Dust Off Kindle Highlights With Quologue: Surfacing Personal Data With Generative AI for Reflective Experiences

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Abstract

People's annotations on books can serve as valuable traces for people to revisit their past thoughts, emotions, and other experiences. For e-books, however, the lack of physicality and their e-reading infrastructure make it difficult for people to revisit them as these traces continue to accumulate in digital archives. In this paper, we describe the design and deployment of Quologue, an LLM-powered web application that allows users to reconnect with their e-book highlights through ongoing dialogue and stepwise interactions. We conducted a field study with 10 participants over 8 weeks. Our aim was to investigate the reflective and self-expressive potentialities of personal e-book metadata; and to learn about any opportunities and tensions that emerge from surfacing one's data with a generative AI model. Findings revealed that Quologue generated diverse reflective experiences and influenced participants' current digital highlighting practices. We conclude with implications and opportunities for future HCI studies and practice.

CCS Concepts

• **Human-centered computing**; • **Interaction design; Interaction design theory, concepts and paradigms; Empirical studies in interaction design;**;

Keywords

Metadata, E-books, Slow Technology, Temporality, Generative AI

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1 Introduction

Books and the everyday practice of reading have played important roles in people's lives, enabling a wide range of experiences, including personal growth [49], knowledge acquisition [12], identity construction [16, 37], and ways of socially connecting to others [90]. To further engage with books, people make annotations (e.g., highlights, making notes in the margins) to mark ideas that they may find personally significant, confusing, or to indicate agreement or disagreement [83]. Annotations also serve as a tool to show one's ownership of the book or to pace one's reading speed by slowing down to log a reflective annotation [27]. With the rise of electronic books (e-books), reading text and annotating through digital media is becoming increasingly convenient via technologies such as mobile devices, e-readers, e-ink, and e-reading platforms like Amazon Kindle [58]. There are e-book reading platforms on the market (e.g., Kindle, Kobo) that simulate annotative features that involve creating highlights, margin notes, and bookmarks. These traces people make on e-books are then recorded in digital archives as metadata, providing people with precise histories of their annotative reading practices with books. Considering that people often choose e-reading for these features which print books cannot afford [38], digital annotations can offer unique, highly meaningful traces of personal data, especially for avid e-book readers.

As e-books continue to gain traction, the growing archives of e-books and readers' interactions with them pose new issues and opportunities for the HCI community. Unlike print books, which occupy visible spaces in people's homes and prompt them to be casually revisited over time [33], e-books largely do not occupy a physical space, remaining largely invisible in everyday life. As e-book archives grow larger, this tension can create barriers for e-book readers to revisit their potentially valuable resources that are tied with past thoughts, emotions, experiences, and reminders for future actions [73, 82]. This problem leads to missed opportunities for self-reflection since re-reading these traces can have effects closely tied to identity, helping us notice changes in ourselves or experience the same text providing a familiar sense of comfort [33].

Yet, there is limited knowledge on strategies and concepts that could inform how we can promote reflective experiences with e-book metadata. In parallel, there is an ongoing concern in the HCI community to develop alternative approaches for people to



Figure 1: The user interface of Quologue. The user sees three keywords—interdependence, paradox, and philosophy—on Quologue without knowing which book or highlight these keywords are generated from. For the duration of the week, the user's task is to work on a short reflection using the keywords in the bottom textbox.

experience their personal data in more creative, expressive, and open-ended ways [14, 20, 21, 50, 66, 100]. However, examples illustrating how such engagements with personal e-book data can be mediated through the creation and study of new design artifacts remains underexplored in the HCI community.

In this paper, we reimagine e-reading as dialogue-like interactions that continue to unfold after the first reading. Our aim is to prompt readers to revisit and recontextualize their digital past in the present. To mobilize conventional data archives into materials for conversational interactions, generative AI can be a potentially valuable tool based on its semantic comprehension abilities. As more HCI researchers are exploring the potentials of generative AI for personalizing user experiences [48] and enabling meaning-making with personal data [4, 98], it is timely to consider the benefit, frictions, and limits of new ways for revisiting one's personal metadata through ongoing dialogue.

Our design research inquiry is guided by the following questions. Considering reading as a lifelong practice, how can personal e-book metadata be mobilized as a resource for an alternative way of e-reading that encourages self-reflection over time? In what ways might generative AI be leveraged as a resource to help engage with one's digital archive in a valuable way? And, in what ways could surfacing one's digital traces on e-books influence people's awareness of their own personal data and their digital reading practices?

To pursue these questions and ground our own thinking in this emerging space, we engaged in a Research through Design (RtD) [30, 108] process that ultimately led to our creation and implementation of *Quologue*—a web application integrated with a large language model (LLM) that enables users to express themselves by using their own e-book highlights as a resource (Figure 1). Our RtD process was inspired by the concept of *slow technology* [35, 67], which we used as a generative theoretical lens to explore the temporal, interpretive, and biographical qualities of e-book personal data. In its final form, Quologue does not provide access to full e-books or the surrounding context of highlights; instead, it operates solely on the highlight data users choose to upload. Each week, the system selects one highlight at random from a user's archive and generates three keywords through thematic analysis. Initially, Quologue reveals only these keywords—without the quote, book title, or author—prompting users to reflect and write a short interpretation based solely on this abstract metadata. Once a reflection is submitted, Quologue synthesizes it with the original quote from which the keywords were drawn, producing a "remix"—a new textual artifact that blends past reading data with present-day reflection. Over time, these remixes transform the highlight archive from a static record-keeping tool into a living medium for creative self-expression.

We conducted an eight-week field study of Quologue with 10 participants to explore the reflective and self-expressive potential of personal e-book metadata, and to surface the opportunities and tensions that arise when such data is engaged through a generative AI model. Findings revealed that the minimal set of keywords generated by Quologue acted as ambiguous traces of participants' personal data, often inviting interpretation and recontextualization. Participants also experienced a range of reflective engagements, shaped by different elements of the system over the course of weekly stepwise interaction journeys with it. Several participants reported a shift toward more mindful and purposeful highlighting behaviors as a result of using the system. We conclude with a discussion of how digital reading infrastructure might evolve to support more personally meaningful engagements with reading data and the resulting design implications for how e-reading platforms might enable people to construct greater value with digital books. We also highlight how a keyword-based, stepwise interaction model could offer interpretive flexibility in LLM interventions. This paper offers two contributions. First, it provides insights into how design artifacts can support reflective engagement with e-book data typically locked within proprietary systems. Second, it offers a design case illustrating key benefits and limits of mobilizing generative AI to open up new possibilities for e-reading and personal data interaction.

2 Background and Related Work

2.1 Reading Practices Through Different Media

The popularization of e-books and e-book platforms have enabled people to have access to their collection of books from anywhere as long as they carry their e-reader or other portable devices. Despite this advantage, many people still choose paper as a medium for their reading [6, 43, 64, 86]. Gruning [33] sheds light on the nuanced motivations behind choosing a reading medium by positing that the motivations are shaped by factors such as anticipation for future uses and identity. For instance, since paper books can be displayed in the owner's domestic spaces, the paper books that one owns could function as a means of reinforcing one's personal identity while signaling this to others. In contrast, Gruning notes that the lack of a material presence makes e-books less visible in everyday life, affecting how people rarely reread their e-books and value them.

When e-books are favored, people are often drawn due to the unique digital features where physical books fall short. Hupfeld et al. [38] point out the trade-offs people consider when choosing which medium to read on. E-books offer notable affordances such as the ability to carry large volumes of text, to integrate with digital elements (e.g., embedded links), and to access them easily regardless of location. These affordances can make e-reading more attractive to people; however, even with these advances, there are limitations in e-reading infrastructure that restrict users' interactions with text. When people make annotations on e-books, e-reading applications can restrict readers' ability to express their intent in highlighting and annotating, e.g., "forcing a highlight to be continuous when the reader wants to fragment it, or imposing neatness on a reader when she wants to scrawl" [58].

Additionally, many e-reading platforms restrict users' freedom to manipulate or interact with their data stored within their system such as not supporting features for exporting their annotations [46]. In the case of Kindle, users' comprehensive history of highlights from all books is stored in a separate text file named "My Clippings.txt," which can only be accessed by connecting their Kindle to a computer and navigating through the file directory to locate it. Even with this method, this text file is written in a distinct format, creating barriers for lay users to engage with their data. When this type of data is collected and controlled by proprietary infrastructure, it can "appear to be uncontestable, or natural parts of the world," [29] making it difficult to imagine an alternate form of the technology. To tackle this problem, in our earlier work [46], we documented the process of extracting and repurposing e-book data stored and controlled by an e-reading application. Through this process, we mobilized personal e-book metadata as a design resource for various new usages.

Collectively, the works reviewed above show the potential for reimagining technologies that help users develop greater awareness of their personal history of e-book highlights by leveraging these uniquely individual data traces. However, e-book archives often remain disconnected from visible daily life, with existing e-reading infrastructures offering limited support for sustained engagement or reflection. Our design research inquiry aims to address this gap by extending post-reading practices over time—transforming e-book highlights into gateways for ongoing dialogue with both the text and one's evolving self. We also explore how living with a new system may influence people's perceptions of their reading practices and their digital e-book archives, which are often forgotten or ignored in everyday life.

2.2 Supporting Self-Reflection through Personal Data

Personal metadata, capturing aspects of our temporal life, have the capacity to represent elements of people's personality, identity, and emotional experiences [45, 74]. However, HCI researchers have raised concerns about the storage of these potentially valuable traces in extensive digital archives that remain invisible in people's daily life, contributing to limited understanding and control of their digital footprint [66, 73]. Many HCI scholars have suggested various productive applications of personal metadata, including using metadata as a resource to empower people's ability to manipulate and customize their digital possessions [73] and to encourage the data owners' meaning-making experiences to highlight its reflective potentials [34]. This approach aligns with a growing interest in designing technologies that go beyond short-term functional utility to foster deeper user engagement and reflection.

In Hallnäs and Redström's seminal proposal of slow technology, they call for design practice that conceptualizes technology as an entity "that surrounds us and is part of our activities over longer periods of time" [35]. This paradigm of slow technology also challenges the dominant HCI tradition of designing technologies for the value of optimizing performances and instead advocates technologies that create moments of self-reflections or critical reflections towards technologies [67]. A variety of research artifacts have been designed and built to invite users to actively slow down and reflect on their rapidly accumulating data. These artifacts explore the uses of different personal data, including music (c.f., Olly, Olo Radio, & Musée) [41, 66, 69], photos (c.f., Capra [70], PhotoClock [14],), location histories (c.f., Memory Tracer & Memory Compass [100]). These efforts collectively embody human-data relations that evolve with users over time and support rich reflections. Notably, there have been more attempts in recent years to give users a degree of freedom and agency in controlling the pacing of the system, such as PhotoClock [14], Chronoscope [15], and CrescendoMessage [93]. These new research artifacts exemplify that the theory of slow technology is not restricted to promoting temporal "slowness" by limiting almost all user control on the pacing of the system, and the concept of "slowness" may extend to new dimensions [67].

It is also worth noting that while these slow technology artifacts surface valuable past digital traces from their archives, they have not yet ventured into using these metadata as materials to give users creative control on generating and feeding new data into the system as a means of self-reflection. This presents an interesting area of research since self-expression through writing, in particular, has been acknowledged as an effective mode of self-reflection [24, 85]. Scholars have examined the role of self-expression through writing in navigating personal emotions that may be hard to articulate or define otherwise [47] or helping reflections on one's professional practice [40], offering a unique avenue for insights and growth.

In our work, we incorporate the practice of self-expression through writing into a slow technology artifact, using traces of past reading experiences to recontextualize them in the present. We contribute to the ongoing research by exploring the potential of using personal e-book metadata, a unique kind of personal data that has received little attention. We examine the potential role of this text-based data in enabling users to co-create new data at the present moment of interacting with a system, in addition to surfacing past digital traces.

2.3 Exploring LLMs for Open-Ended Reflective Experiences

As the complexity of AI systems has grown extensively in recent years, research in explainable AI have pointed out the need for making the inner workings of AI systems more transparent and manageable by end users [53, 54]. These works are potentially valuable for enhancing trust and transparency in various context, including providing support for coding [92] and medical decision making [99]. On the other hand, there is an emerging body of work that views uncertainty in AI technologies as a design resource. For instance, Benjamin et al. [3] point out that some degree of uncertainty is inherently engrained in the nature of these technologies, and this uncertainty arises from their attempts in simulating real-world phenomena and the presence of noise in the data used to train the models. Their work presents concepts for harnessing this uncertainty as a design material, highlighting the dynamic potentials of AI technologies, such as machine learning predictions, in shaping human-world relations.

More specifically, HCI scholars have started to explore the role of AI in mediating reflective experiences on broader aspects of one's personal life through interacting with the data they collect or produce. Brand et al. [10] focus on the action of introspection, which refers to reflecting on one's inner self, to examine the ways various kinds of personal data can mediate this experience when powered by AI. They present various design concepts, e.g., supporting collaboration and alignment, encouraging confrontation and critical reflection, to reimagine the action of introspection with the help of AI. Lo [56] and Burg et al. [94]'s works exemplify the potential impact of using AI to reflect on the broader scope of our lives that extends beyond direct interactions with AI.

Among a wide range of AI technologies, in recent years, large language models (LLMs), in particular, have been the focus of many HCI researchers due to the proliferation of commercially available LLMs such as GPT models [109] and BARD [78]. LLMs refer to a subset of generative AI models that are pretrained on substantial amounts of textual data. Since they are probabilistic models, they can take in the same input text and yield multiple different outputs. For lay users who are non-AI experts, it can be relatively easy to manipulate through natural language, thereby lowering the barrier for them to create high-quality prototypes that produce semantically engaging text output through multi-turn conversational interactions [25]. Basic capabilities for a single run of LLMs span from categorizing or rewriting the input to generating a list of examples or a creative "hallucination" [101].

While LLM systems have often been implemented in the form of chatbots [2, 56] to encourage open-ended reflection, investigating more subtle ways of incorporating LLMs is underexplored in HCI. Rajcic & McCormack [81], for instance, built a table lamp that listens to people's conversations throughout the day and generates a poem based on the keywords drawn from the collected data. This work envisions a possible future where LLMs have become seamlessly integrated into our daily lives and support our everyday routine. However, it is worth pointing out that, for the input into their table

lamp, they make use of the inhabitants' conversations only from the previous day. Also, this lamp is not equipped with features that allow users to have some degree of direct creative control over the generated output, while users may still indirectly influence the input by being aware of this lamp during conversations.

Considering these points, we see an opportunity to explore how LLMs might support open-ended reflection by drawing on longer timeframes of one's personal history. In our work, we investigate personal e-book metadata archives as a potentially rich and underutilized source of input for LLM-powered systems—archives that store nuanced traces of users' past reading experiences. With *Quologue*, our design work and subsequent field study explores both the opportunities and trade-offs of using such metadata, balancing subtle prompts that encourage engagement with mechanisms that allow users to exercise creative control over their interactions.

