

Designing Resilient Memory Infrastructures for Ephemeral Public Memory in Volatile Digital Environments

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Abstract: The paper explores how digital memory infrastructures could be designed for ephemerality instead of perpetuity in unstable platform contexts. Through an emphasis on memes as fragile but culturally meaningful memory relics, the study proposes MEMESCAPE, a speculative interface that reconceptualises collective memory as a malleable ecology instead of a static repository. An interpretivist approach to qualitative design research was taken, where eight participants engaged in walkthroughs of the prototype. The results are based on extensive field notes and reflexive memos. The results demonstrate how metaphor-based interaction can slow people's typical platform use, highlight discourse as an aspect of memory creation, and even facilitate moral consideration of impermanence and memory management. Rather than arguing for preservation in the traditional sense, the paper advocates for resilient intelligence as a form of interpretation for navigating impermanence and infrastructural collapse in a more informed manner.

Keywords: Digital Heritage; Meme Culture; Public Memory; Resilient Intelligence; Speculative Design.

1. Introduction

Unlike a century ago, public memory in modern-day digital environments is increasingly shaped through fast-moving online interactions rather than by means of formal historical records alone. Memes, frequently relegated to the realm of humour or entertainment, constitute one of the most prominent examples of this transformation. Their circulation happens fast during moments of political tension, societal turmoil, and cultural shifts, bringing along collective emotions, criticism, satire, and public interpretation within highly condensed visual forms. During the 2024 Sri Lankan presidential election, memes served not only as entertainment but also as a dispersed means of resistance and public narrative. As one meme creator highlighted, "Memes reflect the socio-political dynamics and behaviours of our time... They document the key issues and opinions that influence political narratives."

Although memes constructively contribute to public discourse, they continue to be structurally fragile. Posts vanish with the deletion of accounts, changes in algorithms, collapses of platforms, or contextual shifts. Unlike newspapers, institutional archives, or official records, memes rarely leave stable historical traces. A participant reflected on this by noting, "Some news was seen in memes before it was ever on TV. But they disappeared... No place keeps them." In this regard, the issue lies not simply in the loss of media content but in the lack of proper infrastructure for supporting such forms of public memory.

Most of the contemporary platforms for digital preservation today are designed around stability, classification, and institutional authority, whereas memetic culture thrives on mutation, remixing,

participation, and fluidity of context across platforms and communities, with their meanings shifting depending on context and participation. Due to this, traditional archival models struggle to cope with artefacts that are generally short-lived, spread out, and composed by multiple individuals.

This study emerges from a significant challenge brought up by that tension: how might we design digital memory systems that can accommodate volatility rather than resist it? In order to address this issue, the article brings forth the idea of resilient intelligence. In this study, resilient intelligence is introduced as a design fundamental and interpretive framework for creating adaptive memory systems that can adapt and respond to transformation, decay, and uncertainty. Resilient intelligence does not refer to artificial intelligence or automated computation. Rather, it refers to the ability of a digital memory system to become culturally responsive amid change and participation.

On this basis, the study conceptualises memory infrastructures as the socio-technical systems through which societies store, circulate, and interpret their public memory. Such infrastructures can never be neutral and always affect what is to become visible, forgotten, or historically legitimate. Similarly, the paper employs the term 'volatile digital environments' to refer to the rapidly evolving world of social media, which can be seen as being characterised by algorithmic instability, accelerated content circulation, and platform dependence. In such volatile settings, perhaps permanence should not be viewed as the optimal mode of digital preservation.

In this effort, the study introduces MEMESCAPE, a theoretical, practice-orientated design intervention that redefines digital public memory as an adaptive ecological system. One that is dynamic and adaptable to change. Instead of treating memes as static files in a repository, MEMESCAPE interprets them as dynamic entities that exist in a dynamic spatial environment. Here, static memes behave as rooted forms, branching and expanding; GIFs loop continuously as circulating flows, and video memes evolve across temporal layers. Users are not just passive content consumers. They are active participants who wander, plant, interpret, and negotiate forgetting. Memory ecology in this case would be defined by an ecosystem in which growth, decay, participation, and mutation are all equally part of cultural continuity.

This study is originating from a Global South perspective, which is characterised by an underdeveloped digital infrastructure for preserving digital media and where participatory media acts as an alternative form of civic memory. Thus, the research aims at bridging the crucial gap between existing institutional preservation infrastructures and the current unstable conditions of digital cultures.

In relation to the above, there are three major research questions that guide the work:

Primary Research Question:

How can resilient intelligence be designed into digital memory infrastructures to sustain ephemeral public memory within volatile digital environments?

Secondary Research Question:

How do speculative, metaphor-driven interaction models reshape user engagement with the lifecycle of memetic artefacts, including growth, mutation, and decay?

Tertiary Research Question:

What cultural, ethical, and infrastructural implications arise from the transformation of public memory from static archival storage to resilient systems, particularly in postcolonial digital contexts?

The contribution of this work is the development of a design-orientated framework that explores how digital memory can be understood beyond permanence through the use of speculative prototyping, participatory walkthroughs, and thematic analysis. It reframes memes not as ephemeral internet content but as culturally design-orientated, evolving forms of public memory which need more adaptive and resilient approaches to preservation.

2. Literature Review

The question of how societies remember has conventionally been linked to infrastructures of stability. Historically, the archives, libraries, and institutional

repositories were meant to stabilise memories through the classification, gathering, and preservation of artefacts for a considerable amount of time. But scholars such as Arjun Appadurai (1996) and Tuhiwai Smith (2012) have argued that these archives are inherently political, deciding what should be preserved and remembered while what should remain invisible and forgotten. The fragmentation of public memories in postcolonial nations has been largely due to the inequitable distribution of preservation technologies.

What makes this phenomenon complicated, however, is the nature of digital media environments. While conventional media archives seek permanence, digital ecosystems function through filtration algorithms and circulation. This contradiction has been explained as "enduring ephemerality" by Chun (2011), which refers to the permanence achieved by the endless reproducibility of digital content while at the same time being highly susceptible to deletion, algorithmic invisibility, or context loss. The memory of the public is no longer contained within institutional archives but within networked environments regulated by proprietary logics.

