, immersive visuals that capture the essence of their story.

Guests interact with the visuals through movement. As they walk or gesture within the space, the imagery responds, shifting and evolving in real time. This interactive element shows how memories are fluid and change when shared, emphasizing the communal and ever-evolving nature of storytelling.

- WRITE OUT A MEMORY
- TELL YOUR STORY
- WATCH IT COME TO LIFE

Guests first encountered three pedestals displaying memory slips, along with a didactic introducing Materealized. This initial station provided instructions on what to expect and set the tone for the experience.

DUNCAN ANDERSON GALLERY EXHIBIT 12/02/24

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3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

MEM124

■ MATEREALIZED MEMORY SLIP

MATEREALIZED EXHIBIT 2024

INSTRUCTIONS

1. REFLECT ON THE PROMPT, RECALLING THE MEMORY IN VIVID DETAIL.

2. IN 2 SENTENCES DESCRIBE THE SIGHTS, SOUNDS, SMELLS, TASTES, AND FEELINGS OF THAT MOMENT AS YOU WRITE IT DOWN.

3. WHEN READY, WHISPER YOUR MEMORY INTO THE MIC TO BRING IT TO LIFE.

PROMPT THINK OF A TIME WHEN YOU EXPLORED A NEW PLACE. WHAT SURPRISED YOU? WHAT DID YOU NOTICE FIRST?

YOUR MEMORY

MEM025

Each memory slip featured a unique prompt, with short instructions to help guide guests in recounting their memories with vivid detail.

Guests took their memory slips to the microphone positioned at the center of the gallery, where they shared their stories aloud.

DUNCAN ANDERSON GALLERY EXHIBIT 12/02/24

As they spoke, their stories came to life on the projection screen.

Visitors watched each other’s stories come to life, as the storyteller became a performer—shaping what appeared on screen through the power of their words.

DUNCAN ANDERSON GALLERY EXHIBIT 12/02/24

Even without new input, the system continues to evolve dynamically—generating shifting visual interpretations of the last story and creating multiple versions over time.