3 Methodology

In prior work, we documented and reflected on the design process of an earlier version of Quologue [46]. We build on this by reporting on the iterative design process that followed the initial phase of our work and by conducting an eight-week field study of a highly robust version of this system. We describe our methodological approach as Research through Design (RtD) with an emphasis on design-led research in HCI (e.g., [28, 30, 91, 108]). We adopt a *designer-researcher* position to generate artifacts that investigate and respond to our research questions [13, 21, 68, 96]. Designer-researchers often function as a small team that is reflexively focused on the creative, experimental, and novel outcomes of the design process that are critically and reflectively arrived at through design practice (e.g., [21, 22, 70, 75, 100]). This approach gives prominence to insights emerging through the creation of real things that materially ground conceptual ideas through their existence. Our approach also draws inspiration from autobiographical design [19, 65], which we considered appropriate to gather nuanced insights and qualities of phenomena from designing and building this new kind of infrastructure, beyond what traditional user-centered design methods typically surface. These first-person insights were then iteratively and reflexively applied to make a series of adjustments to prototypes as they were lived with.

Based in a university located in Western Canada, our research team is composed of the first author (FA) who led the design of Quologue; two members who worked on building the Quologue system; and another member who provided supervision throughout the project. Our team engaged in early explorations with the prototype system for four months, and after building the web application, we iterated on its design over the course of six months. For the duration of the study, our team had bi-weekly meetings to discuss insights from using the prototype and building the prototype and to make design decisions for next iterations.

In this section, we will first provide an example scenario (see Figure 2) to illustrate how a user would interact with Quologue. We will then describe how slow technology qualities guided our overall RtD process, and conclude this section by outlining the design process, rationale, and implementation and providing an overview of our field study.

3.1 Quologue Design Process, Rationale, and Implementation

For our early explorations with e-book metadata and LLMs, we used FA's e-book metadata. FA has been a subscriber of Millie [88], an e-book subscription service, from March 2020 to January 2023 and saved 414 highlights on his archive. Each data point contained the quote highlighted, the title of the book, the author's name, and the date and time it was highlighted. Using FA's data for design explorations, we built a data pipeline that automated the tasks of communicating with a generative AI model to generate output. We selected the GPT-3.5 Turbo model to build the Quologue system because of the accessibility of the API, low cost, and ease of integration, which aligned with the practical constraints of our implementation process. Prior works have reported the model offers a favorable cost-benefit ratio while producing sufficiently high-quality text output for academic or reflective contexts [76, 103, 104]. These qualities made GPT-3.5 appropriate for the subsequent deployment study. During this period, for documentation, FA wrote over 20 diary entries which include a record of three keywords, FA's response to the keywords, the remix, and FA's personal reflection on the output detailing FA's motive behind writing a certain response or any emotional reaction. Through bi-weekly meetings within our team, we iterated on the design of the prototype system and built the web application over the course of six months.

3.1.1 Working with Slow Technology Qualities. In designing Quologue, we adopted the conceptual lens of slow technology to promote reflective experiences with e-book metadata that are potentially rich records of our past experiences. We reviewed articles on the theory of slow technology [35, 67] and found two qualities of slow technology that were particularly salient in guiding our design process. The two qualities—*ongoingness* and *temporal modality*—were instrumental in helping establish a long-term relationship with their e-book data that currently lack in its interactivity. The first quality, *ongoingness*, envisions slow technology that "continually chang[es] alongside [users], albeit at its own pace" [67]. On Quologue, users have the agency to influence the system output by directly providing the input as a response. Their responses are products of self-expression that uses traces of e-book metadata as creative materials. Thus, as they submit more responses and create new remixes over time, the highlights have the capacity to reflect more personal elements, making Quologue an evolving archive that transforms with their users. We aimed to focus on forming long-term relationships between Quologue and its users since the personal connections are more likely to gradually emerge over extended use.

The second quality, *temporal modality*, can be creatively applied when designing artifacts that focus on incorporating a certain form of time in its design of interactions with data. This design quality can contribute to "catalyz[ing] anticipatory, reflective, and interpretive experiences" [67] and was crucial for developing the concept of Quologue. For most commercially available e-reading services, such as Kindle or Kobo, e-book highlights are organized by different books. These data points serve as markers for noteworthy moments when one reads an e-book, and they can revisit the surrounding context by accessing their highlights. By nature, highlights data are contextual in these services. On Quologue, these book-based data

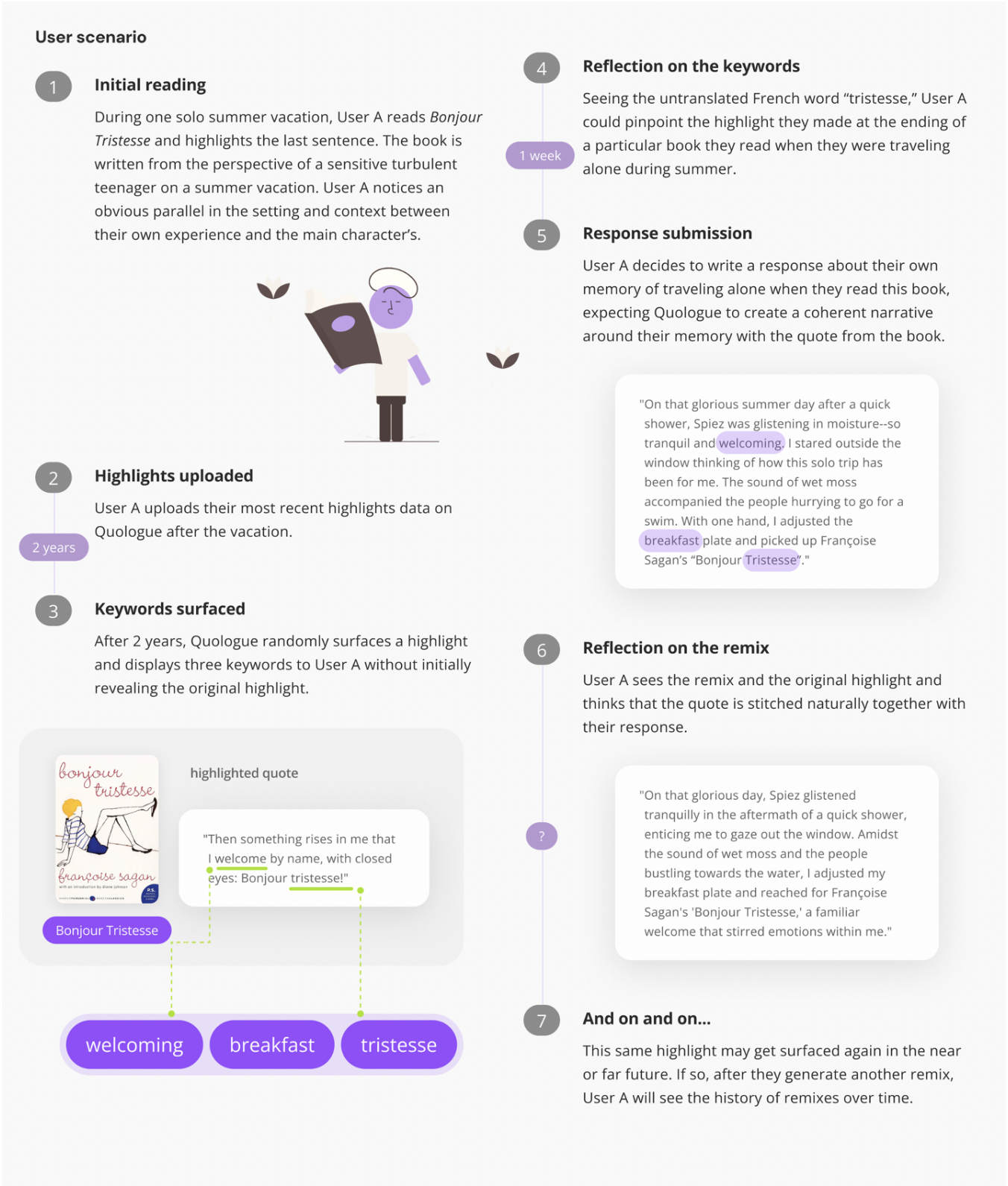


Figure 2: Quologue Example Scenario. This is illustrated based on FA's diary entry on August 7, 2023 (see Appendix C.3).

points are taken out of context and placed on a temporal dimension by letting users go through an elongated week-long interaction with only one highlight from their archive. Through this strategy, we sought to encourage users to slowly communicate with each of their digital traces that could otherwise have been easily overlooked in an entire list of highlights.

3.1.2 Quologue implementation. We built Quologue as a Next.js application hosted on Vercel (https://vercel.com/), a platform that facilitates deployment of web applications [110]. We used NextAuth.js to authenticate users, and the uploaded user data is stored on Amazon Simple Storage Service (Amazon S3). Our implementation supports both mobile and web environments. It was critical for us to achieve a high level of robustness in handling input data from various e-reading services (e.g., different versions of Kindle & Kobo) before we distributed it to real-world participants in the field study.

3.1.3 Quologue system description. Quologue is designed to work exclusively with users' highlights data, rather than providing access to full e-books or their surrounding context. In this section, we describe its key features and how we arrived at the final design.

Keywords & Response

In various HCI studies, the design quality of ambiguity has been leveraged to open up possibilities for various interpretations and open-ended experiences with personal data [9, 32, 44]. To support users' ability to infuse their own interpretations into their metadata in our context, we conducted in-depth explorations with the GPT model to determine the form of output for the context of re-experiencing e-book highlights. During this, we repeatedly encountered output that had a mix of true and false information with no indication of the validity evaluated by the model. This tendency was especially apparent when we prompted the model for longer responses, e.g., asking to recommend ten quotes that are relevant to one of FA's e-book highlights (see Appendix A). This observation aligns with prior work showing that longer outputs are more prone to hallucination [42], which seems intuitive since more text could increase the chance of misinformation. While working with this inherent uncertainty in the generative AI output, we also noticed that the GPT model consistently performed well in identifying high-level themes within a given text. This led us to think that generating keywords could act as a way to encapsulate the meaning of original highlights in an effective way while minimizing the risk of misrepresenting the source.

In the final design, every Monday, Quologue reveals only three keywords generated from a randomly selected highlight from a user's data. The keywords may not be directly present in the quote but instead reflect a broader theme. By removing the contextual anchors of the highlight for users—such as the book title, the author's name, or the full quote, Quologue transforms e-book metadata from factual reference points in the archive into prompts for personal meaning-making. We also instructed the model to select one keyword that is not directly sourced from the quote but is semantically related to the other two keywords (see Appendix B for the prompt). We added this requirement so that the one keyword would act as a gateway for users to potentially bring in new elements through their response that could enrich the meaning of the original quote in the output. Appendix C.1 shows how FA's experience was enriched by a new allegory that emerged from a new keyword that was not present in the original quote.

Following the keywords, users are asked to reflect and write a short text response in relation to the keywords over a week. We aimed to encourage them to reconnect with their e-book highlights while offering an opportunity to provide direct input into the system. This feature opens up various opportunities for users to change and distort their past digital records. This design decision reflects the slow technology quality of ongoingness, where artifacts develop meaningful relationships with users through sustained engagement with personally significant materials. We believe that the personal provenance of the keywords is key because we aim to preserve a sense of personal investment in the meaning-making process that would be absent with random prompts.

We arrived at the one-week pacing after iterations that varied from one to 10 days since a weekly rhythm provided an intuitive cadence for us to notice and engage with a new set of keywords. Our iterations suggested that the timeframe of a week allows sufficient flexibility to craft a response after several days of not actively interacting with Quologue. As users choose the time to reveal the original highlight as they submit their response, users can exercise some degree of control over the system pacing. We chose not to use explicit notifications, as they risk overwhelming users and disrupt the lightweight, ongoing nature of engagement that we intend to realize. This decision also aligns with the quality of slow technology that fades into the background without requiring direct user attention [35].

Remix

By synthesizing a user's past highlight and their response to three keywords, Quologue creates a remix. In envisioning this alternative way of experiencing one's e-book metadata archive, we hoped that our system would produce plausible connections between a user's past digital trace and their current reflection related to the trace. The non-deterministic nature of generative AI often led to ambiguous output, which prompted FA to read the text from a new perspective (see Appendix C.2), which reconnected them with the digital traces in different ways. These remixes sometimes served as bridges between FA's historical reading experiences and their current personal life, creating opportunities for reflection that span both literary and lived experiences (see Appendix C.3).

If the remix is unsatisfactory, users can click a "try again" option (see the blue block in Figure 3) to create one more alternative remix, and users can compare the two remixes. After testing different numbers of possible alternative remixes, we ultimately limited it to one since having more options made it more difficult to engage deeply with the generated text. After creating a remix, users can access the history of their interactions through the Quologue archive (Figure 4).