It is in this dynamic landscape that memes have emerged as dense bearers of vernacular knowledge. Despite being commonly viewed as ephemeral entertainment, memes have been recognised by scholars as a form of condensed public discourse and emotional expression. Shifman (2013) describes memes as cultural units of participation that gain meaning through reproduction and modification. Similarly, Jenkins (2009) locates memes in the context of participatory culture that enables audiences to transform from passive recipients of culture into active creators of cultural narratives. In this sense, memes are not standalone jokes but socially negotiated cultural signals.

It is during moments of political tension, crisis, or social transformation that the relationship between meme culture and public memory becomes more obvious. Research on South Asian digital cultures (for example, Arora, 2019; Lokuge & Wijeratne, 2022) illustrates the ways in which humour, satire, and remix act as forms of dissent and civic storytelling in contexts of instability. In these contexts, memes serve as vernacular memory artefacts, and their significance does not reside solely within the visual representation itself but also extends to the surrounding discourse, such as comments, reposts, and reinterpretations of them.

Memory studies provide more support to the relationship between memes and collective memory. As Halbwachs (1992) notes, memory is constructed socially using shared frameworks and not as an individual storage place. Similarly, according to Assmann (2011), cultural memory is formed from the circulation and reinterpretation of symbols within society. Memes align well with both theories, since their creation relies on community

understanding, shared references, and constant reinterpretations. The meaning of memes is not determined by the creation process. Rather, it comes through the collective experience and negotiation of the memes' audience members.

Nonetheless, memetic culture also reveals a major infrastructural challenge. Even though memes inspire participation on a large scale, the platform on which they exist is incapable of maintaining contextual significance. Berger and Luckmann's (2016) concept of the social construction of reality illuminates the process of meaning creation through symbolic interaction. Without being anchored in any specific cultural, political, or emotional context, memes easily become meaningless. This problem is further exacerbated by disinformation scholarship (Wardle & Derakhshan, 2017; Meese et al., 2021), which stresses the ethical implications of decontextualised dissemination. Baudrillard's hyperreality theory amplifies the scenario by proposing that mediated products actively construct and distort political reality rather than merely representing it. In such spaces, the destruction of contextual memory exerts a negative impact on collective perception.

The tensions outlined above have increasingly been acknowledged in digital heritage studies. Community archives and memory models (Flinn, 2007; Huvila, 2008) involve a paradigm shift by positioning users as participants in the creation of memory systems, rather than passive recipients of archival efforts. However, many such systems still emphasise storage and retrieval, retaining artefacts irrespective of the system's adaptive intelligence itself and often treating memory as static content rather than as an evolving process. The notion of resilience, drawn from ecological and systems theory, provides an alternate perspective: resilience illustrates the potential for systems to cope with perturbation, reorganise, and continue functioning without collapsing into erasure.

It is in relation to such shortcomings that this study sits. Utilising ecological resilience theory, speculative design, and participatory memory systems, this research proposes the theoretical framework of resilient intelligence in digital memory infrastructures. In this research, resilient intelligence would be defined as the principle that allows memory infrastructure systems to be able to adapt, reconfigure, and maintain meaning in the face of instabilities, mutations, and deterioration. Instead of resisting volatility, resilient systems acknowledge ephemerality as part of how digital public memory naturally evolves.

This is examined via the development of MEMESCAPE, a speculative interface prototype that reimagines memes as dynamic ecological entities within a navigable memory environment. This study, which is at the convergence of digital heritage, participatory media, and speculative

design, fills a gap in the existing literature by combining metaphor-driven interaction with participatory exploration to explore how ephemeral meme cultures can function as evolving forms of collective memory rather than just disposable digital entertainment, proposing the notion of resilient intelligence within digital memory infrastructures. The objective is not to petrify memetic culture into a rigid archival structure but to create dynamic systems that are capable of sustaining contextual integrity, especially in digital environments where public memory is both vulnerable and politically significant.

3. Research Design and Methodology

3.1. RESEARCH FRAMING: RESILIENT INTELLIGENCE AS DESIGN INQUIRY

This study analyses resilient intelligence as a human-interface capacity: the capacity of remaining interpretively flexible, emotionally reflective, and ethically responsive when digital memory evolves form, loses context, or deteriorates, as opposed to approaching resilience as technical robustness or intelligence as algorithmic optimisation. The term is akin to media and platform literacy. Resilient intelligence is more specific in one way and more general in another. It is wider since it incorporates ethical and emotive orientation in addition to critical interpretation, but it is narrower because it is based on mnemonic engagement.

In this research, the aim is to examine how design can generate conditions in which interpretive resilience with regard to ephemerality is achieved and which turn digital volatility into a structural issue requiring reflective literacy rather than being a problem of permanence. Thus, resilience does not entail discernment, while intelligence entails relational comprehension over time rather than computation.

This research methodology draws from speculative design research; as such, it positions design as an epistemic agent, drawing on the epistemology of critical design (Dunne & Raby, 2013) as well as relational ethics in participatory design (Light & Akama, 2014). MEMESCAPE, the mid-fidelity interface prototype, serves as a symbolic inquiry tool to investigate users' emotive and cognitive interactions with unstable digital memory corpuses. Instead of merely boosting meme circulation, the aim is to interrogate how memes become part of or disappear from collective memory.

3.2 EPISTEMOLOGICAL POSITION

This study employs a qualitative interpretivist epistemology, observing digital artefacts not as objective data points but as pieces of cultural memory. It understands knowledge as something that is generated through interaction, symbolic interpretation, and reflexive dialogue. Thus, the prototype does not function as something to be tested for usability but as something

through which participants are able to express their understanding of temporality, transformation, and ethical forgetting. The speculative prototype serves as a cognitive provocation device. It is an artefact intentionally designed to disrupt users' accustomed scroll-based consumption. By spatialising meme lifecycles as natural events (growth, mutation, decay, and sedimentation), the interface compels users to re-evaluate temporality, authorship, and ethical forgetting. Here, design is evaluated in the following ways for its capacity to surface interpretive tensions rather than usability efficiency:

- What constitutes memory in a platform-driven environment?
- When does repetition become distortion?
- How should digital artefacts be allowed to die?