05.02 FEEDBACK

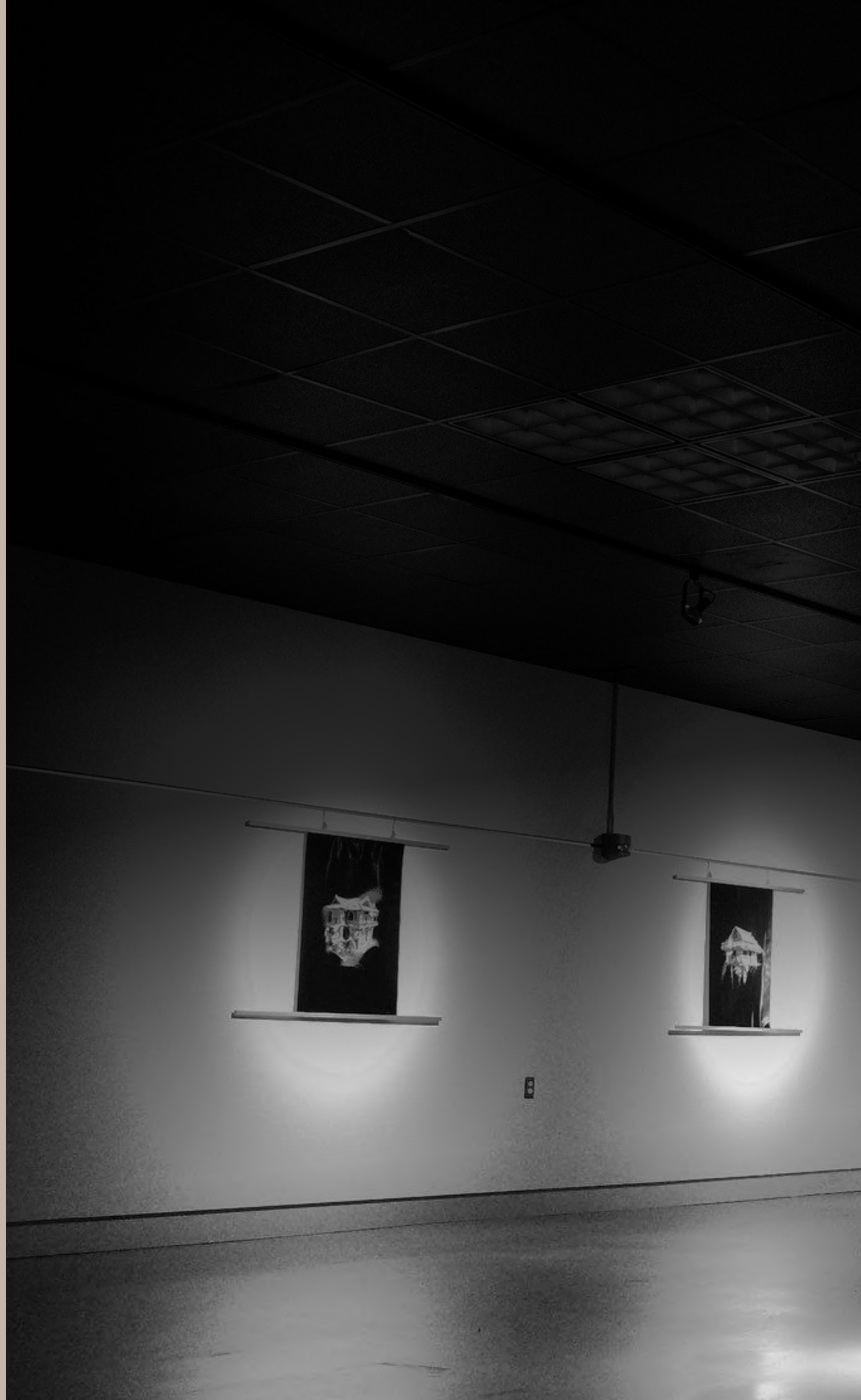
IMPROVEMENT OPPORTUNITIES

KEY TAKEAWAYS:

Participants valued the emotional and reflective nature of the experience.

Many expressed that the abstraction helped preserve the subjective truth of memory without imposing a “correct” visual.

Some participants requested smoother transitions and clearer visual-intent mapping, particularly during fast or layered visual changes.



SURVEY HIGHLIGHTS

- Memory Slips: Avg. rating 4.5/5 — most participants found them helpful in guiding story recall
- Ease of Story Selection: Avg. 4.3/5 — prompts made it easier to decide what to share
- Clarity of Visuals: Avg. 3.5/5 — some visuals lacked clarity, but abstraction was often praised
- Emotional Interpretation: Avg. 4.3/5 — abstract visuals encouraged personal interpretation
- Memory Reflection Impact: Avg. 4/5 — visuals enhanced participants' engagement with their memory

03.02 PUBLICITY & OUTREACH

PROMOTIONAL MATERIALS

To effectively promote the Materealized exhibition, I focused my marketing efforts on reaching key audiences, including committee members, fellow design students, and members of the broader academic and creative community. To streamline RSVPs and centralize event information, I created a personalized Partiful event link. This digital tool simplified event management, enabled real-time tracking of engagement, and helped ensure a strong turnout from my target audience.

In preparation for the exhibition, I also developed a suite of promotional materials, including poster assets, press release documents, and pitch decks. These materials were designed to communicate the project's purpose, emotional resonance, and technological innovation in a clear and compelling way. By combining digital outreach with professionally crafted promotional assets, I successfully connected the exhibition with its intended audience, fostering meaningful engagement and collecting valuable feedback for future iterations of the project.

Hi, I'm Gabe Gutierrez, the designer of Materealized.

I understand that many cultural institutions face the challenge of preserving and sharing the heritage of displaced communities, especially when physical artifacts are no longer available.

With Materealized, I use generative AI to transform personal stories—spoken or written—into immersive, visually rich experiences. This approach enables museums and archives to engage visitors more deeply, fostering empathy and understanding through authentic, story-driven encounters.

By incorporating Materealized, you can honor diverse cultural narratives and ensure that these vital histories continue to resonate for generations.

PRESS RELEASE & PITCH

MATEREALIZED

Where memories become bridges to our homeland.

...es into Immersive Experiences with AI

...preserve cultural heritage by ...ive visual experiences. ...e project bridges the gap ...connect with their roots

...nerates visuals ...mic platform ...es cultural ...ays

Materealized: Transforming Memories into Immersive Experiences with AI

Materealized leverages generative AI to preserve cultural heritage by transforming spoken memories into immersive visual experiences. Designed to combat cultural disconnection, the project bridges the gap for displaced communities, helping individuals reconnect with their roots through storytelling and technology.