Interest of the week

Within the "next week" block (Figure 5) displayed under the stacks of blocks that show relevant metadata of a highlight, there is an "interest of the week" feature. This is an optional feature that asks users to submit a word that captures their interest of the week. This word gets surfaced as one of the keywords in the following week, and if a user does not submit any word, Quologue selects keywords through its regular generation algorithm. This feature

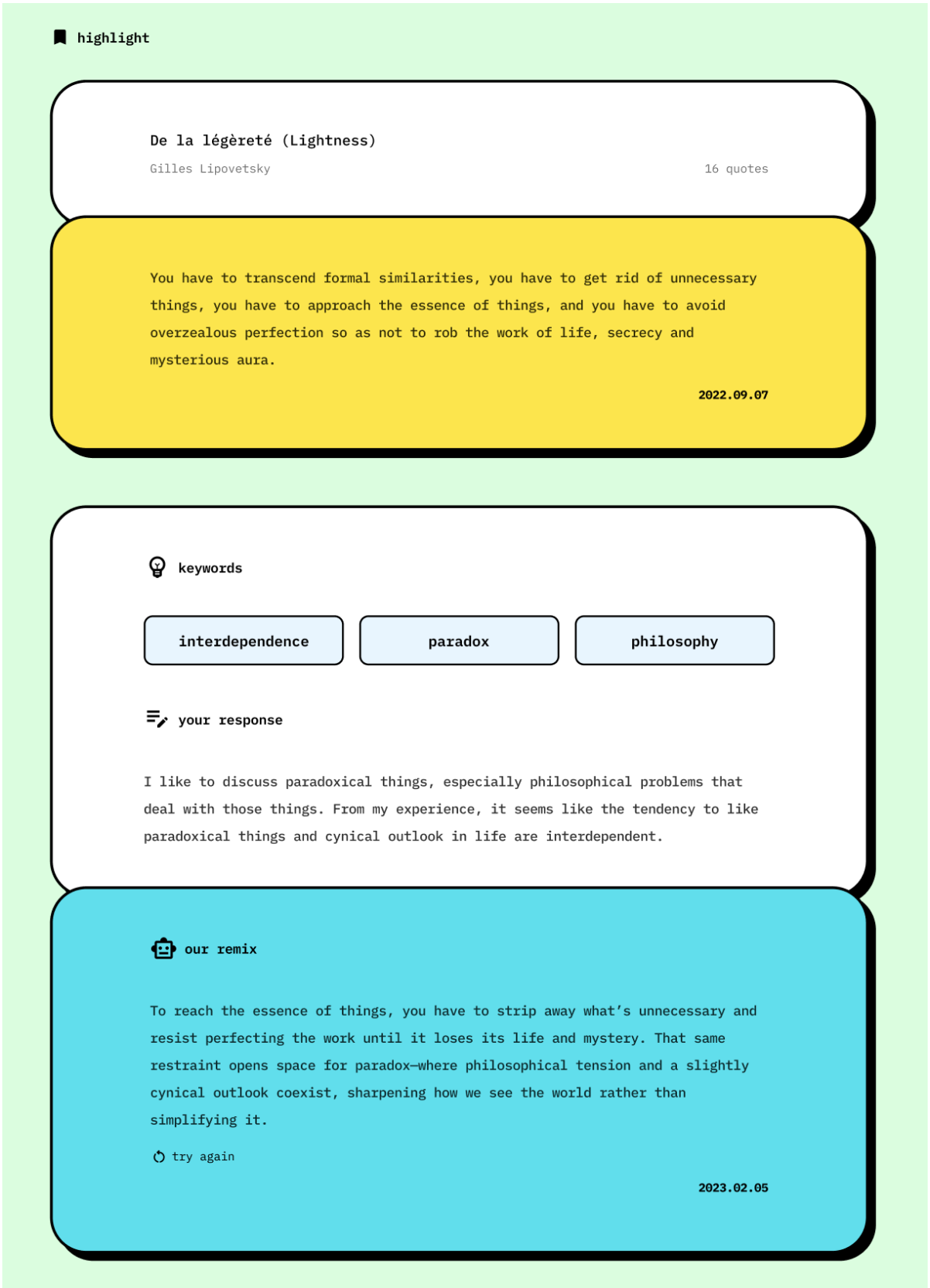


Figure 3: A user's view after submitting their response on Quologue. See Appendix D for the prompt we used to generate remixes.

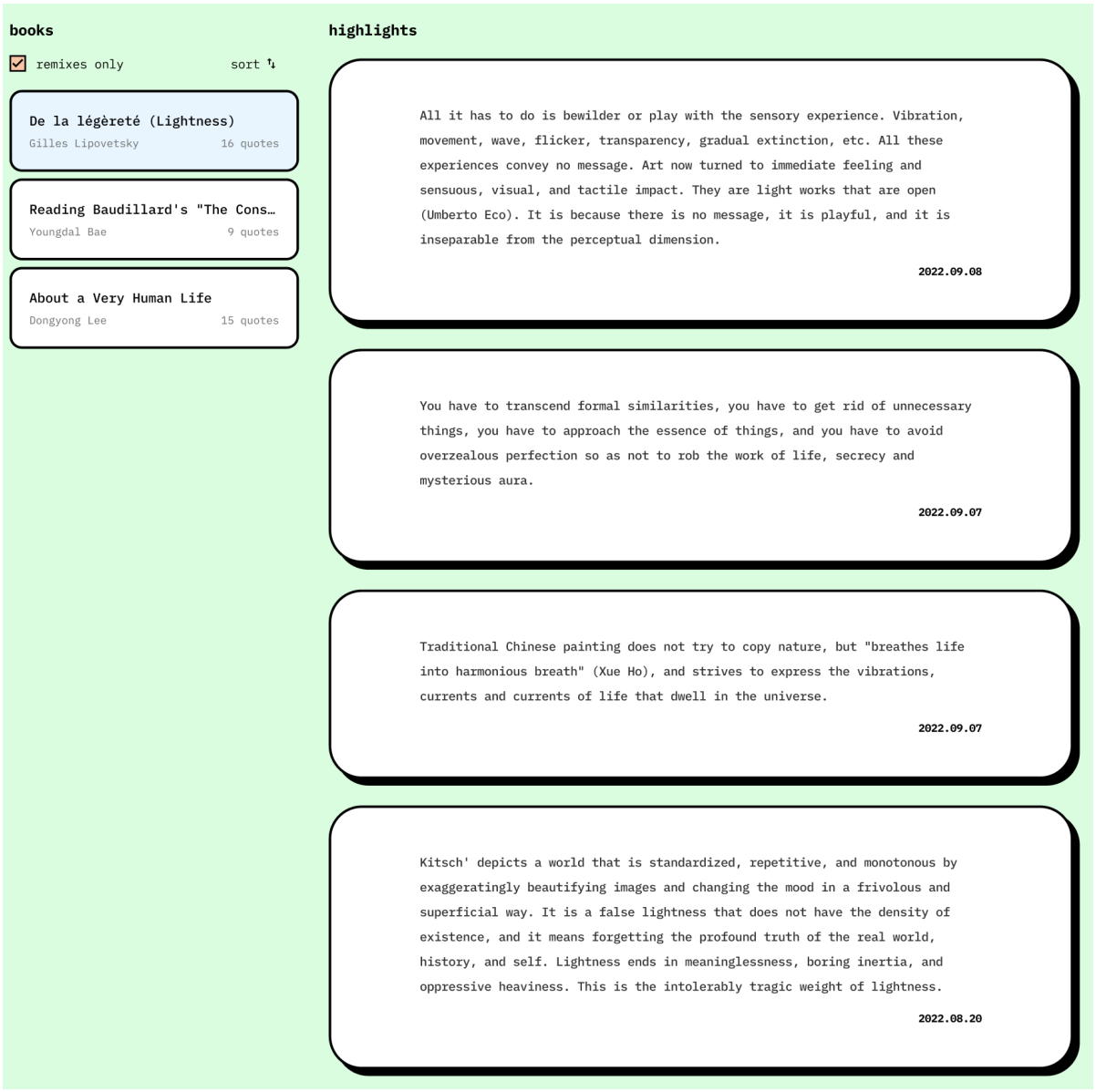


Figure 4: Quologue Archive. Here, users can filter out the highlights they have not remixed on Quologue by clicking the "remixes only" button on the top right corner. When a user clicks a highlight block, shown on the right column, it will display relevant metadata, including the keywords, response(s), and remix(es). Users can also see the alternative remix of each highlight if they have created it in the past.

encourages users to have layered reflections on one's multiple pasts—the time when one created the highlight and the previous week.

3.2 Field Deployment Study: Participants, Data Collection, Analysis

We recruited 10 participants from North America, i.e. the U.S. and Canada, through our team's prior research network, word-of-mouth, and posting on social media. In the case of social media, we posted our recruitment in online communities such as the Kindle subreddit on Reddit (https://www.reddit.com/r/kindle) where we believed viewers would likely to be closer to our target demographic who is enthusiastic about e-readers or e-reading in general. Similar to the aim of the original Technology Probes paper [39] and several field studies of new design artifacts since then (e.g., [31, 41, 69, 79, 80, 97]), we initially focused on a small group of participants to gain a rich, descriptive understanding of the research space to inform what might be salient issues for future research and practice. This

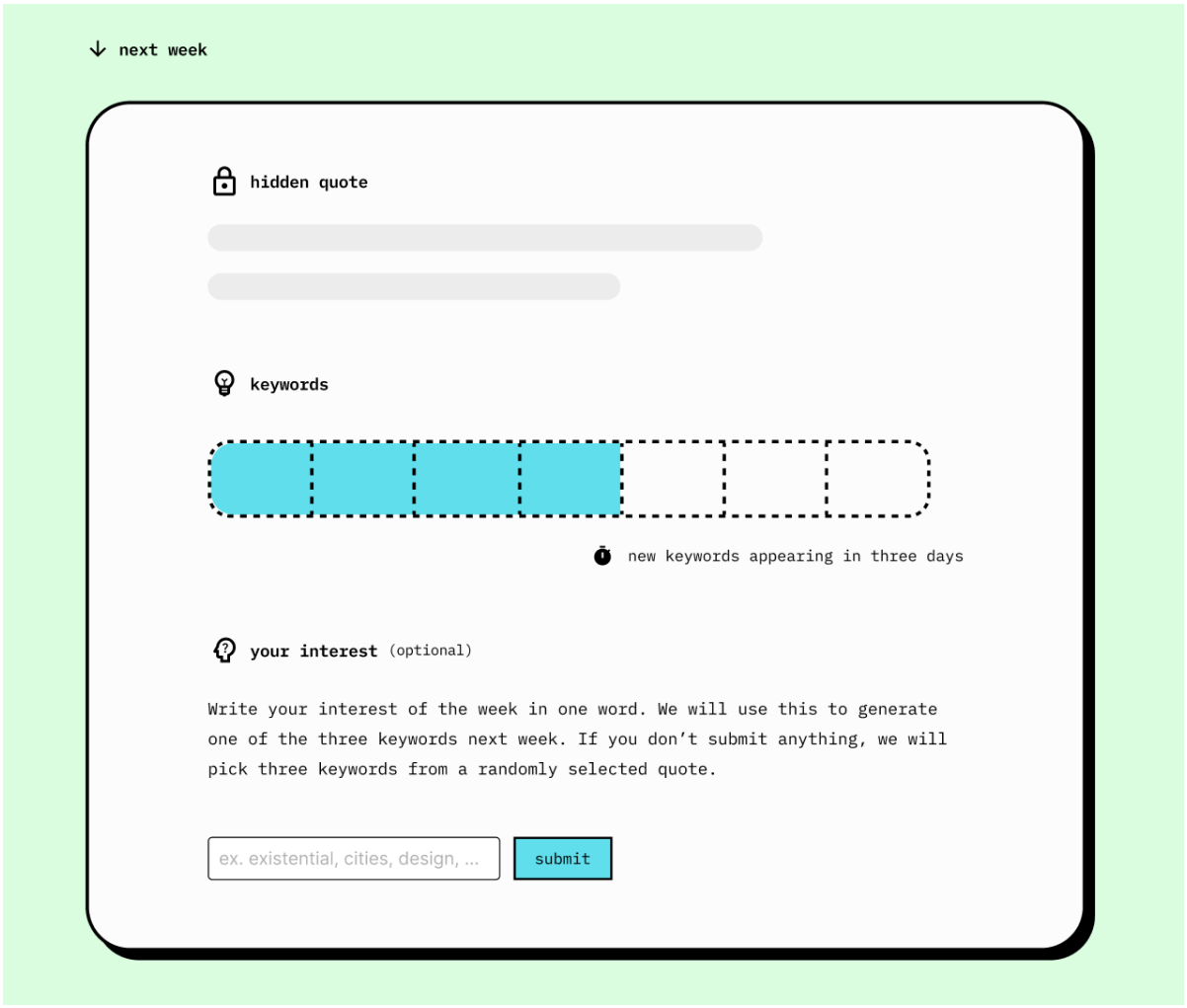


Figure 5: The "Next Week" Block. This block contains three elements. The first is a placeholder for the hidden quote that will be revealed after the user submits a response in the following week. The second element visualizes the number of days left before the new keywords appear, which are indicated through uncolored white boxes. The last element is the "interest of the week" feature.

study was approved by the University Research Ethics Board, and all participants provided informed consent prior to participation.

While defining "avid e-book readers" is inherently challenging, we used self-identification combined with a minimum threshold of 100 highlights as our screening criteria. All participants self-identified as avid e-book readers and have used e-readers—Kindle and Kobo—or other e-reading applications—Readera, Millie, etc. Their archive of e-books had exceeded the minimum screening criterion of 100 highlights across all books, and each participant's data entirely or mostly consisted of highlights from e-books written in English. For additional details on each participant's profile, see Table 1. In cases where their e-reading software does not allow users to export their data, we went through a process of manually transferring their data. After the conclusion of the field study, 5 participants reported that they primarily interacted with Quologue through their mobile device, while 4 participants interacted through the web. One participant used both platforms equally. In this paper, we use pseudonyms to describe participants to protect their identity.

We conducted three rounds of interviews with each participant over a secure video conferencing application Zoom during the eight-week period of this study. In our first meeting with the participants, we provided a demo of the interface to explain the core functionalities of Quologue. We also guided participants on how to display the Quologue app through their mobile phone, giving them the flexibility to engage with both the mobile and the web versions as needed. The initial interviews, which lasted between 40-60 minutes, were aimed to understand their practices of e-reading and annotation and their perception of their e-book collection and personal metadata stored in an e-reader or an application. After four weeks since the initial interviews, we had a check-in interview for

Table 1: Participant Profiles

Participant	Suman	Luna	Eric	Nelly	Harper
Age	20-24	20-24	20-24	20-24	20-24
Gender	Woman	Woman	Man	Woman	Woman
Country	Canada	Canada	Canada	United States	Canada
E-reader/ app	Kindle	Kobo	Kobo	Acrobat	Kindle
Genre	Fiction & Non-fiction	Fiction (Fantasy/Sci-fi)	Fiction (Fantasy/Sci-fi)	Non-fiction (Self-help)	Fiction (Fantasy/Romance)

Participant	Patrick	Sophia	Jackson	Quinn	David
Age	25-29	25-29	30-34	30-34	60-64
Gender	Man	Woman	Man	Woman	Man
Country	Canada	United States	Canada	Canada	Canada
E-reader/ app	Millie	Kindle	Kindle	Readera	Kindle
Genre	Non-fiction (Humanities)	Fiction (Fantasy/Romance)	Non-fiction	Non-fiction (Self-help)	Fiction (Historical fiction)

30-45 minutes to learn about participants' early-stage impressions on the core functionalities of Quologue and their daily lives and practices surrounding Quologue.

As the participants reached eight weeks of interacting with Quologue, we conducted the final round of in-depth interviews. We aimed to probe Quologue's role in fostering reflective experiences and recalling of memories that were tied to their digital traces on e-books. We were also interested in learning about any changes in their e-reading habits and whether they encountered any unexpected patterns or discoveries while interacting with their personal e-book data on Quologue. These final interviews lasted 60-90 minutes. We video-recorded all interviews, which were around 22 hours in total, and used the audio files from these recordings to transcribe the data. Though our system collected the data of participants' interactions with Quologue—keywords, responses, remixes, highlights, & system logs, our analysis directly drew only from the interview transcripts for analysis since participants could review their own interaction history and narrate it during the interviews.