This epistemological stance is consistent with feminist and decolonial design methodologies, which reject neutrality and emphasise designer positionality as a component of knowledge production.

3.3. METHODOLOGICAL STRUCTURE

The methodology retains two interrelated components: speculative interface prototyping and guided interpretive engagement.

3.3.1 Speculative Interface Prototyping

MEMESCAPE was created as a mid-fidelity, metaphor-based interactive system using Figma and motion simulations. The system transforms meme types (static, GIF, video) into ecological entities in a navigable "forest" space. Instead of a linear flow, the interface uses non-linear spatial reasoning, sentiment mapping, and temporal mapping for demonstrating the build-up, evolution, or degradation of digital objects.

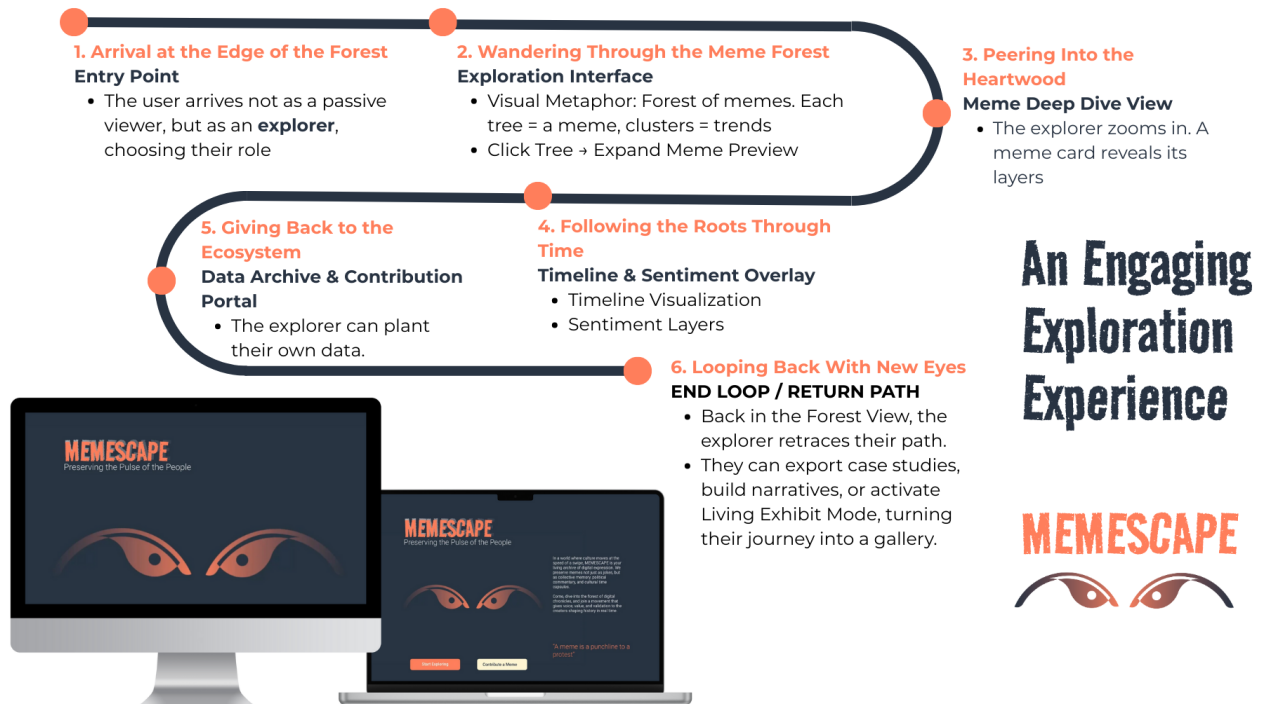


Figure 1: Mid-fidelity prototype of *MEMESCAPE*
(Source: Author)

This design embodies the idea of resilient intelligence by encouraging users to roam rather than scroll, to dwell rather than react (Figure 1). It deliberately avoids metrics, notifications, and optimisation, thereby decoupling engagement from platform reward structures.

The prototype is a controlled volatility simulator that puts participants in unstable conditions while presenting it as terrain to be navigated.

3.3.2 Participant Sampling and Interpretive Sessions

As demonstrated in the table (Table 1) below, the author, to guarantee diversity in interpretative literacies, rather than statistical representation, recruited eight participants (N=8) through the method of purposive sampling. The sample includes meme creators, communication designers, digital media users, and a cultural critic, selected as each has unique ways of relating to digital culture, public discourse, and visual interpretation. Meme creators provided information about meme-making and

humour in politics; communication designers discussed the literacy and interface of memes; digital media users gave perspectives on their everyday use of online media;

and the cultural critic commented on satire and public memory.

Table 1: Participant Overview
(Source: Author)

Participant Role	Age Range	Gender	Recruitment Route	Inclusion Criteria
Meme Creator (x3)	20–30	Male	Instagram DM, Facebook pages	Active meme creation and familiarity with political humour
Communication Designers (x2)	22–28	Male and Female	University networks	Design literacy; ability to interpret speculative interfaces
Digital Media Users (x2)	18–35	Male	Personal networks	Regular meme consumers with varied digital literacy
Cultural Critic (x1)	30–40	Female	Professional contact	Knowledge of digital satire and public discourse

The sample is relatively small in relation to exploratory speculative design research, whereby depth of interpretation and reflection take precedence over generalisation of results on a grand scale. Participant selection was conducted until recurring motifs involving memory, deterioration, participation, and metaphorical interpretation started to emerge across sessions.

Each study session followed an organised walkthrough protocol, which lasted for 30 to 45 minutes. Following a brief contextual lecture, participants were free to experiment with the prototype (Figure 2).



