

# Preserving memories beyond museums: navigating personal memories through technology

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## Abstract

Social media, digital diaries, and self-tracking tools allow us to store and share reflections and memories. However, with the large amount of data it gets messy, unstructured and becomes a disorganized collection of links and data entries. This paper was inspired by creative projects like Hereafter AI<sup>1</sup>, Story worth<sup>2</sup>, Digital Diaries<sup>3</sup> which tried to re-imagine a way to store and interact with memories by shifting from long lists of data to a more structured and interactive way prompting reflection. This paper explored studies on memory and reflection, and existing projects that foster reflection. Based on that, we came up with a proposal of a design concept with the goal to generate a discussion on designing technology for embodied cognition that facilitates reflection. Technology that not only allows us to store memories, but also reflectively interact with them.

## Keywords

Personal informatics, cultural memory studies, reflection, embodied cognition, interactive technology.

## Introduction

Different cultures have developed various ways of preserving memories over time, they are diverse and reflect each culture's unique histories, values, and traditions [1]. These methods include oral and written stories, visual representations, and tangible or intangible objects, each carrying cultural, personal, or psychological significance. Objects, in particular, facilitate the development of psychological attachment [2], as they embody memories of places, times, relationships, and emotions in a significant and almost ritualistic manner. Social media, digital diaries, and personal informatics have become ubiquitous in recent years, providing us with an easy way to store and share our experiences and memories. As digital tools continue to advance and gain widespread adoption, memory preservation and identity formation undergo significant transformation and change. However, as we generate more data through these tools, it can get overwhelming, disorganized, making it difficult to make sense of our experiences and thoughts. This led to a

desire to re-imagine a more structured and interactive way to store and interact with memories that foster reflection.

We explore memory and reflection to offer insights into technology to support processing memories in a reflective way. We focused on two research questions: 1. What are the existing approaches to encourage reflection when storing memories? 2. How can we design tools for embodied cognition that facilitate reflection and enhance our ability to make sense of our memories and experiences? The initial section of the paper explores the backdrop of memory studies and the origins of reflective thinking. Firstly, it delves into memory studies to analyze the processes involved in forming, processing, and forgetting our experiences. This is followed by an examination of reflection and its various purposes. This theory provides us with an insight on cultural memory nuances, active and passive forgetting, and equip us with ideas on how to design tools that facilitate reflection on life experiences while storing them digitally. We propose a design concept for storing memories and encouraging reflection in that moment, in addition to the ability to revise and process previously stored memories. To conclude, we use the design rationale as an example to raise the importance of designing technology for embodied cognition with a purpose to facilitate reflection and make sense of our experiences in a more interactive and insightful way.

## Memory and Reflective Practices

### Communicative memory vs cultural memory

Contemporary Egyptologist and cultural critic Jan Assmann extensively studied memory and distinguishes between communicative memory and cultural memory, as proposed by Halbwachs in the 1980s [3]. Assmann suggests that communicative memory involves varieties of collective memory. It is formed through everyday interactions with others, is disorganized, and lacks permanence. While cultural memory is more distant from daily life, is often fixed and unchanging over time. The author explores the transition between these two forms, noting that collective memory evolves into an objectified culture and eventually becomes

<sup>1</sup> HereAfter AI Interactive Memory App (n.d.). <https://www.hereafter.ai>

<sup>2</sup> Storyworth - Everyone has a story worth sharing. (n.d.). <https://welcome.storyworth.com/>

<sup>3</sup> AHO-WORKS-DESIGN-A2021. (n.d.). <https://aho.design/project/digital-diaries>

history in the form of texts, photography, monuments, etc. Assmann views memory as primarily collective and almost never individual. Yet individuals have some flexibility [4] in how memories are altered, distorted, and fabricated to support aspects of the self. In this paper we focus on individual memory formation within the context of cultural memory.

### **How are memories shaped?**

Assmann [3] outlined six characteristics of cultural memory: concretion of identity, capacity to reconstruct, formation, organization, obligation, and reflexivity. Preserving memories helps individuals in defining their identity, forming close relationships, and navigating their environment. Additionally, individual memories offer a sense of continuity and stability in times of change or uncertainty. In addition, preserving memories offers practical benefits, such as learning from the past to avoid repeating mistakes, honoring ancestors. This can involve passing down stories, traditions, and personal objects from one generation to the next. This practice is universal across cultures, serving to define collective identity and pass on cultural knowledge [5]. Common reasons for preserving memories include maintaining cultural and personal identity, connecting to the past, educating future generations, honoring important people and events, and ensuring cultural continuity [6].