Analysis of the data was an ongoing process. After each round of interview, we conducted preliminary analysis searching for emergent, stabilizing, and shifting patterns across our data to draw out underlying themes [62]. The interview transcripts were then coded by two members of the research team, using a hybrid approach involving first deductive and then inductive coding. With inductive coding, we examined the participants' interview transcriptions without predefined categories, identifying key quotes and forming themes based on recurring ideas. For deductive coding, we applied predefined categories, such as "perceptions of e-book highlight data" and "perceptions of slowness" to identify quotes and data that fit these existing themes. We held bi-weekly meetings that lasted 2-4 hours over a ten-week period to review and discuss themes in our analysis. We also created affinity diagrams to model connections and differences among participants. Ultimately, this process yielded five main themes— 1) discovering creative potential in keywords over time, 2) reflective experiences from re-encountering e-book data, 3) layered meaning-making experience from co-creation, 4) challenges in interpretation, and 5) changes in e-book digital highlighting practices. For readability, we consolidated these themes into three subsections in the Findings section—4.1 (theme 1), 4.2 (theme 2, 3, 4), 4.3, (theme 5).

4 FINDINGS

In this section, we present examples taken from the interviews that best illustrate how Quologue mediated people's experiences of reflection on memories and their e-book data archive and its impact on their digital reading practice. To better contextualize our findings, we provide a brief overview of participants' perception of their existing digital reading practices with their e-reader or application. Participants generally believe their e-book highlights are digital traces with personal meanings attached to them, as 8 participants explicitly reported that they believe their collection of highlights could reveal aspects of their personality such as their core values (**Quinn**, **David**, & **Patrick**), sense of humor (**Luna** & **Harper**), sociability (**Sophia**), or likes and dislikes (**Suman**, **Jackson**). Despite having a personal connection to their highlights, participants noted that the lack of visibility of e-books makes it difficult for them to engage with compared to print books, which echoes the findings from Gruning's work [33]. Here, **Luna** mentions that the scale of her e-book archive continues to grow, presenting challenges in maintaining awareness of the e-books she owns in the long term.

> "In terms of owning an e-book copy because there's less visibility with it, so I sometimes even forget which books I own until I go through the list of the books and be like, 'alright, I bought this like a while back on sale.' [...] So it's just a bit of a struggle with the e-books and now I'm getting to such [a large] number

> of e-books that I'm thinking I should start organizing them into shelves or something." (**Luna**)

We also found that the issue of visibility is not only limited to the e-books but also applies to the design of the interface that allows users to freely visualize and access their annotations. Participants expressed frustration over not being able to have a visual awareness of their highlights in one view. Since highlights are often scattered across different books, and depending on the interface they use, it may not support a feature that allows them to display all highlights at once. **Sophia** reported that not being able to visualize the entire collection of her highlights from different books on a Kindle was frustrating for her reading club sessions.

Participants who use other applications also experience similar restrictions when it comes to managing their metadata. For instance, **Quinn**, an experienced programmer, had to prepare and parse her metadata from the e-reading application Readera to participate in this field study. In the process of making **Quinn**'s data more interactive and manipulable, there was a barrier which might have been hard to overcome if the user was not already equipped with programming skills. These exemplify the limitations in their interface that act as obstacles to develop a collective awareness of their collections of e-books and annotations in the long term.

Next, we present findings that detail the trajectory of experiences participants had based on participants' accounts of living with Quologue throughout our field study.

4.1 Uncovering creative potential in the use of keywords over time

In the earlier weeks of the study, we found similarities in participants' ways of making use of the keywords though there were no pre-made guidelines given to participants regarding how they should engage with the keywords. They expressed an interest in guessing which highlight or the book the keywords for the week are sourced from. In the following quote, **Luna** compares her interactions on Quologue to solving "puzzle[s]" where she uses the keywords as hints.

> "Every time [I saw the keywords], it was me trying to recall what kind of quote it was. It was almost like a little puzzle. [...] It was always interesting to see what the hidden quote was. Especially after I had some hints towards [what] it might be." (**Luna**)

Notably, we discovered that as participants approached later weeks of the study, they increasingly began to experiment with various creative ways of appropriating keywords. In the case of Eric and Quinn, they also started out in the first half of the study by guessing what their highlight might be through the keywords they received. During the final interview, Eric recalled an instance of how he drew inspiration from his recent reading of another book in the latter half of the study. This inspiration influenced the manner he engaged with the keywords in the particular week, resulting in the creation of a short story.

> "My more recent [interaction is with] this one with 'existed,' 'never,' and 'time.' I sort of took those words and then wrote like a very short speculative story. [...] The reason I did this, I think, is because I'm reading another book right now, [which]] is Terra Ignota by Ada Palmer, [...] and that has a narrator with a very strong voice [...] who talks about what they're thinking, and you can really tell their personality through it. So, that might have inspired me to be like, 'Okay, what if time never existed? Who's the type of person who would be saying that? How would they be writing this?' So, there I was getting more experimental I think with what these words could mean, where they'd be coming from, who would be saying it and less trying to guess what the original highlight was from." (**Eric**)

Quinn also went through a similar progression in her experiences with the keywords. During a mid-study check-in, she indicated that she wants to engage with the keywords in more creative ways to see its effect on remixes.

> "In the latter half of the study, to be honest, what I want to do is experiment more with the system. [...] I'm going to put in this keyword that I don't think has anything to do with my annotations, and I'm going to make a totally far out response that might not have anything to do with the original highlight because I want to see how the remix happens." (**Quinn**)

She reflected back on her experience in the final interview, noting that:

> "In the earlier weeks of the study, I think I was trying to match what I had highlighted [in my responses]. So, I really tried to consider what that hidden original quote was because I really wanted to try and respond as closely as possible to it. [...] Whereas, now my responses became a bit more unhinged and creative. [...] I'm just going to try and type in what comes to mind. So, there was definitely a lot more creativity in the later weeks." (**Quinn**)

However, there were also cases when the generated keywords led to frustration when they did not accurately capture participants' authentic experience of the original text. Here, **Harper** recalls:

> "I remember reading a book recently, and I remember highlighting a big passage. And I wonder[ed] what keywords Quologue would [generate] if this was the highlight that I was being asked to guess. I wasn't really sure how I felt at that moment, but I think I was a bit irked. [...] I just felt like the keywords that were being given don't reflect the actual spirit or the point of it." (**Harper**)

While this was not a critical flaw in the system, it did pose challenges in an interpretative sense, highlighting the difficulty of aligning automated keywords with the nuanced understanding from their past reading experiences.

To sum up, there was a noticeable shift in participants' motivation in using the keywords. Though some tension arose from participants' perception of certain keywords, in general, the minimal design of keywords provided space for participants to infuse their own interpretations. In the first several weeks, they were more likely to focus directly on the original highlight, striving to

adhere to its intended meaning in writing their response. However, after they became more familiar with the system, they were increasingly guided by their own personal context and creativity, leading to their discovery of new creative ways to use keywords that were initially unclear or unknown.

4.2 Varying reflective experiences triggered through Quologue

Throughout the study, participants shared descriptive vignettes of how Quologue mediated their memory-oriented reflections through revisiting their e-book highlights. These encompass a range of experiences from recent to more distant past experiences. For instance, **Eric** recalls that when the highlight was revealed, it triggered memories of his personal experiences from the past when he first created the highlight.

> "[Interacting with Quologue] reminded me of weirdly not the context of the passage and the book itself but the context of my life, while I was reading the book, like where I was, what I was doing. […] I can tell you like the stretch of time that I was reading it. I was usually reading at work when there was downtime or on the bus to and from work. […] There's a lot of like, moments in my life that are coming back to me, just from knowing that this is a highlight from the book, and the themes that it's discussing. So, it really influenced, I think, my feelings and the way I went about my life during that stretch of time. About resilience, pushing through hard times. Like realizing who you are. […] Which I think is similar to how I listen to music. […] whenever I hear a song from [my album], I'll be instantly transported to the point that I was in my life when I was listening to it, and how I was feeling at that point." (**Eric**)

Interestingly, Eric compares the experience of revisiting his highlights as listening to music in his album, feeling instantly transported back to his past. Similar to music, e-book highlights primarily seem to evoke his personal associations rather than being about one's direct creation of content such as photos.

Sophia, on the other hand, used the interest of the week feature to incorporate the element from her recent past experience. In this quote, Sophia discusses how her recent visit to the botanical garden influenced her motivation behind putting the word "nature" for the interest of the week.

> "I went out to a botanical garden the weekend before, so nature was really on my mind for that week because I was just in awe of how beautiful the gardens were. […] I kind of felt immersed in nature at the time, so that's why I kind of wrote it into my response on this one. […] I think Quologue just incorporates something I did in real life and something I've done digitally like reading e-books." (**Sophia**)

Sophia's choice of the word, inspired by her recent experience, exemplifies how Quologue was used to connect participants' real-life experiences with their digital archive. By using this word in the response during the following week, she effectively bridged her physical experience with digital engagement. This integration is particularly noteworthy since as earlier accounts of participants' experiences with their existing e-reading applications show, their e-book archives often remain underutilized due to their limited interactivity.

Participants also had reflective experiences through their action of writing and interpreting the system output. For example, in this quote, Nelly describes the experience of encountering a parallel she found in the response she wrote and her highlight (see Figure 6):

> "When I was writing this response, I was very depressed, and it reflected on my life at the moment. [After the original highlight was revealed,] I thought that, again, I was incredibly blown away by how beautiful the writing of the highlight was. And I think it's interesting that the highlight and my response both show an imagery of the ocean to describe the loneliness [I felt]." (**Nelly**)

This quote shows that Nelly experienced layers of self-reflection by interacting with Quologue. First, through connecting the keywords into a response, she realized her response was representative of the emotional state at the moment. Then, she haphazardly discovered a similarity in the way her response and the highlight connect the words, which, in turn, enhanced her appreciation of the literary text she highlighted in the past. Nelly's engagement was not merely with the text but with herself, catalyzed by the sequential components on Quologue that allow personal experiences to shape and be shaped by literary materials.

Similarly, Quinn remarks that the sequential experience on Quologue helps her slow down and reflect over an extended period of time, compared to traditional e-reading platforms.

> "I think it was just maybe like a good exercise to make you stop and think to maybe 'earn the quotes.' […] I think it goes back to that process of slowing down, reflecting, and making meaning. […] You can pull up your annotations list and probably read the quote anywhere, but in this sense, this whole process of writing the response and thinking about the keywords, and then seeing the quote, makes you slow down and sit and think, 'Okay, what have I been reading? And how might this quote have taught me something for me to be able to respond in the way that I want to with the keywords?"' (**Quinn**)

In **Eric**'s case, reading the original highlight alongside his response prompted him to interpret that the greater semantic difference between the two comes from the temporal gap between the present moment and the time when he first created the highlight.

> "I could see if these quotes [surfaced] immediately after I had highlighted something, [my response and the highlight] could be more similar because I could recognize the themes that I'm specifically thinking on at the time because I'm still thinking about them. But I think because of how distanced I am from when I was highlighting these, that's sort of where the more drastic change comes in. I'm not actively thinking

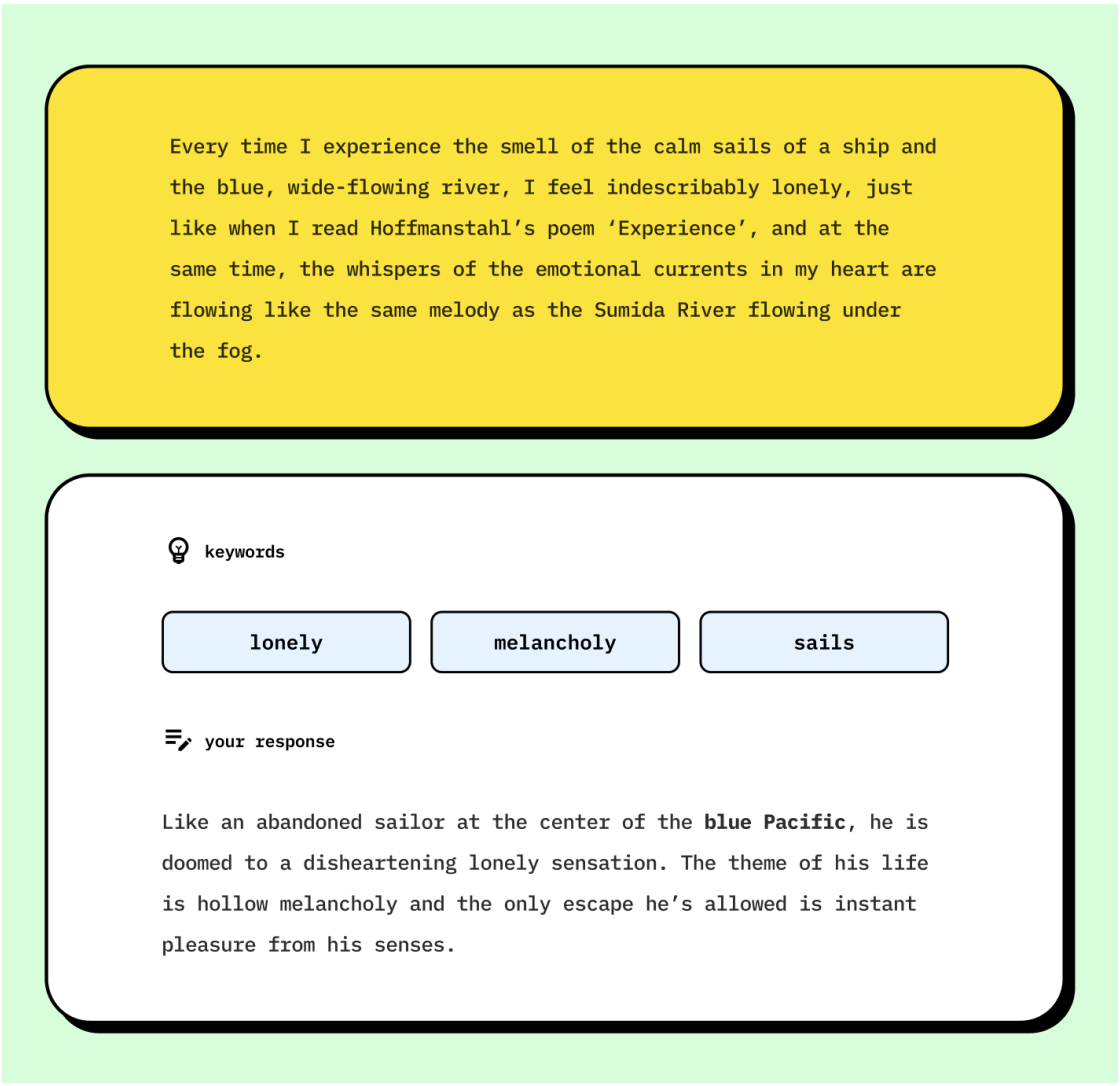


Figure 6: Nelly's interactions with Quologue. The text in the top yellow block shows Nelly's highlight which generated the three keywords, "lonely", "melancholy", and "sails". The response she submitted is shown in the white block under the keywords.