Figure 2: Testing the low-fidelity wireframes with a cultural critic
(Source: Author)

In order to prevent the method from over-scripting emotive pacing, think-aloud articulation remained optional. The sessions concluded with reflexive dialogue centred on three axes:

1. Perception of digital temporality
2. Emotional response to mediated decay
3. Ethical stance toward remembering and forgetting

To maintain participant convenience and relational immediacy during an exploratory interaction, neither screen nor audio recordings were made. Instead, the results are recorded through rich notes of the sessions, where changes of interpretation and reflection are noted. This approach to the sessions reinforced the immediacy of the encounter but also reduced the level of granularity for the analysis of the results. Hence, the results should be taken as interpretative.

3.4 DATA ANALYSIS: TRACING RESILIENCE PATTERNS

The study categorised field notes and introspective memoranda for signs of resilient intelligence using Braun and Clarke's (2006) six-phase thematic analysis.

After reading the initial notes multiple times, descriptive codes were created throughout the sessions and integrated into a more manageable set of analytical patterns. Although codes are always receptive to emerging themes, four codes were developed as indicators of resilient intelligence.

- Recognising non-linearity through temporal reframing
- Emotional deceleration (pause, reflection)
- Ethical articulation (acknowledgment of ethical responsibility in memory/erasing)
- Transfer of metaphor (from interface metaphor to practical criticism)

The analysis was not designed to produce consensus and frequency. It tracked recurrent cognitive reorientation patterns throughout the sessions. Resilience was demonstrated by individuals exhibiting ambiguity, changing their initial beliefs, or expressing moral conflicts between disappearance and preservation rather than by

agreement. These patterns are offered as analytically suggestive rather than definite, according to the limited sample size and the absence of recordings.

3.5 REFLEXIVITY AND RESEARCHER POSITIONALITY

The researcher, as both designer and facilitator, holds a dual role as constructor of volatility and interpreter of response. A parallel visual-analytic journal was maintained throughout development and testing, documenting symbolic decisions, unconscious biases, and affective reactions.

Rather than masking subjectivity, this reflexive layer acknowledges that resilient intelligence must also be cultivated within the designer because the system's provocations are inseparable from the author's own negotiation with digital memory.

3.6 ETHICAL ORIENTATION

Prior to involvement, informed consent was acquired, and all participation was anonymous. The methodology focuses on what it refers to as ethical forgetting, which is the awareness that resilience may involve allowing these artefacts to deteriorate.

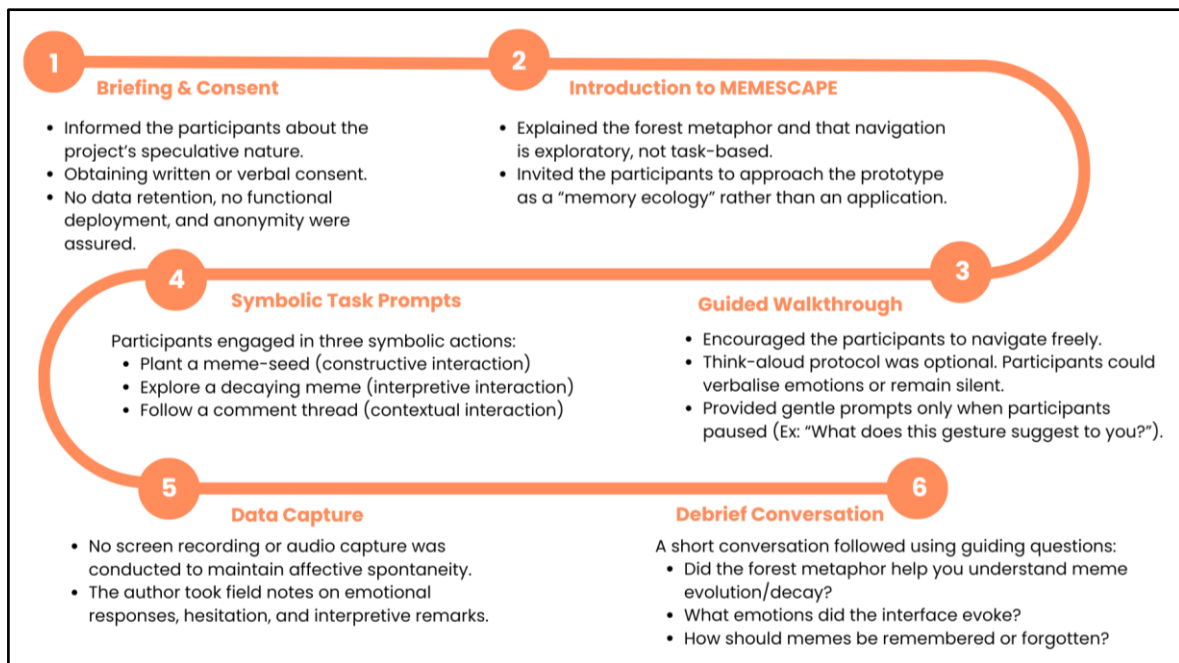


Figure 3: Step-by-Step Protocol
(Source: Author)

The methodology, as depicted in Figure 3 above, recasts memory as a form of stewardship rather than accumulation. It perceives design as a mediator between volatility and care, not stabilising the digital environment but empowering human capabilities to navigate that environment critically.

4. Analysis: Designing Resilient Intelligence within Ephemeral Public Memory

The methodological problem focused on staging volatility, whereas the analytical problem questions whether

MEMESCAPE effectively builds resilience in understanding fleeting public memories. This section delivers findings from the thematic analysis of field notes, participant responses, and researcher memos acquired over the walkthrough sessions. The data were analysed using Braun and Clarke's (2006) thematic analysis approach. Recurring patterns were identified in how participants interpreted events, emotions, and reflections on remembering and forgetting. The analysis's focus wasn't on assessing usability or establishing generalisable claims about behaviour but rather on investigating how participants understood MEMESCAPE as a speculative memory space.

Thus, the results are meant to be interpreted as interpretive and exploratory, as they do not demonstrate the effectiveness of a deployable system but demonstrate how metaphor-led interaction might promote alternative methods of contemplating digital memory and public participation instead.