The influence of our social environment on our brains, coupled with the limitations of individual memory capacity, emphasizes the significance of reflecting on our memory choices [1]. This raises the consideration: should we take a more proactive approach to determining what to remember and what to forget? There is active and passive forgetting [7]. The first one is often linked to a form of reflexivity, it is intentional, is related to the acts such as “trashing and destroying” and may bring internal social transformations. Whereas passive forgetting is non-intentional and may be related to “losing, hiding, dispersing, neglecting, abandoning or leaving something behind”. The paper proposed that forgetting is the normality of personal and cultural life, while remembering requires “special and costly precautions”, often being taken by the cultural institutions such as museums. Interestingly, remembering is also divided into active and passive sides, where institutions of active memory preserve the past as present (the canon) and passive memory preserve the past as past (the archive). Thus, active memory is meant to be used for continuous repetition to pass on cultural messages and can be repeatedly re-used and appreciated. Whereas the passive memory can be seen as an unmediated cultural storehouse.

Let’s keep the idea of refining memories before “remembering” them. For example, in the context of collective psychology, specifically traumatic events and experiences, active memory can be used to support its formation or destruction. In narrative psychology one can “actively construct” their memories using the approach of intentional construction to transform the self, a personal identity, and social

relations [8]. By examining the role of reflection in memory storage and processing, we can see the ways in which narratives can reshape our understanding of history and memory, fostering resilience and inspiring collective action for a more sustainable future. Notably, the quote “In remembering, one faces the world; in forgetting, one faces oneself” [9], highlights the intentional act of forgetting [9], leading us to the subsequent section on reflection.

### **What is reflection, why engage in it, and how?**

The concept traces its roots back to Socrates' teaching methods over 2,500 years ago, when through his famous questioning method, he discovered that people's confident assertions of knowing could not be supported by reason and rationality [10]. Today, terms like critical, reflexivity, and reflection are shared across practice approaches like social work, education, psychology, and philosophy. Some of the terms are used interchangeably, posing challenges to infer shared meanings [11]. Reflection involves examining thoughts, feelings, and behaviors to gain deeper awareness and understanding of the world. It involves considering different perspectives, viewpoints and examining the implications and consequences of one's actions. As well as identifying areas for growth and developing strategies for improvement.

Schön's work in the 80s distinguishes between reflection-in-action – knowledge accumulated from everyday experience, and reflection-on-action – happening afterward [12]. Practices like journaling, seeking out new experiences, seeing feedback to gain a new perspective can foster reflection and they are mostly based on reflection-on-action [13]. Overall, reflective thinking involves a series of cognitive processes, such as considering, analyzing, and interpreting experiences and events to gain a deeper understanding of them. It is a way of examining and evaluating thoughts, feelings, and behaviors to learn from them and to make informed decisions about the future [10].

Alongside the benefits of reflection, there are also defined purposes associated with it, such as educational, facilitating professional development [11]. Reflection fosters self-awareness, self-transformation, and intercultural understanding, aligning with critical and social goals. Integrating it into daily life enhances self-understanding, personal development, and societal improvement by fostering empathy and perspective-taking [14]. Furthermore, reflection helps sense-making by establishing “relationships and continuities” within experiences and between one's own knowledge and one created by others [15].

Mihaly Csikszentmihalyi emphasized the challenge of “keeping ideas straight without the assistance of a sensory template that gives them boundaries and direction” [2]. Similarly, Francis Bacon recognized the risks of leaving the mind to its own devices. Descartes further argued for the systematic disciplining of the mind to guide it the thinking process [10]. These insights underscore the natural need for structured support to guide a wandering mind, leading us to

the subsequent section, which discusses and explores various methods and tools for such support.

### Advancements and design directions in technology for reflective thinking

Places like museums and archives help to preserve memories by safeguarding and sharing these resources with the public. The stored artefacts go through a selection and are filtered based on the values and end goals of the institutions. Thus, their accessibility remains limited, prompting the exploration of alternative avenues for individuals to curate and share personal experiences [1]. Alternatively, there are online tools allowing people to “create their own museum” and to construct their own repositories of memories and reflections (e.g., social media, journaling, educational and psychological tools). In this context, our focus lies on research on more immersive and data-rich interfaces.

For example, Personal Informatics presents many opportunities [16], technological advances in sensors and portable devices allowed a rapid development of self-tracking tools. Which helps individuals to gather personal data useful for self-reflection and self-knowledge. Findings from a diary study on self-tracking systems revealed differences between experienced users and users without prior experience and proposed seven strategies on designing better tools. Interestingly, in their discussion they considered a variety of designs and drew inspiration from interdisciplinary research areas, from tangible interfaces to virtual environments and video games [16]. This proposal goes in line with memory research mentioned by Human-Computer Interaction (HCI) researchers [17]. They delved into multimodal cues to enhance memory engagement, for example audio, visual, touch, but also olfactory and gustatory senses. They suggest future design trajectories, such as Human-Food Interaction and flavor-based cues in memory technologies. For now, these concepts have been predominantly investigated within technologies designed for aging individuals and memory support for dementia. However, there is the potential to extend to other user groups.