> about all this stuff anymore because I'm reading different things. I'm thinking about different themes." (**Eric**)

Participants like **Suman**, **Luna**, **Patrick**, and **Sophia** specifically noted that they had positive experiences with remixes. Here, **Nelly** mentions how she appreciated the remixes prompted reflection and personal engagement:

> "I think [Quologue] feels a little more personal because your writing and the quote produce another piece of writing, so it's a more personal engaging experience. [...] For example, if the highlight is more of an advice, and your response is more of a personal life kind of thing, and when you remix them, you might be able to reflect on your life in a different light. [...] I like knowing whenever I make highlights that I might be able to interact with it, put in my own thoughts into it." (**Nelly**)

Likewise, **Sophia** shared how one of her remixes resonated with her life experience and provided encouragement. Her remix read: "Although the smog made it hard to breathe, hope was the anchor that kept me going. It was the lifeline that helped me push through each challenging day. The belief in a brighter future sustained me when everything else seemed bleak." Upon reading this, **Sophia** remarked,

> "[This remix] just reminds me of my mental health struggles, and I know it's going to get better even though everything seems dark and pressing. It just helps me push through every day." (**Sophia**)

However, in some cases, participants remarked that the tone of remixes did not match their expectation of when they wrote the response. For instance, **David** shared:

> "The remix is a little bit extreme. Maybe because of what I wrote, which was a little bit ridiculous to start with. [In the response, I wrote,] 'something about a bustling marketplace will get your blood pumping fast.' And it turned into [this remix]: 'the marketplace should be your go-to destination for a quick adrenaline rush."' (**David**)

Remixes often led to interesting moments of personal reflections, and participants' feedback indicated a more nuanced control over the tone rather than a rejection of the feature.

These examples collectively show that participants engaged in interesting reflections on both recent and more distant past experiences, initiated by a range of different elements on Quologue. These included the revelation of the original highlighted text and its source, the selection of a word that primed the Quologue experience for the following week, and the meaning-making experiences with their input and output.

4.3 Changes in digital highlighting practices

After spending weeks of interacting with their e-book highlights on Quologue, several participants—**Quinn**, **David**, **Suman**, and **Nelly**—explicitly reported that they have become more thoughtful and strategic in the way they highlight with their e-reading applications after interacting with Quologue. For brevity, we share only a few illustrative excerpts here. In the final interview, **Suman** shared a specific anecdote from when she was reading another e-book, during which she noticed changes in her highlighting behaviors.

> "The other day, I was using a Kindle, and I was reading. I guess that thought kind of crossed my mind, as I was about to highlight something. But then, I realized how useless the quote was, and I ended up not highlighting it and highlighting something else. I'm also just making the quotes a bit longer, too. I noticed that helps a lot because it gives more context to the quote." (**Suman**)

When highlights are exported from their usual e-reading service to external software such as Quologue, the context of the highlight is no longer directly available. It shows that **Suman** adapted to this change by a new strategy where she highlights longer parts of a passage than usual to include more context when she revisits these in the future.

Quinn, on the other hand, mentioned that she would consider the relations between different highlights, which she admits to not considering prior to living with Quologue:

> "If I was to reread [books] again, after using Quologue, then I would definitely have a different perspective of thinking about maybe the relations I have between the different quotes that I'm highlighting, which I haven't really thought of before. [...] Maybe then I would just be more mindful of what I am highlighting and more interested in thinking of, 'what are these different types of quotes that are there in this book that might have some sort of lesson or some sort of information?"' (**Quinn**)

Similarly, in Nelly's case, she inferred a new insight about her e-book highlights by becoming aware of the pattern in the data she interacted with over the weeks:

> "I think I did realize how serious my highlights can be. Whenever I see the highlight that Quologue has chosen. There's not a lot of whimsical ones, and so the remix tends to be very serious. And I think it does reflect on my personality, but it makes me want to highlight quotes that are a little bit more whimsical as well." (**Nelly**)

Noticing that the highlights she interacted with on Quologue tend to have a serious tone, **Nelly** wishes to leave more digital traces that could show a more underrepresented part of her personality. She also notes that there was a shift in her attitude from a more casual to more purpose-driven when it comes to highlighting.

> "Now when I read e-books and make highlights, sometimes I think about how this could be utilized in the app. So, sometimes I get pickier with the quotes that I highlight. Also, sometimes I highlight quotes that have really beautiful phrases that might make it in the remix of Quologue. [...] I feel more attentive to the highlights I make. There's more of a purpose behind it. Instead of it being like, 'oh, there's a nice quote."' (**Nelly**)

These narratives show that as participants lived with the Quologue system over the weeks, it influenced their current e-reading practice. This was evident in their highlighting behaviors—both in what they choose to highlight and how they approach the task. These changes adapted to the context of a repurposed system where they could engage in more creative interactions with their personal metadata.

5 Discussion and Future Directions

Prior research [33, 46] and our own findings show that current e-reading infrastructure limits people's ability to develop deeper awareness of their e-book annotations. As our study illustrates, personal e-book data—when restructured and made interactive—can serve as valuable material for reflection, contemplation, and meaning-making. Specifically, we found that stepwise engagement with keywords derived from e-book highlights offered participants a novel way to revisit and recontextualize their reading data. Our work extends the original vision of slow technology [35] by introducing a dialogical model of interaction with generative AI, in which the AI first produces creative material and users then respond, evolving the system's outputs through their own reflective input. This interaction supports deeper engagement with personal data situated in life history. In what follows, we outline future opportunities for HCI research and design practice informed by these findings.

5.1 Reimagining e-reading as a lifelong practice to build personal meaning with metadata

The design of conventional e-reading infrastructure has often been optimized for single-session interactions, by prompting users' information access and retrieval [1, 11, 51]. This emphasis has resulted in fragmented interactions with text, limiting opportunities for deeper meaning-making [55, 60]. Additionally, annotating within e-books appears to offer only minimal benefits for comprehension when compared to annotating in physical books [5].

Our study revealed a meaningful opportunity for e-book users to reflect on different moments in their personal history by actively engaging with their archived metadata. At the outset, participants acknowledged that their e-reading metadata carried some personal significance, but existing e-reading infrastructure imposed clear limitations that prevented deeper engagement with this data. As participants encountered highlights from their past and interpreted the keywords generated each week, they began uncovering new personal insights and nuances. For example, Eric (Section 4.1) reflected on a past highlight from a new angle by writing his response in a narrative style inspired by another book he was currently reading. In Nelly's case (Section 4.2), she uncovered an emotional resonance between a past highlight and her present state through the act of interpreting keywords. These kinds of insights would likely have remained hidden in a conventional annotation interface that merely allows users to scroll through an archive. By engaging with their e-reading data over an extended period, participants developed a deeper, more reflective understanding of their reading practices.

When contrasted with conventional e-reading devices and systems—which retains user metadata within the original textual and temporal context—our findings reveal the generative potential of an alternative infrastructure that supports long-term meaning-making. Through Quologue, participants constructed personal meaning via an ongoing dialogue between past highlights, present experiences, and the evolving self. This relational model of interaction, in which users actively contribute new text in the present, builds on and extends earlier research into design artifacts that leverage temporal metadata for self-reflection with media such as digital photos or music [13, 14, 17, 71, 106]. However, unlike music or photos, text—being highly mutable and easily revisited—offers distinct affordances for personal creative expression. It enables users to continually reshape their relationship with archived data over time. In this context, "coherence," defined by Mekler and Hornbæk's framework of meaning in HCI [61] as "the extent to which one's experiences make sense," was a key dimension that was supported by Quologue. We can clearly see how the system allowed participants to make sense of their temporal fragments from personal and reading histories in relation to one another. Through this process, users can develop more nuanced understandings of their data and construct personal narratives that synthesize previously disjointed timepoints from their reading archive.

Our findings also provoke the question of how such dialogical data encounters might scale over a lifetime and, in doing so, introduce new motives and changes to current digital practices. In our study, participants who continued reading new e-books while living with Quologue (see section 4.3) reported that they began anticipating how they would use new highlights later on Quologue. This shift reflects the "purpose" dimension of Mekler and Hornbæk's framework [61] where participants developed clearer short-term goals in their highlighting behaviors that aligned with the higher-level aim of wanting to have more personal connection to the e-book highlights data. For example, in 4.3, Nelly reflected on her data reflecting her personality only partially from the remixes she co-created with Quologue. This newfound perception prompted the desire to change her future digital reading practice so that the collection of her highlights is more 'representative' of her perceived self-identity. In this way, our work takes a modest step toward suggesting opportunities for future work to explore how users might be encouraged to reinterpret their metadata archives in ways that support digital practices in the long term.

Taken together, our findings highlight new design directions for e-reading systems that move beyond archival utility toward supporting longer-term, ongoing meaning-making, creative expression, and identity construction. For example, rather than treating annotations as static remnants of past sessions, our findings suggest the value of designing systems that engage users in an ongoing dialogue with their past selves. By periodically resurfacing prior highlights in relation to the present—through prompts, narrative framing, or mood/context alignment—future e-reading platforms could facilitate reflective encounters across time. These systems might adopt metaphors such as time capsules, echoes, or memory remixes to foreground reading as a cumulative and evolving practice. Additionally, participants' remixing of past annotations revealed how metadata can be reframed as expressive material, enabling meaning to be re-authored in the present, in some instances as a form of a collaborative product with the original writer or as an emotional support (e.g., Nelly & Sophia in 4.2). This suggests an opportunity for designers to support creative transformations of annotations into new formats—narratives, dialogues, poems, or visualizations—that allow users to engage with their archives as co-authors rather than passive readers. Such tools could position metadata as a generative foundation for storytelling, therapeutic reflection, or speculative writing, expanding how users make sense of their reading histories. Finally, the fact that some participants began to read differently—more intentionally—when anticipating future engagement with their data underscores a shift toward post-e-reading practices. Future design initiatives could support this by building in options that extend annotation practices to be more anticipatory, curatable, and self-representative. Features such as longitudinal visualizations of emerging themes, identity-aware highlight tagging, or AI-supported reflection could help users track and shape the trajectory of their reading and thinking over time. Future work in this direction can support a reframing of e-reading not as a finite task, but as part of a longer narrative arc of self-understanding.

5.2 Revisiting the value and use of e-books with new affordances

Our findings highlight a potential direction for future research that builds on and extends ongoing research into people's valuation of their digital possessions [18, 72, 73, 77]. If e-books are augmented with generative AI to encourage users to discover new affordances of e-reading infrastructure based on their personal desires and

context over time, can this lead to valuing their e-books more? Practical factors, such as people's income level and the number of books they own, can influence how likely they are to adopt e-books [105]. Nevertheless, e-books lack the visibility in people's daily lives that physical books have, and it leads to people having a reduced sense of ownership and personal value attribution [33]. This gap in perceived value presents an opportunity for e-reading services to consider other dimensions of users' personal goals.

It is clear that there were gradual changes in how participants made use of keywords generated from their e-book data based on their desires and context over time, which signals a significant shift. During the earlier weeks of the study when participants engaged with the keywords in a more straightforward way, i.e., to guess the book or the highlight the keywords were sourced from, as shown through **Luna**, **Eric**, and **Quinn (**in section 4.1). As participants became more familiarized with the Quologue system, they began to implement more elaborate and playful ways to appropriate their data and our system (see Eric & Quinn's anecdotes after eight weeks of usage in section 4.1). In this way, our participants' respective roles shifted from passive users who have highly limited control on their own data to active producers that create new personalized ways of using their e-book data as they grew more familiar with Quologue. This transformation demonstrates how algorithmic curation can scaffold increasingly creative forms of personal data encounters, expanding the conventional reader-text relationship into a more complex ecology involving layered encounters and algorithmic intervention. However, this tendency of experimental use might have been more pronounced by this specific population's interest in e-reading and the willingness to interact with an experimental interface over extended periods. This hints that the quality and degree of engagement might also depend on users' personal motivations. While our findings emerge from this specific population, they point to broader implications for how e-reading platforms might construct greater value in digital books.

According to Denegri-Knott et al. [18], people's perceptions of how they can use digital possessions to accomplish their identity-related goals (e.g., being self-expressive) could influence how they value the digital possessions. Current e-reading services, however, have largely overlooked opportunities to support creative self-expression. If e-books are augmented with generative AI to help users discover new ways to creatively express themselves with e-book metadata, as in the case of Quologue, this could potentially influence how users perceive the value of their e-books. Future research can investigate relationships among users' identity-related goals, their long-term engagement with such applications, and how these factors collectively impact their valuation of e-books over time. For example, users who prioritize self-expression may be more willing to experiment with their annotations, exploring various ways to use them to support their creative goals. This deeper engagement could potentially lead to differing valuations of e-books, as individuals with stronger motivations for self-expression might come to value their e-books, or the data within them, more than others.

Building on this insight, we see an interesting gap in current e-reading literature. Although prior research [95] has examined how different types of readers' motivation influence e-reading behaviors, the approach of building and testing a new design artifact to actively stimulate these motivations has been underexplored. Future research could pursue a more comprehensive study of individual differences in reading motivations and investigate how a design artifact like Quologue, which surfaces personal metadata, might interact with and support those motivations.

In summary, to construct greater value and support richer uses of e-books, we see an opportunity to investigate how other dimensions of personal identity-related goals might be introduced in the design of more dynamic and generative e-reading systems, marking clear territory that has largely been overlooked to date. Building on previous research on reimagining the practice of digital reading [23, 58, 59], our work contributes to conceptualizing e-books and e-readers not as mere digital replicas of physical books but as vehicles for reconfigurable reading experiences that transcend the affordances of paper.

5.3 Designing alternative forms of LLMs for slow interactions

Our study identified two key factors in the design of Quologue that appeared fundamental to shaping their desire for long-term, ongoing reflective experiences. First, the interaction tactic of intentionally hiding the original context of users' metadata and generating low-granular output was effective for provoking more curiosity and thought regarding the text and the readers themselves (see examples in 4.1). While slow technology artifacts [7, 14, 93] have previously employed the strategy of producing low-granular output to encourage reflections, our approach is novel in applying this to text-based e-book highlights data, extending this strategy beyond well-explored domains such as digital photos, videos, and music listening histories. Acting as easy entry points for reflection, the keyword design was helpful in addressing challenges identified in prior personal informatics research [52], where users often fail to reflect on personal data because they lack the time to do so, have difficulty with the intelligibility of the information, or the act of reflection requires cumbersome curation and management labor. There is an opportunity for future research to leverage the use of ambiguity for LLM interactions, which diverges from the more commonly used chatbot format for LLM systems that aim to mirror real-world conversations.