4.1 FROM ARCHIVE TO ADAPTIVE MEMORY ECOLOGY

One of the strongest patterns that emerged throughout the walkthrough sessions was a shift in how participants viewed digital memory. Participants often did not refer to MEMESCAPE as an archive but referred to it as a landscape, ecosystem or memory space. This shift implies that the ecological metaphor assisted participants in challenging conventional assumptions of archives as fixed repositories.

Traditional forms of digital archives are based on accumulation, indexical control, and taxonomic permanence. In this regard, the MEMESCAPE intentionally does not function like a traditional archive. It does not store to preserve but to spatialise and reveal instability.

In this way, it changes the paradigm of preservation to adaptation. Memes are not static objects but rather temporal agents in an ever-changing discourse environment. Their emergence, mutation, and decay are no longer errors to correct but rather conditions to understand. Several participants interpreted growth, decay, and transformation as natural aspects of public memory and not as info getting lost.

These reactions indicate that the prototype made them view memory as a dynamic process, not just a static archive. Instead of dwelling mainly on where information was maintained, participants often expressed their thoughts on the manner in which meaning evolves as cultural contexts transform. This interpretive reframing is in line with the study's concept of resilient intelligence: the capacity to comprehend, navigate, and respond to change, not just preserve stability.

4.2 VOLATILITY AS DESIGNED CONDITION

A second theme centred on how participants dealt with uncertainty and change in the interface. With intentional visual signs of instability, such as transformation and decay, MEMESCAPE's design aimed at showcasing volatility rather than hiding it.

From field notes, researchers noticed participants pausing frequently when faced with shifting meme structures or evolving discourse layers. These pauses often coincided with questions or reflections regarding why certain content had changed. The study does not provide confirmation that the prototype changed user behaviour in an objective sense, but participants' responses indicate that the design encouraged less rapid and more contemplative engagement, unlike their typical speedy browsing on social media. Cognitive slowdown, a crucial indicator of robust intelligence, is illustrated by such pauses.

What is noteworthy here is that several participants reflected on recognising the transformation itself, not just the consumption of content. This outcome is crucial since it implies that volatility can be framed as an attribute to be interpreted, as opposed to something to be resisted. Instead of viewing change as a problem to fix, participants viewed it as an integral part of meaning-making. This approach shows that volatility could be interpreted and embraced, not dodged.

4.3 MEME FORMS AS TEMPORAL ORGANISMS

The biological behaviours attributed to static memes, GIFs, and videos operate analogically as models of differential temporality.

- Static memes (trees) present as grounded and monumental but frail in their saturation. Their bark-like layers of metadata reveal historical sedimentation. They illustrate the manner in which repetition hardens ideology.
- GIFs (water bodies) loop endlessly, referencing emotional contagion and memetic recursion. Their continuity stresses cyclical effects as opposed to narrative progression.
- Videos (mutating creatures) evolve evidently in response to exposure and remixing, making transformation more apparent than in updates to the platforms.

These distinct behaviours are intended to shape perception. The user becomes aware that not all digital objects age evenly. Some become calcified; some successfully circulate; and some mutate beyond recognition.

Resilient intelligence, in this context, involves recognising form-specific vulnerability: understanding which artefacts demand critical scrutiny, which invite ironic detachment, and which require ethical intervention.

4.4 THE DISCOURSE SEDIMENT LAYER

The importance of public discourse about memes was another recurring theme. Participants frequently remarked that comments, reactions, and reposts helped them comprehend why a meme mattered within a particular social or political context. Instead of algorithmically summarising or sentiment-scoring just one meaning, MEMESCAPE demonstrated multiple layers of conversation, which enabled participants to see how meanings evolve through collective participation. This is a crucial element of this model for resilient intelligence, as it rejects the idea of outsourcing interpretation to some kind of "algorithmic authority".

In environments where discourse is abruptly decontextualised, this model provides a sense of historical depth. It indicates the fact that public memory is not about the original artefact but about the competing narratives surrounding it. This observation is in line with existing scholarship on collective memory, which argues that meaning is constructed through social interaction and ongoing reinterpretation, rather than by artefacts alone. Thus, public memory exists both in the meme and in the discourse around it.

4.5 INTERACTION AS ETHICAL GESTURE

Mnemonic responsibility is practised through the figurative actions of planting, tracking evolution, tracing speech, and permitting disintegration.

The act of "planting a meme-seed" is not simply the act of uploading a contribution, as it is also the act of submitting to being changed beyond one's control. The user observes their contribution integrating, distorting, or disappearing. Collective authorship is emphasised while ownership notions are undermined by this experiential loss.

The potential for degradation without recovery also raises the notion of ethical forgetting. Not all artefacts are preserved indefinitely, as some are subject to collapse and become compost for feeding future growth. This is an intentional design choice that resists the extractive culture of total retention that is characteristic of much of contemporary online culture.

Consequently, resilient intelligence implies understanding that forgetting can be just as deliberate as remembering and accepting impermanence without becoming apathetic.

4.6 RECONFIGURING THE USER: FROM CONSUMER TO MEMORY AGENT

The traditional interface situates the user as a 'scroller' in an optimised attention economy. MEMESCAPE situates the user as an 'explorer' in a fluid cultural landscape.

The user navigates without breadcrumbs or tutorials; their

navigation is a function of their intuition and interpretation of risk. Several participants experienced an adjustment period that mirrored adaptation to volatile systems, beginning with disorientation and progressing to gradual orienting. This pattern is significant due to resilience in this context, referring to iterative recalibration, or the gradual formation of meaning in a setting that rejects typical platform cues, rather than instant mastery.

This transition is analytically noteworthy because resilience is accomplished by periodic recalibration rather than immediate mastery. By refusing efficiency, the interface fosters tolerance for ambiguity. Users need to develop their own pathways, which demonstrates epistemic autonomy as opposed to algorithmic dependence.

The user's identity as an explorer also promotes a different form of spectatorship. They are gardeners, spectators, and sometimes mourners. Their feelings of guilt in relation to a garden run wild, fascination with mutation, and distress at deterioration suggest affective engagement with a process of collective memory as a process in lieu of a static entity.