Participants share their stories via voice input, and AI generates visuals in real-time, bringing intangible memories to life. This dynamic platform fosters emotional connections, preserves traditions, and makes cultural stories accessible to wider audiences.

"Materealized isn't just a storytelling tool—it's a bridge to our past," says Gabe Gutierrez, the project's creator and a Master's student at California State University, Long Beach.

The project culminates in an interactive exhibit showcasing the power of AI in cultural preservation, with plans for multilingual support and scalability to serve communities worldwide.

For more information, visit https://www.gabe-gutierrez.com/ma

MATEREALIZED

TRANSFORM YOUR MEMORIES INTO A VISUAL EXPERIENCE

AI MEETS HUMAN EXPERIENCE DESIGN

Materealized is an exhibit that showcases a realtime voice to image generation process as a cultural documentation tool. The project emerged to explore ways displaced people can build identity and community through documentation.

MATEREALIZED’S IMPACT

The exhibit successfully demonstrated the system’s ability to translate personal narratives into emotionally resonant, immersive experiences. It validated the potential of Materealized as a tool not only for personal reflection but for cultural education, empathy building, and intergenerational storytelling. By engaging users in the act of remembering through voice and witnessing those memories come alive in real time, Materealized offered a new model of digital cultural preservation that was active, embodied, and participatory.

WHAT'S NEXT

The promising results from the exhibit point to multiple opportunities for future development:

- Scalability: The system could be adapted for mobile or web-based interaction to reach broader audiences beyond gallery spaces.

- Multilingual Support: Integrating translation and regional language models would allow a wider range of diasporic communities to participate in their native languages.

- Deeper Community Collaboration: Partnering with cultural institutions, archives, and community centers could enable more intentional curation of memories and visuals.

- Expanded Visual Diversity: Training image models on more culturally specific datasets could improve the accuracy and richness of future visualizations.

NOTES

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my committee members—Michael LaForte, Alison Kowalski, Judith Samper, and Kyle Macabasco—for their invaluable guidance and unwavering support throughout this project. Your expertise, feedback, and encouragement were instrumental in shaping Materealized into what it has become.

A heartfelt thank you also goes to my incredible cohort members, whose collaboration and feedback were essential in bringing this vision to life. Special thanks to Shrey Patel for providing critical documentation support throughout the process, and to Divya Dhavala and Sofia Ingegno for their assistance during the outreach and promotional phases. I am deeply grateful to Maryann Dimatulac and Gileen Navarro for generously sharing their stories and insights during the prototyping stage, helping ground the project in lived experience.

This project would not have been possible without each of you. Your contributions, support, and belief in this work made Materealized a reality.

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HUMAN X MIDJOURNEY X CHATGPT

AI Image 1: A wide of bombs destroying villages and homes with people running , more smoke and bombs materializing as a Y2k futuristic point cloud aesthetic in the style of an illustration against a white background --ar 7:4

AI Image 2: A wide shot of 100 refugees standing looking straight at the camera materializing as a Y2k futuristic point cloud aesthetic in the style of an illustration against a white background

AI Image 3: Memories materealizing as someone sees food, photographs, and listening to music materializing as a Y2k futuristic point cloud aesthetic in the style of an illustration against a white background

AI Image 4: People's memories being triggered of india from eating food and photographs of their homeland materializing as a Y2k futuristic point cloud aesthetic in the style of an illustration against a white background

AI Image 5: Immersive technology used to bridge the gap between memories and fostering cultural preservation and a sense of belonging materializing as a Y2k futuristic point cloud aesthetic in the style of an illustration against a white background

AI Image 6: A full body of a 34 old Filipina communication strategist women hyper realistic against a white background

AI Image 7: Variation Image 6, women walking to the side

AI Image 8: Variation Image 6, women extreme closeup, profile side of women’s face

AI Image 9: A low fidelity pen ink sketch of a large public fun and playful interactive screen, with a person standing in front of it and they see a memory of their grandparents farming in the phillipines materializing as point clouds.

AI Image 10: A wide shot of a granddaughter and a grandparent looking at photos smiling in Philippines in the style of a three dimensional rendering of the scene materializing in a point cloud style against a black background void

AI Image 11: close up of people laughing and smiling buying things from the sari sari store in the Philippines in the style of a three dimensional rendering of the scene materializing in a point cloud style against a black background void

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