Second, we found that the Quologue system enabled participants to have deeper engagement with a single highlight from their archive through an extended, stepwise journey. **Sophia** (4.2), for instance, notes that this stepwise journey on Quologue allowed her to integrate elements of her personal life into her e-book data. The extended timeframe of interacting with the e-book metadata also encouraged users to "earn the quote," as Quinn described (in section 4.2), making the reengagement with their metadata highly personalized through the use of an LLM.

On a practical level, for designing an artifact that aims for deep personal engagement with one's metadata, HCI researchers and practitioners can employ these two interaction tactics, using an LLM to invite active meaning-making experience. Specifically, to spark curiosity about personal textual data, LLMs can introduce ambiguity, enabling users to form new connections with the system output. Then, users can go through a stepwise journey where users are asked to contextualize low-granular output over an extended

period. These interaction design tactics introduce new opportunities for users to actively mix in personal elements to their metadata that could otherwise remain impersonal in a conventional digital archive. As we observed, it is possible to encounter issues regarding the low-granular output occasionally not being able to accurately capture original experiences (see Harper's reflection in section 4.1). However, these differences in the ways users contextualize low-granular text output in the present moment were also key to rich reflective experiences that spanned from their pasts to present. There is a clear opportunity for future research to extend beyond e-book annotations to other forms of personal textual data, such as messages, journals, and emails.

There is a growing body of work that explores the alternative potentialities of AI systems by highlighting the mysterious, ineffable qualities of the output. These efforts include creating a tarot card deck with generative AI [57], making a design probe for visualizing dreams with generative AI [8], using an LLM "hallucination" for visual storytelling [36], and playfully reproducing one's images through generative adversarial network (GAN) techniques [4]. These works encourage users to have open-ended interpretations of AI outputs. However, leveraging LLMs as tools for navigating personal digital archives to promote rich reflective experiences is surprisingly underexplored. Most existing slow technology artifacts [66, 68, 93, 100] have largely examined ways to effectively surface one's metadata from large digital archives, but our work extends a novel approach to connect with one's digital past in alternatively engaging ways by co-creating with an LLM than merely surfacing it. While the remixes often promoted personally meaningful reflections, in some cases, participants desired more control over the tone of the output (see 4.2). This finding presents an opportunity for future research to explore how personal data might be presented through different tones—such as symbolic, surreal, or exaggerated language—at varying levels of granularity to trigger rich introspection and enhance user engagement in co-creating with an LLM. Such an approach echoes calls in HCI literature for more nuanced user agency in creative AI systems [25, 63, 89], and interaction frameworks, such as AI chains [102]—segmenting a larger LLM system into more controllable, smaller components, could help address this need.

Additionally, we see the potential of using LLMs to help one notice changes in oneself over time hinted at by Eric's anecdote (in section 4.2). When he noticed comparatively significant semantic differences between his response and the original highlight, he attributed this to the amount of time passed since he initially marked the highlight and the shifts in his interest over the period. LLM systems that collect user text inputs over time, as in the case of users' responses on Quologue, have the potential to capture representations of the user at each interaction. We envision that such applications could potentially help users reflect on their cumulative changes and the passage of time. For instance, an LLM-integrated journaling application could periodically update past journal entries by incorporating new text that connects them to more recent entries, aiming to encourage users to reflect on these connections within their personal history. Unlike the common implementation of LLM systems that rely on direct user input during interactions, this feature could operate in the background and potentially serve as a subtle, indirect indication of the temporal gap between one's past and the present. Future research could explore how this type of application might help users reflect on how their perspectives or experiences have evolved over time through such established and emerging textual interconnections. Clearly, however, it will be crucial to critically consider balancing boundaries of social acceptability around system autonomy and user control.

6 Conclusion and Future Work

Through the design and field study of *Quologue*, we explored how generative AI can act as a resource for surfacing and re-encountering personal e-book metadata in ways that conventional annotation systems do not support. While our participant pool was limited to North America and composed of self-identified avid e-book users—a clear constraint—our findings offer important insights into how digital reading infrastructure might evolve to support richer, more personally meaningful engagements with reading data. Future studies could extend this work to readers in diverse cultural and geographic contexts and with varying degrees of familiarity with e-reading platforms. Our findings suggest that Quologue's recurrent keyword-based, stepwise interaction model offered interpretive flexibility, which participants used as a creative prompt to revisit and recontextualize past highlights. Over time, participants moved from passive reflection to more active forms of authorship and adoption. This shift was accompanied by more mindful and intentional e-reading behaviors, such as highlighting with an eye toward future reinterpretation. These evolving practices were scaffolded by the system's capacity to support multiple modes of engagement across time, including structured reflection, narrative remixing, and co-creation with AI.

Our work contributes (i) design insights on how to scaffold long-term, dialogical relationships with personal reading data; (ii) an alternative vision for e-reading infrastructure that values meaning-making over retrieval; and, (iii) an example of how generative AI might be repurposed to support situated, slow interactions with data that evolve alongside users' lives. More broadly, our work contributes to ongoing conversations in HCI and personal informatics about designing with data not as static records but as materials for ongoing interpretation, self-authorship, and identity work (e.g., [21, 26, 71, 84, 87, 107]). We hope this study inspires future research into how everyday data—particularly from creative and expressive domains like reading—can be reimagined as a site for reflection, connection, and continuity across time.

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References

[1] Maristella Agosti, Nicola Ferro, Emanuele Panizzi, and Rosa Trinchese. 2006. Annotation as a support to user interaction for content enhancement in digital libraries. In *Proceedings of the working conference on Advanced visual interfaces*, 2006. 151–154.

[2] Riku Arakawa and Hiromu Yakura. 2024. Coaching Copilot: Blended Form of an LLM-Powered Chatbot and a Human Coach to Effectively Support Self-Reflection for Leadership Growth. *ArXiv Prepr. ArXiv240515250* (2024).

[3] Jesse Josua Benjamin, Arne Berger, Nick Merrill, and James Pierce. 2021. Machine Learning Uncertainty as a Design Material: A Post-Phenomenological Inquiry. May 06, 2021. ACM, Yokohama Japan, 1–14. https://doi.org/10.1145/3411764.3445481

[4] Jesse Josua Benjamin, Heidi Biggs, Arne Berger, Julija Rukanskaitė, Michael B Heidt, Nick Merrill, James Pierce, and Joseph Lindley. 2023. The Entoptic Field Camera as Metaphor-Driven Research-through-Design with AI Technologies. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 2023. 1–19.

[5] Gal Ben-Yehudah and Yoram Eshet-Alkalai. 2014. The influence of text annotation tools on print and digital reading comprehension. In *Proceedings of the 9th chais conference for innovation in learning technologies*, 2014. 28–35.

[6] Annika Bergström and Lars Höglund. 2020. E-books: In the shadow of print. *Converg. Int. J. Res. New Media Technol.* 26, 4 (August 2020), 895–911. https://doi.org/10.1177/1354856518808936

[7] Kirsten Boehner, Phoebe Sengers, and Simeon Warner. 2008. Interfaces with the ineffable: Meeting aesthetic experience on its own terms. *ACM Trans. Comput.-Hum. Interact.* 15, 3 (November 2008), 1–29. https://doi.org/10.1145/1453152.1453155

[8] Sofie Krogh Bønlykke, Kamma Amalie Lind Madsen, and Tom Jenkins. 2024. Taking the bizarre seriously: dreams as a material for interaction design. In *Designing Interactive Systems Conference*, July 2024. ACM, IT University of Copenhagen Denmark, 699–713. https://doi.org/10.1145/3643834.3661562

[9] Ahmet Börütecene and Oğuz 'Oz' Buruk. 2019. Otherworld: Ouija Board as a Resource for Design. In *Proceedings of the Halfway to the Future Symposium 2019*, 2019. 1–4.

[10] Nico Brand, William Odom, and Samuel Barnett. 2021. A Design Inquiry into Introspective AI: Surfacing Opportunities, Issues, and Paradoxes. In *Designing Interactive Systems Conference 2021*, 2021. 1603–1618.

[11] Guillaume Cabanac, Max Chevalier, Claude Chrisment, and Christine Julien. 2007. Collective annotation: Perspectives for information retrieval improvement. In *Large Scale Semantic Access to Content (Text, Image, Video, and Sound)*. 529–548.

[12] Gina N Cervetti, Carolyn A Jaynes, and Elfrieda H Hiebert. 2009. Increasing opportunities to acquire knowledge through reading. *Read. More Read. Better* (2009), 79–100.

[13] Amy Yo Sue Chen and William Odom. 2021. Crafting temporality in design: Introducing a designer-researcher approach through the creation of Chronoscope. In *The Routledge International Handbook of Practice-Based Research*. Routledge, 368–380.

[14] Amy Yo Sue Chen, William Odom, Sol Kang, and Carman Neustaedter. 2023. PhotoClock: Reliving Memories in Digital Photos as the Clock Ticks in the Present Moment. (2023).

[15] Amy Yo Sue Chen, William Odom, Carman Neustaedter, Ce Zhong, and Henry Lin. 2023. Exploring Memory-Oriented Interactions with Digital Photos In and Across Time: A Field Study of Chronoscope. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, April 19, 2023. ACM, Hamburg Germany, 1–20. https://doi.org/10.1145/3544548.3581012

[16] Meredith Rogers Cherland. 1994. *Private practices: Girls reading fiction and constructing identity*. Taylor & Francis.

[17] Patricia Ciobanu and Oskar Juhlin. 2022. Me, the Hill and My Browser – Investigating the Role of Time in Posthuman Interaction. In *Nordic Human-Computer Interaction Conference*, October 08, 2022. ACM, Aarhus Denmark, 1–12. https://doi.org/10.1145/3546155.3546651

[18] Janice Denegri-Knott, Rebecca Jenkins, and Siân Lindley. 2022. Valuing digital possessions: the role of affordances. *J. Comput.-Mediat. Commun.* 27, 6 (September 2022), zmac019. https://doi.org/10.1093/jcmc/zmac019

[19] Audrey Desjardins and Aubree Ball. 2018. Revealing Tensions in Autobiographical Design in HCI. In *Proceedings of the 2018 Designing Interactive Systems Conference*, June 08, 2018. ACM, Hong Kong China, 753–764. https://doi.org/10.1145/3196709.3196781

[20] Audrey Desjardins, Heidi R Biggs, Cayla Key, and Jeremy E Viny. 2020. IoT data in the home: Observing entanglements and drawing new encounters. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 2020. 1–13.

[21] Audrey Desjardins, Jena McWhirter, Justin Petelka, Chandler Simon, Yuna Shin, Ruby K Peven, and Philbert Widjaja. 2023. On the Making of Alternative Data Encounters: The Odd Interpreters. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (*CHI '23*), April 19, 2023. Association for Computing Machinery, New York, NY, USA, 1–20. https://doi.org/10.1145/3544548.3581323

[22] Audrey Desjardins and Timea Tihanyi. 2019. ListeningCups: A Case of Data Tactility and Data Stories. In *Proceedings of the 2019 on Designing Interactive Systems Conference* (*DIS '19*), June 18, 2019. Association for Computing Machinery, New York, NY, USA, 147–160. https://doi.org/10.1145/3322276.3323694

[23] Lauren Dick. 2020. The enhanced ebook: Its past, present, and future place in the North American publishing industry. (2020).

[24] Hélène Edberg. 2018. *Creative Writing for Critical Thinking*. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-319-65491-1

[25] Hubert Ekvall and Patrik Winnberg. 2023. Integrating ChatGPT into the UX Design Process: Ideation and Prototyping with LLMs.

[26] Chris Elsden, Mark Selby, Abigail Durrant, and David Kirk. 2016. Fitter, Happier, More Productive: What to Ask of a Data-driven Life. *interactions* 23, 5 (August 2016), 45–45. https://doi.org/10.1145/2975388

[27] Muhamed Fajkovic and Lennart Björneborn. 2014. Marginalia as message: affordances for reader-to-reader communication. *J. Doc.* 70, 5 (September 2014), 902–926. https://doi.org/10.1108/JD-07-2013-0096

[28] Daniel Fallman. 2003. Design-oriented Human-computer Interaction. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '03*), 2003. ACM, New York, NY, USA, 225–232. https://doi.org/10.1145/642611.642652

[29] Cally Gatehouse and David Chatting. 2020. Inarticulate Devices: Critical Encounters with Network Technologies in Research Through Design. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference*, July 03, 2020. ACM, Eindhoven Netherlands, 2119–2131. https://doi.org/10.1145/3357236.3395426

[30] William Gaver. 2012. What Should We Expect from Research Through Design? In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '12*), 2012. ACM, New York, NY, USA, 937–946. https://doi.org/10.1145/2207676.2208538

[31] William Gaver, Andy Boucher, Andy Law, Sarah Pennington, John Bowers, Jacob Beaver, Jan Humble, Tobie Kerridge, Nicholas Villar, and Alex Wilkie. 2008. Threshold Devices: Looking out from the Home. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '08*), 2008. ACM, New York, NY, USA, 1429–1438. https://doi.org/10.1145/1357054.1357278

[32] William W. Gaver, Jacob Beaver, and Steve Benford. 2003. Ambiguity as a resource for design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, April 05, 2003. ACM, Ft. Lauderdale Florida USA, 233–240. https://doi.org/10.1145/642611.642653

[33] Jane Gruning. 2018. Displaying Invisible Objects: Why People Rarely Re-read E-books. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, April 19, 2018. ACM, Montreal QC Canada, 1–12. https://doi.org/10.1145/3173574.3173713

[34] Rebecca Gulotta, Alex Sciuto, Aisling Kelliher, and Jodi Forlizzi. 2015. Curatorial agents: How systems shape our understanding of personal and familial digital information. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 2015. 3453–3462.

[35] Lars Hallnäs and Johan Redström. 2001. Slow technology–designing for reflection. *Pers. Ubiquitous Comput.* 5, (2001), 201–212.

[36] Brett A. Halperin and Stephanie M Lukin. 2024. Artificial Dreams: Surreal Visual Storytelling as Inquiry Into AI "Hallucination." In *Designing Interactive Systems Conference*, July 2024. ACM, IT University of Copenhagen Denmark, 619–637. https://doi.org/10.1145/3643834.3660685

[37] Vivian Howard. 2011. The importance of pleasure reading in the lives of young teens: Self-identification, self-construction and self-awareness. *J. Librariansh. Inf. Sci.* 43, 1 (2011), 46–55.