4.7 COGNITIVE FRICTION AS PEDAGOGICAL STRATEGY

The absence of metrics, trends, or completion in MEMESCAPE's design defies typical UX design patterns and creates friction.

While friction in dynamic digital environments is generally reduced to facilitate user engagement, it serves as a teaching tool here. The use of spatial dislocation and non-linear return creates disorienting navigation.

One participant described the interface as "visually tender but emotionally sharp". Such ambivalence signals reflective activation. Confusion is not failure; it is cognitive reorientation.

The interface exposes the constructed nature of digital memory systems by subverting user expectations of immediacy and agency. Users are made to question not only MEMESCAPE but also the feed-based architectures they have become accustomed to.

4.8 TOWARD RESILIENT INTELLIGENCE IN PUBLIC MEMORY

The cumulative effect of all these interventions is that MEMESCAPE is not simulating resilience in terms of technological robustness. Rather, it is simulating a set of conditions in which resilience can be interpreted.

The most obvious patterns that emerged across all sessions were the following:

- Increased understanding of meme temporality transcending virality cycles.
- Recognition of the discursive constitution of memory, instead of discursive commentary.
- Acceptance of degradation as structural and not accidental.
- Heightened sensitivity to their own involvement in triggering or enabling disappearance.

In unpredictable cyberspaces where speed frequently trumps reflection, resilient intelligence is defined as being capable of slowing down, contextualise and ethically orienting oneself within flows of cultural creation.

Therefore, MEMESCAPE serves as a speculative learning environment as opposed to a standard living archive. It stages volatility in order to render it thinkable. It redefines ephemerality as a condition but not an imminent threat.

This model does not secure or cede public memory. It is fostered and constantly negotiated between growth and decay and remembrance and forgetting. Design here demonstrates users recognising its patterns in lieu of alleviating the storm.

5. Findings and Discussion: Cultivating Resilient Intelligence in Volatile Digital Memory Ecologies

This section summarises the main themes that arose from the walkthroughs before heading on to more general consequences in Section 5.7. The shift in analysis is from understanding the value of MEMESCAPE as an inclusive archive to one that is speculative in the development of resilient intelligence in unstable digital memory environments.

The six interrelated themes that came out of the eight interpretive walkthroughs can be summarised as follows (Table 2), which show the possibilities of designing for cognitive and ethical resilience in volatile public memory formations while underscoring the limitations of the small-scale exploratory nature of the research.

5.1 FROM EXPLORATORY ENGAGEMENT TO ADAPTIVE ORIENTATION

Table 2: Themes Overview of User Engagement with MEMESCAPE
(Source: Author)

Theme	Definition	Representative Quote (Anonymised)	Design Implication/s
1. Exploratory Engagement	Users become active explorers (not passive viewers), treating MEMESCAPE as a navigable memory ecosystem rather than a tool.	<i>"It felt more like a place to walk through, not a page I had to use."</i> (P3)	Supports exploration-based navigation and non-linear pathways as the core interaction logic of MEMESCAPE.
2. Emotional Tension	Affective cues (colours, pacing, micro-animations) build intentional emotional ambiguity that slows users down.	<i>"The interface wasn't nudging me to do anything. It just invited me to feel something."</i> (P1)	Affirms the use of mood as a method. It validates tension as a cognitive disruptor rather than a mere UX flaw.
3. Symbolic Interaction & Meaning-Making	Users interpret memes as evolving cultural signs shaped by social-political contexts and communal knowledge.	<i>"Through those memes, I was seeing how people talk to each other through them."</i> (P6)	Strengthens emphasis on comment threads, contextual layering, and user-driven planting to represent discursive depth.
4. Metaphor as Cognitive Frame	The forest metaphor allows users to understand and interpret memory as dynamic, ecological processes.	<i>"It was more like a memory forest than just an archive."</i> (P4)	Validates metaphor as structure while strengthening ecological interactions (growth, decay, evolution).

5. Productive Disorientation	Lack of conventional UI cues induces initial friction that leads to reflective engagement.	<i>"Not knowing what to do made me stop aimless scrolling and think. Like it was slowing me down on purpose."</i> (P2)	Confirms that UI minimalism and refusal of efficiency induce disorientation, which becomes pedagogical.
6. Ethical Ambiguity & Responsible Forgetting	Users confront ambiguities around preservation, decay, and the politics of forgetting.	<i>"It felt like a moral choice...deciding whether to keep it or let it rot."</i> (P5)	Strengthens decay as an ethical gesture and supports the design of selective forgetting mechanisms.

Over a series of sessions, participants regarded their experience of entering MEMESCAPE as an exploratory one and not as an instrumental experience. The absence of task-driven suggestions switched them from passive consumers to proactive navigators. This alteration is analytically significant because it reveals an adaptive recalibration of what it means to approach a digital environment when reward-based cues are absent.

In an unstable digital environment, algorithmic feeds are ubiquitous. Reward-based navigation is a common experience. MEMESCAPE intervened in this pattern. Users mentioned "walking through" as opposed to "using" the interface.

This form of spatial thinking promotes resilient intelligence by encouraging adaptive orientation. As opposed to relying on ranking or trending markers, users devised their own interpretive tactics, such as following visual cues, tracing discourse layers, and revisiting decayed artefacts. Here, resilience manifests as navigational autonomy: the ability to construct meaning without algorithmic scaffolding.

5.2 EMOTIONAL TENSION AS COGNITIVE INFRASTRUCTURE

One of the patterns that emerged in the field notes is the emotional tension achieved by pacing, micro-animations, pneumatic (sounds), and non-linear transitions. While participants did not always find this enjoyable, several did recognise that this tension was an intentional and productive aspect of interpretation.

In fragile digital ecosystems, emotional responses are frequently magnified to increase interaction. By contrast, MEMESCAPE counters this by modulating the escalation of emotional response. Several participants mentioned a sense of "being held in a mood" compared to being urged to action.

This deceleration is important because it created a cognitive infrastructure in the form of emotional tension, causing participants to dwell on the artefacts instead of

dismissing them outright. One participant noted that the interface "wasn't nudging me to do anything. It was asking me to stay."