While personal informatics presents promising opportunities, it also raises issues of privacy, tracking, managing and visualizing data [18]. Authors discuss innovative approaches, such as revisiting the notion of gamification practices and thinking beyond prizes, points, and extrinsic rewards to make it more meaningful. They praise data visualization and storytelling abilities of video games, where users connect and identify with the avatar and deepen their reflection and engagement because of the established emotional link between the avatar and the user. Another study [19] concluded that conversing with chatbots and better understanding yourself and experiences present mental health benefits. Both online unguided chats and chats guided by prompts demonstrated a significant reduction of anxiety.

### Guiding principles for reflective thinking

To lay out effective practices for fostering reflection, we have synthesized actionable concepts drawn from existing literature [13, 15, 17]. These principles can serve as a guide when designing tools for promoting reflection:

1. **Providing prompts:** for example, written questions or visual prompts.
2. **Engaging multiple senses:** designing interactions that encourage users to think about their own experiences, thoughts, and feelings. For example, utilizing specific colors, listening to familiar sounds, smelling odors that trigger emotions.
3. **Allowing for self-expression:** opportunities to express themselves creatively, for example, through singing, writing, painting.
4. **Providing feedback:** giving users feedback on their work or responses can help them reflect on their own ideas and understand them more deeply.
5. **Encouraging collaboration:** interactions that encourage users to work together and share ideas.
6. **Providing opportunities for exploration:** exploration and discovery of new ideas and perspectives by taking up new hobbies, paths and listening to different points of view.
7. **Facilitating reflection through common practices:** activities such as journaling or recording yourself and listening to the recording.
8. **Using visual cues:** cues such as photos, graphs, diagrams to remember something or see complex ideas connected.

### Design Concept: Senseebo - AI-powered memory companion

The ideation process behind Senseebo's design concept was influenced by 5 key themes from brainstorming workshops: 1. *Dreams and unconsciousness*, 2. *Retrieving lost memories*, 3. *Memories of the deceased* 4. *Storing daily memories and their visual representation* 5. *Learning about global traditions and rituals for memory retrieval and reflection*. These themes served as the foundation for design dimensions, crucial in sparking ideas for the artefact's interaction design. The primary focus became the “*memory interaction*” dimension, that involves storing, processing, retrieving forgotten memories, or removing. A secondary dimension “*state of consciousness*”, inspired by ideas around dreams, unconsciousness, and memories of the deceased, further enriched the ideation process and contributed to the final design concept.

**Senseebo** is a chatbot designed to construct and process memories. using data from a wearable device that tracks body signals and translates them into emotional states. It facilitates the construction of a memory map, review, process, and actively forget memories. It is aimed for individuals

seeking to reflect on their experiences and manage memories that trigger negative emotions.

### Three features of Senseebo

1. **Construction Room** serves as a platform for reconstructing memories, leveraging data from wearables to prompt users to construct emotionally charged memories. A Speech-To-Text system extracts keywords from user utterances, contributing to the generation of images stored in the Canon Room.
2. **Canon Room** allows users to revisit and reflect upon existing memories cataloged with dates, keywords, and emotional state data obtained from the wearable device.
3. **Forgetting Room** introduces a distinctive approach to memory processing by facilitating active forgetting. Users engage in a digital ritual that involves symbolically burning a memory, embodying the act, and prompting intentional forgetting.

### Conclusion

Drawing inspiration from innovative examples, this paper proposed a design concept Senseebo to reimagine memory

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storage and interaction by transitioning to more organized and interactive formats that encourage reflection. Through our exploration of memory and reflection studies, examination of existing solutions, we seek to stimulate discussions on the creation of technology for embodied cognition that not only facilitates memory storage, but also encourages reflective interactions with those memories. The design concept encourages reflective memory storage, reconstruction of the past, and understanding of emotional state through wearable's data. By prompting users to vocalize memories, it facilitates different perspectives and provides feedback via follow-up questions, keywords, and images. Additionally, it introduces active forgetting through a digital ritual of burning memories, advancing action-on-reflection. While requiring further testing, it serves as a foundation for designing reflective tools for memory formation and processing.

We anticipate digital technologies becoming integrated into memory studies, cultural studies, and critical thinking and reflection theories. While current efforts primarily target theoretical tools or technology for addressing memory impairments or aging populations, we foresee more projects actively supporting memory processing through technology. This will enhance our understanding and application of reflective practices in the digital realm.

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