[38] Annika Hupfeld, Abigail Sellen, Kenton O'Hara, and Tom Rodden. 2013. Leisure-Based Reading and the Place of E-Books in Everyday Life. In *Human-Computer Interaction – INTERACT 2013*, Paula Kotzé, Gary Marsden, Gitte Lindgaard, Janet Wesson and Marco Winckler (eds.). Springer Berlin Heidelberg, Berlin, Heidelberg, 1–18. https://doi.org/10.1007/978-3-642-40480-1_1

[39] Hilary Hutchinson, Wendy Mackay, Bo Westerlund, Benjamin B. Bederson, Allison Druin, Catherine Plaisant, Michel Beaudouin-Lafon, Stéphane Conversy, Helen Evans, Heiko Hansen, and others. 2003. Technology probes: inspiring design for and with families. In *Proceedings of the SIGCHI conference on Human factors in computing systems*, 2003. ACM, 17–24. Retrieved September 19, 2015 from http://dl.acm.org/citation.cfm?id$=$642616

[40] Kirsten Jack and Sam Illingworth. 2019. Developing reflective thinking through poetry writing: Views from students and educators. *Int. J. Nurs. Educ. Scholarsh.* 16, 1 (2019), 20180064.

[41] Sangu Jang, Woojin Lee, Beom Kim, William Odom, and Young-Woo Park. 2022. Encountering Cover Versions of Songs Derived from Personal Music-Listening History Data: a Design and Field Trial of Musée in Homes. *Interact. Comput.* 34, 1 (January 2022), 24–42. https://doi.org/10.1093/iwc/iwac027

[42] Denis Janiak, Jakub Binkowski, Albert Sawczyn, Bogdan Gabrys, Ravid Schwartz-Ziv, and Tomasz Kajdanowicz. 2025. The Illusion of Progress: Re-evaluating Hallucination Detection in LLMs. *ArXiv Prepr. ArXiv250808285* (2025).

[43] Genevieve Johnson and G Buck. 2014. Electronic books versus paper books: Pre-service teacher preference for university study and recreational reading. *Int. J. Humanit. Soc. Sci. Educ.* 1, 8 (2014), 13–22.

[44] Clinton Jorge, Julian Hanna, Valentina Nisi, Nuno Nunes, Miguel Caldeira, and Giovanni Innella. 2013. Fostering ambiguity: decontextualizing and repurposing a familiar public display. In *Proceedings of the Biannual Conference of the Italian Chapter of SIGCHI*, 2013. 1–10.

[45] Michael Nørgaard Jørgensen and Tom Jenkins. 2023. Designing Anekdota: Investigating Personal Metadata for Legacy. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 2023. 1–14.

[46] Sol Kang and William Odom. 2024. On the Design of Quologue: Uncovering Opportunities and Challenges with Generative AI as a Resource for Creating a Self-Morphing E-book Metadata Archive. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, May 02, 2024. ACM, Honolulu HI USA, 1–16. https://doi.org/10.1145/3613905.3650909

[47] Róisín Keane. 2012. Learning through creative writing. PhD Thesis. National University of Ireland, Maynooth (Ireland).

[48] Jan Kocoń, Igor Cichecki, Oliwier Kaszyca, Mateusz Kochanek, Dominika Szydło, Joanna Baran, Julita Bielaniewicz, Marcin Gruza, Arkadiusz Janz, Kamil Kanclerz, Anna Kocoń, Bartłomiej Koptyra, Wiktoria Mieleszczenko-Kowszewicz, Piotr Miłkowski, Marcin Oleksy, Maciej Piasecki, Łukasz Radliński, Konrad Wojtasik, Stanisław Woźniak, and Przemysław Kazienko. 2023. ChatGPT: Jack of all trades, master of none. *Inf. Fusion* 99, (November 2023), 101861. https://doi.org/10.1016/j.inffus.2023.101861

[49] Eva Maria (Emy) Koopman. 2015. Why do we read sad books? Eudaimonic motives and meta-emotions. *Poetics* 52, (October 2015), 18–31. https://doi.org/10.1016/j.poetic.2015.06.004

[50] Matthew L Lee-Smith, Jesse Josua Benjamin, Audrey Desjardins, Mathias Funk, William Odom, Doenja Oogjes, Young-Woo Park, James Pierce, Pedro Sanches, and Vasiliki Tsaknaki. 2023. Data as a material for design: alternative narratives, divergent pathways, and future directions. In *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*, 2023. 1–5.

[51] David M Levy. 1997. I read the news today, oh boy: reading and attention in digital libraries. In *Proceedings of the second ACM international conference on Digital libraries*, 1997. 202–211.

[52] Ian Li, Anind Dey, and Jodi Forlizzi. 2010. A stage-based model of personal informatics systems. In *Proceedings of the SIGCHI conference on human factors in computing systems*, 2010. 557–566.

[53] Q. Vera Liao, Daniel Gruen, and Sarah Miller. 2020. Questioning the AI: Informing Design Practices for Explainable AI User Experiences. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, April 21, 2020. ACM, Honolulu HI USA, 1–15. https://doi.org/10.1145/3313831.3376590

[54] Brian Y Lim and Anind K Dey. 2009. Assessing demand for intelligibility in context-aware applications. In *Proceedings of the 11th international conference on Ubiquitous computing*, 2009. 195–204.

[55] Ziming Liu. 2005. Reading behavior in the digital environment: Changes in reading behavior over the past ten years. *J. Doc.* 61, 6 (December 2005), 700–712. https://doi.org/10.1108/00220410510632040

[56] Priscilla Y. Lo. 2024. An Autoethnographic Reflection of Prompting a Custom GPT Based on Oneself. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, May 11, 2024. ACM, Honolulu HI USA, 1–9. https://doi.org/10.1145/3613905.3651096

[57] Caitlin Lustig and Daniela Rosner. 2022. From Explainability to Ineffability?: ML Tarot and the Possibility of Inspiriting Design. In *Designing Interactive Systems Conference*, June 13, 2022. ACM, Virtual Event Australia, 123–136. https://doi.org/10.1145/3532106.3533552

[58] CATHERINE MARSHALL. 2009. *READING AND WRITING THE ELECTRONIC BOOK*. SPRINGER, S.l.

[59] Catherine C Marshall. 2005. Reading and interactivity in the digital library: Creating an experience that transcends paper. In *Proceedings of CLIR/Kanazawa institute of technology roundtable*, 2005. 1–20.

[60] Catherine C Marshall and Frank M Shipman III. 1997. Spatial hypertext and the practice of information triage. In *Proceedings of the eighth ACM conference on Hypertext*, 1997. 124–133.

[61] Elisa D. Mekler and Kasper Hornbæk. 2019. A Framework for the Experience of Meaning in Human-Computer Interaction. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, May 02, 2019. ACM, Glasgow Scotland Uk, 1–15. https://doi.org/10.1145/3290605.3300455

[62] Matthew B. Miles and A. Michael Huberman. 1985. *Qualitative data analysis*. Sage Newbury Park,, CA. Retrieved January 11, 2017 from http://researchtalk.com/wp-content/uploads/2014/01/Miles-Huberman-Saldana-Drawing-and-Verifying-Conclusions.pdf

[63] Caterina Moruzzi and Solange Margarido. 2024. A User-centered Framework for Human-AI Co-creativity. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, May 11, 2024. ACM, Honolulu HI USA, 1–9. https://doi.org/10.1145/3613905.3650929

[64] Caroline Myrberg. 2017. Why doesn't everyone love reading e-books? *Insights UKSG J.* 30, 3 (November 2017), 115–125. https://doi.org/10.1629/uksg.386

[65] Carman Neustaedter and Phoebe Sengers. 2012. Autobiographical design in HCI research: designing and learning through use-it-yourself. In *Proceedings of the Designing Interactive Systems Conference*, June 11, 2012. ACM, Newcastle Upon Tyne United Kingdom, 514–523. https://doi.org/10.1145/2317956.2318034

[66] William Odom and Tijs Duel. 2018. On the Design of OLO Radio: Investigating Metadata as a Design Material. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, April 19, 2018. ACM, Montreal QC Canada, 1–9. https://doi.org/10.1145/3173574.3173678

[67] William Odom, Erik Stolterman, and Amy Yo Sue Chen. 2022. Extending a Theory of Slow Technology for Design through Artifact Analysis. *Human–Computer Interact.* 37, 2 (March 2022), 150–179. https://doi.org/10.1080/07370024.2021.1913416

[68] William Odom, Ron Wakkary, Ishac Bertran, Matthew Harkness, Garnet Hertz, Jeroen Hol, Henry Lin, Bram Naus, Perry Tan, and Pepijn Verburg. 2018. Attending to Slowness and Temporality with Olly and Slow Game: A Design Inquiry Into Supporting Longer-Term Relations with Everyday Computational Objects. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (*CHI '18*), 2018. ACM, New York, NY, USA, 77:1-77:13. https://doi.org/10.1145/3173574.3173651

[69] William Odom, Ron Wakkary, Jeroen Hol, Bram Naus, Pepijn Verburg, Tal Amram, and Amy Yo Sue Chen. 2019. Investigating slowness as a frame to design longer-term experiences with personal data: A field study of olly. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 2019. 1–16.

[70] William Odom, Jordan White, Samuel Barnett, Nico Brand, Henry Lin, Minyoung Yoo, and Tal Amram. 2024. Capra: Making Use of Multiple Perspectives for Capturing, Noticing and Revisiting Hiking Experiences Over Time. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*, May 11, 2024. ACM, Honolulu HI USA, 1–27. https://doi.org/10.1145/3613904.3642284

[71] William Odom, MinYoung Yoo, Henry Lin, Tijs Duel, Tal Amram, and Amy Yo Sue Chen. 2020. Exploring the Reflective Potentialities of Personal Data with Different Temporal Modalities: A Field Study of Olo Radio. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference*, July 03, 2020. ACM, Eindhoven Netherlands, 283–295. https://doi.org/10.1145/3357236.3395438

[72] William Odom, John Zimmerman, and Jodi Forlizzi. 2011. Teenagers and their virtual possessions: design opportunities and issues. In *Proceedings of the SIGCHI conference on Human Factors in computing systems*, 2011. 1491–1500.

[73] William Odom, John Zimmerman, and Jodi Forlizzi. 2014. Placelessness, spacelessness, and formlessness: experiential qualities of virtual possessions. In *Proceedings of the 2014 conference on Designing interactive systems*, June 21, 2014. ACM, Vancouver BC Canada, 985–994. https://doi.org/10.1145/2598510.2598577

[74] Kieron O'Hara, Mischa M. Tuffield, and Nigel Shadbolt. 2009. Lifelogging: Privacy and empowerment with memories for life. *Identity Inf. Soc.* 1, 1 (February 2009), 155–172. https://doi.org/10.1007/s12394-009-0008-4

[75] Doenja Oogjes and Ron Wakkary. 2022. Weaving Stories: Toward Repertoires for Designing Things. In *CHI Conference on Human Factors in Computing Systems*, April 27, 2022. ACM, New Orleans LA USA, 1–21. https://doi.org/10.1145/3491102.3501901

[76] Jonas Oppenlaender and Joonas Hämäläinen. 2023. Mapping the challenges of HCI: An application and evaluation of ChatGPT and GPT-4 for mining insights at scale. *ArXiv Prepr. ArXiv230605036* (2023).

[77] Daniel Orth, Clementine Thurgood, and Elise Van Den Hoven. 2019. Designing meaningful products in the digital age: How users value their technological possessions. *ACM Trans. Comput.-Hum. Interact. TOCHI* 26, 5 (2019), 1–28.

[78] Sundar Pichai. 2023. An important next step on our AI journey. *Google*. Retrieved January 15, 2024 from https://blog.google/technology/ai/bard-google-ai-search-updates/

[79] Samann Pinder, William Odom, MinYoung Yoo, Ayush Misra, Henry Lin, Carman Neustaedter, and Samuel Barnett. 2025. Queue Player: Investigating Distributed Co-Listening Experiences for Social Connection across Space, Time, and Tempo. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, April 25, 2025. ACM Press, Yokohama, Japan. https://doi.org/10.1145/3706598.3714293

[80] Zachary Pousman, Mario Romero, Adam Smith, and Michael Mateas. 2008. Living with tableau machine: a longitudinal investigation of a curious domestic intelligence. In *Proceedings of the 10th international conference on Ubiquitous computing*, 2008. ACM, 370–379. Retrieved from http://dl.acm.org/citation.cfm?id$=$1409685

[81] Nina Rajcic and Jon McCormack. 2023. Message Ritual: A Posthuman Account of Living with Lamp. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, April 19, 2023. ACM, Hamburg Germany, 1–16. https://doi.org/10.1145/3544548.3581363

[82] Melanie Ramdarshan Bold and Kiri L. Wagstaff. 2017. Marginalia in the digital age: Are digital reading devices meeting the needs of today's readers? *Libr. Inf. Sci. Res.* 39, 1 (January 2017), 16–22. https://doi.org/10.1016/j.lisr.2017.01.004

[83] Allen H Renear, Steve J DeRose, Elli Mylonas, and Andries van Dam. 1999. An outline for a functional taxonomy of annotation. *STG Tech. Note* (1999).

[84] John Rooksby, Mattias Rost, Alistair Morrison, and Matthew Chalmers. 2014. Personal Tracking As Lived Informatics. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (*CHI '14*), 2014. ACM, New York, NY, USA, 1163–1172. https://doi.org/10.1145/2556288.2557039

[85] Claudia Rosenhan and Nicola Galloway. 2019. Creativity, self-reflection and subversion: poetry writing for Global Englishes awareness raising. *System* 84, (August 2019), 1–13. https://doi.org/10.1016/j.system.2019.04.005

[86] Kara Sage, Michael Piazzini, John Charles Downey, and Langa Masilela. 2020. Reading from print, laptop computer, and e-reader: Differences and similarities for college students' learning. *J. Res. Technol. Educ.* 52, 4 (October 2020), 441–460. https://doi.org/10.1080/15391523.2020.1713264

[87] Pedro Sanches, Noura Howell, Vasiliki Tsaknaki, Tom Jenkins, and Karey Helms. 2022. Diffraction-in-action: Designerly Explorations of Agential Realism Through Lived Data. In *CHI Conference on Human Factors in Computing Systems*, April 29, 2022. ACM, New Orleans LA USA, 1–18. https://doi.org/10.1145/3491102.3502029

[88] Hanee Shin. 2022. Bookclub Millie files application to be listed on Kosdaq. Retrieved from https://koreajoongangdaily.joins.com/2022/05/30/business/industry/Korea-KT-Bookclub-Millie/20220530163936677.html

[89] Saloni Singh, Koen Hindriks, Dirk Heylen, and Kim Baraka. 2025. A Systematic Review of Human-AI Co-Creativity. *ArXiv Prepr. ArXiv250621333* (2025).

[90] Patrick Spedding and Paul Tankard. 2021. *Marginal notes: Social reading and the literal margins*. Springer.

[91] Erik Stolterman and Mikael Wiberg. 2010. Concept-driven interaction design research. *Human–Computer Interact.* 25, 2 (2010), 95–118.