This dwelling on emotional response is a key component in the creation of resilient intelligence because it counters the pattern of reactive consumption and, instead, creates a space for interpretation. Thus, emotional tension, in this case, serves as interpretative depth.

5.3 SYMBOLIC INTERACTION AS DISCURSIVE LITERACY

Over the course of all sessions, participants demonstrated heightened awareness of memes as evolving socio-political signs and not as isolated images. They explored how public memory is socially negotiated as opposed to retained intact using discourse sediment layers such as comment trails and derivative artefacts.

What was important was that this process was not disembedded. Participants were able to conceive of how the tone of a meme was negotiated over time, how irony was translated into ideology, or how humour was used to obscure political allegiance.

This process of interpretation can be seen to be one of emerging discursive literacy, which forms part of resilient intelligence. In uncertain circumstances wherein decontextualisation is widespread, being capable of recreating discursive lineage is critical.

Rather than taking memetic meaning at face value, participants were able to conceive of its trajectory. The layered form of MEMESCAPE enabled participants to conceive of memory not in terms of singular authorship but rather communal sedimentation.

5.4 METAPHOR AS COGNITIVE REFRAMING OF VOLATILITY

The forest metaphor was found to be important in terms of epistemology, more than a mere garnish. Participants were found to use linguistic forms to consistently describe MEMESCAPE in ecological rather than database terms.

This linguistic shift is significant since it indicates that metaphor helped redefine volatility as structural rather than incidental.

In typical interfaces, absence or disappearance was found to be interpreted in terms of loss or failure. Within MEMESCAPE's metaphorical framework, decay was found to be understandable and even necessary in terms of merging or decaying artefacts. Users identified that certain artefacts should merge or dissolve.

Metaphor thus served as resilience technology. It transformed abstract volatility into an embodied process, permitting participants to acknowledge impermanence without disengagement.

5.5 PRODUCTIVE DISORIENTATION AND HABIT DEPROGRAMMING

Initial confusion was the norm, though not universal. The absence of linear hierarchy was disorienting for entrenched interaction styles. Yet in some cases, this disorientation was leveraged productively, as frustration gave way to reflection on the recognition that the interface design intentionally forgoes efficiency.

Participants noted a transition from aggravation to introspection. As one participant highlighted: "Not knowing what to do made me realise that maybe I don't always need to know."

This moment of reflection was the deprogramming of platform-conditioned reflexes. In the dynamic environment of digital platforms, the priority is often the clear and efficient use of time to sustain user engagement. MEMESCAPE, on the other hand, rejected ambiguity as an instrument for learning.

In this context, resilient intelligence entails the capacity to endure ambiguity. The users learnt to remain in the space of interpretive uncertainty without falling into the reflex of exit and dismissal. The interface's forgoing of efficiency provided an opportunity to reconsider typical digital behaviours.

5.6 ETHICAL AMBIGUITY AND RESPONSIBLE FORGETTING

Possibly, the most significant discovery, however, was the way the participants responded to the possibility of decay and selective forgetting. The threat that the meme would "rot" rather than be preserved indefinitely led the participants to ponder the issue from a moral perspective and, in some cases, feel uneasy about the notion of preservation itself.

The participants were able to articulate questions that were rarely posed in the context of mainstream platforms, such as the following:

- Should this artefact persist?
- Does the act of preservation itself amplify harm?
- What does it mean to let a cultural fragment disappear?

One participant referred to degradation as "a moral choice". Another participant also offered the following response to the issue of forgetting, associating forgetting with personal growth: "It's letting go of a version of me." These remarks exhibit the development of ethical reflexivity, a cornerstone of resilient intelligence. As opposed to viewing memory as neutral storage, participants acknowledged its political and affective implications.

In unstable contexts where information is recycled infinitely, the deliberate degradation of information becomes a form of stewardship. MEMESCAPE underscores this contradiction by converting memory from passive loss to a responsible gesture.

5.7 DISCUSSION AND IMPLICATIONS: DESIGNING FOR RESILIENT INTELLIGENCE

The results of this study imply that resilient intelligence is capable of being created via deliberate design interventions that slow down interpretation, visualise discourse, and make deterioration ethically legible. The results also provide a better understanding of the paper's theoretical contribution. In keeping with the study of memes as participatory cultural units (Shifman, 2013), platformed ephemerality (Chun, 2011), and community-orientated memory work (Flinn, 2007; Whitelaw, 2015), MEMESCAPE proposes that public memory is dependent on interpretive access to context, transformation, and loss and, not just storage.

- Design principle 1 – Disrupt feed-first navigation: Eliminate or de-emphasise trending metrics and chronological feeds, requiring users to generate meaning through exploration (helps users develop adaptive orientation).
- Design principle 2 – Apply 'productivity friction' to slow users' interpretation. Create times of doubt (e.g., confusing paths) that promote reflection instead of reactivity (emotional-cognitive control).
- Design principle 3 – Make context and contestation prominent: Present comment lineage and remix branches to allow users to track how meanings diverge across publics (supports discursive literacy).
- Design principle 4 – Approach degradation as an ethical interaction, not just a system failure. Provide explicit channels for fading, contextual archiving, or withholding amplification, together with evident reflection prompts (aids users in developing ethical reflexivity skills).

It is noteworthy that resilient intelligence is not the same as general media literacy. As deployed here, the term refers to the capacity for interpretation, contextualization, and ethical placement of oneself in unstable mnemonic systems.

Finally, MEMESCAPE also makes an important methodological contribution. It demonstrates the possibility of speculative design as a method for making hesitation and ethicality available for study, which may not have been possible through other means, such as interviews or surveys. However, the limited sample and documentation choices also suggest that the results must be regarded as tentative.

In the fluid world of the digital, public memory will continue to be precarious. The question, thus, is not how to make it stable once more, but rather how to make the participants, the designers, and the institutions better able to live with instability in a more responsible way. As a pedagogical interface that incorporates metaphor, symbolic interaction, emotional friction, and ethical ambiguity, MEMESCAPE serves as a speculative tool. It is not designed to retain everything, nor is it designed to make the complex simple.