[92] Jiao Sun, Q. Vera Liao, Michael Muller, Mayank Agarwal, Stephanie Houde, Kartik Talamadupula, and Justin D. Weisz. 2022. Investigating Explainability of Generative AI for Code through Scenario-based Design. In *27th International Conference on Intelligent User Interfaces*, March 22, 2022. ACM, Helsinki Finland, 212–228. https://doi.org/10.1145/3490099.3511119

[93] Wenn-Chieh Tsai, Amy Yo Sue Chen, Sheng-Yang Hsu, and Rung-Huei Liang. 2015. CrescendoMessage: interacting with slow messaging. In *Proceedings of the International Association of Societies of Design Research Conference*, 2015. 2078–2095.

[94] Vera Van Der Burg, Gijs De Boer, Alkim Almila Akdag Salah, Senthil Chandrasegaran, and Peter Lloyd. 2023. Objective Portrait: A practice-based inquiry to explore AI as a reflective design partner. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference*, July 10, 2023. ACM, Pittsburgh PA USA, 387–400. https://doi.org/10.1145/3563657.3595974

[95] Pauliina Tea Eleonoora Vuorinen, Benjamin W. Tatler, and Frank Keller. 2024. Tracking e-reading behavior: uncovering the effects of task context, electronic experience, and motivation. *Front. Educ.* 8, (January 2024), 1302701. https://doi.org/10.3389/feduc.2023.1302701

[96] Ron Wakkary, Henry Lin, Shannon Mortimer, Lauren Low, Audrey Desjardins, Keith Doyle, and Philip Robbins. 2016. Productive Frictions: Moving from Digital to Material Prototyping and Low-Volume Production for Design Research. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems*, 2016. ACM, 1258–1269. Retrieved from http://dl.acm.org/citation.cfm?id$=$2901880

[97] Ron Wakkary, Doenja Oogjes, Henry W. J. Lin, and Sabrina Hauser. 2018. Philosophers Living with the Tilting Bowl. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (*CHI '18*), 2018. ACM, 94:1-94:12. https://doi.org/10.1145/3173574.3173668

[98] Qian Wan, Xin Feng, Yining Bei, Zhiqi Gao, and Zhicong Lu. 2024. Metamorpheus: Interactive, Affective, and Creative Dream Narration Through Metaphorical Visual Storytelling. *ArXiv Prepr. ArXiv240300632* (2024).

[99] Danding Wang, Qian Yang, Ashraf Abdul, and Brian Y Lim. 2019. Designing theory-driven user-centric explainable AI. In *Proceedings of the 2019 CHI conference on human factors in computing systems*, 2019. 1–15.

[100] Jordan White, William Odom, Nico Brand, and Ce Zhong. 2023. Memory Tracer & Memory Compass: Investigating Personal Location Histories as a Design Material for Everyday Reminiscence. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, April 19, 2023. ACM, Hamburg Germany, 1–19. https://doi.org/10.1145/3544548.3581426

[101] Tongshuang Wu, Michael Terry, and Carrie Jun Cai. 2022. AI Chains: Transparent and Controllable Human-AI Interaction by Chaining Large Language Model Prompts. In *CHI Conference on Human Factors in Computing Systems*, April 29, 2022. ACM, New Orleans LA USA, 1–22. https://doi.org/10.1145/3491102.3517582

[102] Tongshuang Wu, Michael Terry, and Carrie Jun Cai. 2022. AI Chains: Transparent and Controllable Human-AI Interaction by Chaining Large Language Model Prompts. In *CHI Conference on Human Factors in Computing Systems*, April 29, 2022. ACM, New Orleans LA USA, 1–22. https://doi.org/10.1145/3491102.3517582

[103] Junjie Ye, Xuanting Chen, Nuo Xu, Can Zu, Zekai Shao, Shichun Liu, Yuhan Cui, Zeyang Zhou, Chao Gong, Yang Shen, and others. 2023. A comprehensive capability analysis of gpt-3 and gpt-3.5 series models. *ArXiv Prepr. ArXiv230310420* (2023).

[104] He Zhang, Chuhao Wu, Jingyi Xie, ChanMin Kim, and John M Carroll. 2023. QualiGPT: GPT as an easy-to-use tool for qualitative coding. *ArXiv Prepr. ArXiv231007061* (2023).

[105] Yin Zhang and Sonali Kudva. 2014. E-books versus print books: Readers' choices and preferences across contexts. *J. Assoc. Inf. Sci. Technol.* 65, 8 (2014), 1695–1706.

[106] Ce Zhong, Ron Wakkary, Amy Yo Sue Chen, and Doenja Oogjes. 2023. deformTable: A design inquiry and long-term field study into creative and contingent appropriations of a shape-changing artifact. *Int. J. Des.* 17, 1 (2023), 55–70.

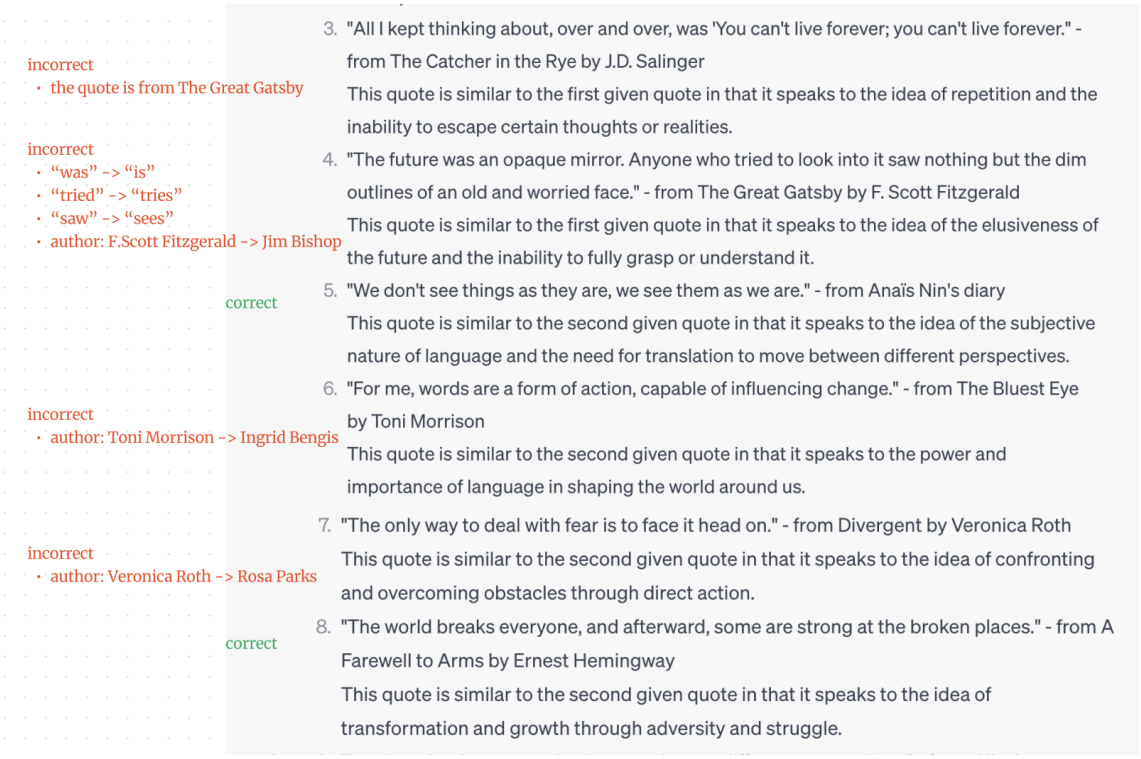
[107] John Zimmerman. 2009. Designing for the self: making products that help people become the person they desire to be. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2009. ACM, 395–404. Retrieved September 27, 2016 from http://dl.acm.org/citation.cfm?id$=$1518765

[108] John Zimmerman, Jodi Forlizzi, and Shelley Evenson. 2007. Research through design as a method for interaction design research in HCI. In *Proceedings of the SIGCHI conference on Human factors in computing systems*, 2007. ACM, 493–502. Retrieved from http://dl.acm.org/citation.cfm?id$=$1240704

[109] GPT models. Retrieved from https://platform.openai.com/docs/guides/gpt

[110] Vercel. Retrieved from https://vercel.com/

A Quote recommendations from the gpt-3.5 Turbo model



This is a screenshot from an interaction with the GPT-3.5 model. We discovered a mix of true and false information when we prompted the model to recommend ten quotes that are relevant to one of FA's e-book highlights. Some quotes in the list were correct, but they were matched with a wrong title of the book or a name of the author. In some cases, several words of the original quote were modified.

B Keyword selection prompt

We instructed the GPT-3.5 Turbo model to select one keyword that is not directly sourced from the quote but is semantically related to the other two keywords. We added this requirement so that the one keyword would act as a gateway for users to potentially bring in new elements through their response that could enrich the meaning of the original quote in the output. The following prompt was used to generate three keywords:

> "Based on the semantic meaning of the following quote, pick two words that might best capture the overall meaning and follow the requirements. Also, pick a word that is semantically related to the two words but is unrelated to the quote. "[RANDOMLY SELECTED HIGHLIGHT]" - from [TITLE] by [AUTHOR] Formatting requirements: - Put each keyword after 'Word 1:', 'Word 2:', and 'Word 3:'- Don't add any other information other than the keywords, 'Word 1:', 'Word 2:', and 'Word 3:'. - switch up the order of words so that the viewer won't know which word is the random one. Requirements for choosing the words: - pick non-generic words that are not too commonly appearing"

C FA'S DIARY ENTRIES OF INTERACTING WITH QUOLOGUE

While experimenting with the Quologue prototype system, FA kept a record of three keywords, FA's response to the keywords, the original quote where the three keywords are derived from, and the remix (referred to as a "synthesized quote" in the screenshots). Each of the entries included FA's personal reflection on the output, which focused on FA's motive behind writing a certain response or any emotional reaction from interacting with Quologue. An example of FA's personal reflections is shown in C.2.

C.1 Diary entry on July 19, 2023

Three Keywords
Self-discovery; Identity; Water

My response to the keywords
When we talked about younger people now who are so obsessed with their identity, I had the image of Narcissus who was so captivated by the image of himself reflected on water that he drowned himself. Before he drowned, do you think he discovered himself in the image of himself floating on water?

Original quote
As we go through life we gradually discover who we are, but the more we discover, the more we lose ourselves.

Synthesized quote
As we journey through life, gradually unraveling our true selves, we may inadvertently succumb to the allure of self-obsession. Like Narcissus, captivated by his reflection in the water, we risk losing ourselves amidst the depths of our own identity. Yet, before his ill-fated demise, did Narcissus truly discover his essence within the fleeting image upon the water's surface?

The keyword "water" was, in fact, randomly generated based on the requirements in the prompt and was not related to the original quote (see 3.1 for more details on these requirements). When FA encountered the keyword "water" with the other two keywords "self-discovery" and "identity," FA contextualized the keyword "water" by conjuring up the image of Narcissus who drowned in water by being captivated by the image of himself reflected on water. The random output from the GPT-3.5 model inspired FA to come up with the new allegory of Narcissus which was coherent to the theme of the original quote and added an interesting layer of meaning in the synthesized quote.

C.2 FA's diary entry on August 10, 2023

Three Keywords
solitude; contemplation; pain

My response to the keywords
Sensing another wave of pain flooding in, I return to solitude. Lights turned off and curtains opened, the lights from the apartment across from mine were glowing so warmly. I blast Tchaikovsky's Symphony No. 6 on my Klipsch speaker and start contemplating in peace.

Original quote
A man of this spirit can enjoy reading or contemplation even in the most solitude.

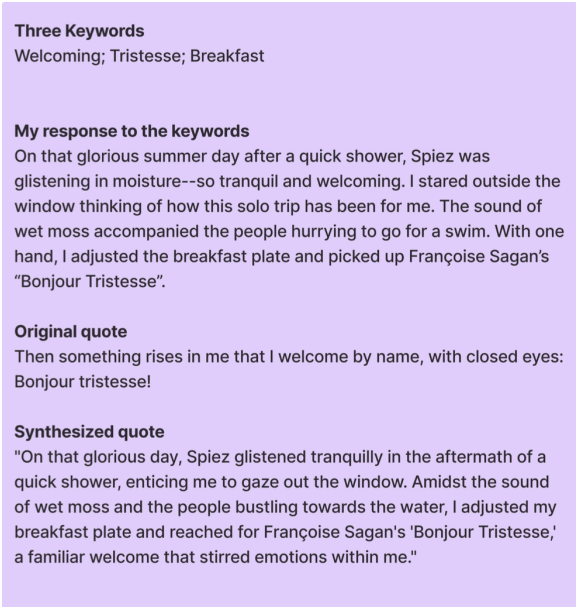
Synthesized quote
"Embracing the spirit of solitude, a man finds solace in reading or contemplation, even in the most isolated moments." Sensing the oncoming tide of emotion, I retreat into my own solitude. With curtains drawn and the apartment aglow from the neighboring windows, the warm ambiance envelops me. The serene notes of Tchaikovsky's Symphony No. 6 fill the air, guiding my contemplation into a tranquil haven.

The following is FA's reflection on viewing this ambiguous output which was not remixed cohesively accordingly to the prompt requirements:

> "At first, I thought this was a bad [remix] since it's clear to see where the original quote ends and my response starts. But then, I noticed the GPT model added double quotation marks when it talks about the content in the original quote. I read it again, and it felt like the sentence between the double quotations was the character's inner thought or a quote the character remembers and uses it to describe the context. And it primed the experience of reading my response that came afterwards.

This took a bit more reading than usual, but the clear demarcation of content made me think about the narrative structure of the [remix] a bit more, which was fascinating."

C.3 FA's diary entry on August 7, 2023



After reflecting on the keywords generated based on a highlight from the book *Bonjour Tristesse*, FA decides to portray FA's personal memory with the goal of drawing the same kind of melancholic mood present in the original novel.

"[T]his specific keyword "tristesse" made me realize exactly what this quote is and which book it's from. I remember highlighting the last sentence of Bonjour Tristesse, which had this specific word that was not translated into English. Looking at these keywords made me think of the unique mood of this novel, which comes from a sensitive and turbulent teenage girl having a summer vacation in the south of France. I wanted to draw the same kind of melancholic mood from my own experience of traveling alone in Switzerland, hoping the GPT model would create a coherent narrative around this mood. I was satisfied to see my memory was stitched well together with the mood of the story."

D Remix generation prompt

After users submit their written response, the following prompt was used to generate the remix of their response and highlight:

"Pretend you are a writer synthesizing two different quotes: Use these two sentences (under double quotation marks) as materials for a new synthesized quote that effectively connect the meaning of the original sentences and be very sure to follow the requirements after the quotes. "[RANDOMLY SELECTED HIGHLIGHT]" "[RESPONSE]" Requirements for connecting sentences: - use simple and concise language - feel free to break up the original structure of the previous two sentences to change, add, or subtract as long as the tone of the original sentences is preserved - the output should have maximum three sentences."