In contrast, it fosters the ability to remain mindful in the midst of flux, to remember selectively, to forget responsibly, and also to comprehend that resilience in public memory is not permanence but conscious involvement in perpetual alteration.

6. Conclusion & Future Directions

6.1 DESIGNING FOR RESILIENT INTELLIGENCE IN VOLATILE DIGITAL ENVIRONMENTS

This research started with a provocation: how might we think of resilience in a time of algorithmic amplification and memetic volatility? Intelligence cannot be constrained to computation. Instead of focusing on computational attributes of algorithms, the study looked at resilient intelligence as a human-design capacity, the capacity to interpret and ethically negotiate ephemeral public memory in volatile digital ecologies.

To investigate this question, the work proposes MEMESCAPE, a speculative design prototype, reframing digital memory as a process rather than a repository, using ecological metaphors, symbolic engagement, emotional friction, and purposeful deterioration.

The findings of this study were more suggestive than conclusive since it was a small exploration. But participants asserted alternative interface designs could facilitate additional forms of interaction with digital memory and described heightened awareness of context, shifting circumstances when exploring the prototype.

It is worth noting that resilient intelligence is not the same as indifference to ephemerality. Resilient intelligence is the recognition that public memory is inherently unstable, and the reaction to this is one of attentiveness, not panic. MEMESCAPE's refusal to accept total preservation contradicts platform logics that associate accumulation with value. Instead, the system puts forward a difficult truth, that the possibility of memory's resilience may necessitate both recollection and release.

This work's primary contribution is the development and preliminary testing of a design framework rather than the validation of a new archival system. The study blends concepts from digital heritage, memory studies, and speculative design, which highlights for designers a fresh angle to reflect on ephemerality, uncertainty, and public memory.

The research results suggest that user interfaces could be designed not solely for information storage but also for reflection, interpretation, and ethical engagement. Under such conditions, the central design question is no longer "How do we preserve everything?" but "How do we develop the capacity to think within changing conditions?" Further study with more diverse and larger participants is required, but MEMESCAPE illustrates how speculative design provides a pragmatic research approach to investigate emerging issues in digital memory. MEMESCAPE presents one potential solution: by transforming interfaces from engines of efficiency into educative landscapes.

6.2 LIMITATIONS AND FUTURE RESEARCH

This study's limitations include a small purposive sample and no comparable circumstances with other interface paradigms. The researcher was the designer and the facilitator of the study, which affected the visibility of the study. These limitations do not negate the study, but the findings should be qualified in their degree of assertiveness. MEMESCAPE's future development will therefore require four interrelated pathways.

Participant Role Variation: While the sample consisted of meme creators, communication designers, digital media users, and a cultural critic, the small number of participants restricts the extent to which comparisons can be made. Nevertheless, the field notes show preliminary variations that should be reported with caution; for example, meme creators mostly concentrated on mutation/remix pathways, designers on metaphor readability and interaction signals, and critics on discursive ethics and power. These observations are suggestive rather than definitive and should be regarded as an outline for future comparative research.

6.2.1. Infrastructural Resilience and Governance

To involve entities such as museums, libraries, and universities, MEMESCAPE needs to develop into a deployable architecture that is ethically sound. This involves governance practices that prioritise selective retention, community stewardship, provenance tracking, and context-sensitive access beyond indiscriminate preservation.

6.2.2. Analytical Augmentation Without Interpretive Replacement

Further advancements in the field of AI may enable a future iteration of the MEMESCAPE in the form of multimodal analysis of sentiment drifts, mutation patterns, and/or provenance chains. However, any augmentation ought to be transparent and assistive. The goal is to expand and enhance human interpretation rather than replacing it with the certainty of machines.

Modules for the mitigation of misinformation and coordinated amplification could provide the users with the ability to visualise narrative forks and provenance chains to understand the movement of memes across ideological boundaries. Nevertheless, the idea of transparency must be harmonised with the idea of privacy and community ethics.

6.2.3. Experiential Expansion: Immersive and Inclusive Design

Further development of MEMESCAPE into AR or VR spaces could also support more integrated interactions with public memory. However, this would require remaining mindful of accessibility, low-bandwidth use, assistive sensory cues, and cultural variations to ensure that resilient intelligence does not become an elite literacy, and accessibility has to stay paramount. Volatile digital environments influence a wide range of audiences. Therefore, an infrastructure advantage should not limit one's ability to traverse it.

Through all of the above directions, the core principle that guides the intervention is the same: the sophistication of the technology must serve depth, rather than acceleration.

6.3 FINAL REFLECTION: THE INTERFACE AS ONGOING PRACTICE

We inhabit a historical time that is characterised by the fact that nothing is ever lost, yet everything is always ephemeral. The paradox of digital memory in the digital age lies in how it is at once both permanent and unstable.

This study does not attempt to resolve these drawbacks of digital memory. Instead, it seeks to immerse itself in it and investigates how designers could look at instability in a different light. The findings imply that metaphor, reflection, and purposeful ambiguity might inspire more critical thinking about the memories' formation, evolution,

and disappearance on the internet, highlighting that resilience in public memory is not accomplished through total retention or sentimental preservation.

Designing for resilient intelligence begins with the fact that interfaces are not neutral. They direct attention, memory, and also extinction. Design's purpose, therefore, is not only to improve engagement but also to foster discernment. So, MEMESCAPE operates more as a research proposition than as a complete project. It illustrates how speculative design may be utilised to investigate questions that are uncommon to investigate through conventional approaches alone. Its real significance is not proving a new preservation method but opening a conversation on how societies could interact with memory in contexts of constant transformation.

With digital platforms playing a growing role in influencing what is remembered and forgotten, resilience may be less regarding preserving everything and more about discovering thoughtful approaches to navigate uncertainty. Acknowledging the difference while offering settings in which that difference could be wisely negotiated is the foundation of resilient intelligence. The study implies that design is capable of helping develop that capacity and emphasises the need for further empirical studies to test, refine, and extend these notions.

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