

Read and Reflect: Exploring How the Display of User-Generated Content Shapes In-Situ Museum Expression

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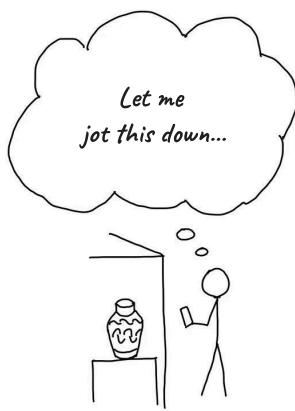


Figure 1: Visitors browse others' user-generated content (UGC) during museum visits and contribute their own expressions. Guided by concerns of narrative coherence and information integration, we designed four UGC display modes to explore how UGC display shapes meaning-making and in-situ expression: (a) Comment Board; (b) Forum; (c) Single Voice; (d) Crowd Narrator.

Abstract

Museums increasingly collect user-generated content (UGC), yet such materials are often presented as fragmented messages of visitors' voluntary expressions. Prior work suggests that encountering others' perspectives can prompt reflection and dialogue, but it remains unclear how different UGC display approaches shape visitors' experiences and in-situ expression during a visit. In this work, we distill strategies from prior research into four UGC display modes and design corresponding prototypes as design probes. Through a field study conducted in a museum, we compare how different display approaches influence visitors' meaning-making and expressive behaviors. Based on our findings, we derive design implications for

supporting UGC-driven in-situ expression and offer insights into designing more communicative museum experiences.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; *Empirical studies in interaction design*.

Keywords

User-Generated Content, In-Situ Expression, Museum

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1 Introduction

Museums are widely regarded as sites of meaning making, where visitors actively construct personal interpretations and experiences through encounters with narratives and spatial settings [26, 28, 32].

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As a result, museums have increasingly become fertile grounds for user-generated content (UGC) [20, 23], including visitor comments and reflections that extend beyond curatorial narratives. At the same time, visitors often experience immediate thoughts and emotions during the act of visiting itself [3, 11, 29]. Compared to reflections produced after the visit, these in-situ expressions are highly contextual and closely tied to the exhibition environment [8]. However, such impressions often remain internalized and ephemeral, visitors may struggle to recall contextual details once they leave [15], while museums have limited means to capture these situated experiences as feedback.

Falk and Dierking [9] propose that visitors' museum experiences emerge through the interactions of physical, personal, and social contexts. Within the social context, other visitors' comments can shape individual interpretations by providing points of comparison and resonance [5, 30]. Real-time sharing and browsing of peer perspectives can further foster dialogic engagement [19], motivating visitors to articulate their own viewpoints. In this participatory process, developing one's own interpretations while sharing and engaging with the perspectives of others aligns with the paradigm of Citizen Curation [2]. In this process, interpretation and reflection mutually inform each other, forming an Interpretation–Reflection Loop (IRL) that supports deeper meaning making [2]. Thus, presenting others' UGC as prompts for in-situ expression offers a promising design direction.

In current museum practices, UGC is commonly displayed through comment-board-style mechanisms, such as visitor books or feedback boards, primarily for collecting suggestions [30]. While effective for institutional feedback, these displays are rarely designed with other visitors as intended readers, often presenting fragmented content with limited contextual coherence [14], and independent from or approaching the end of the exhibition flow. Although prior work has explored approaches to eliciting UGC that supports diverse and communicative participation, such as visitor curation and narrative creation [12, 25], these user-generated materials are rarely reused or exhibited, remaining ephemeral artifacts primarily collected for research purposes. Consequently, it remains unclear what types of UGC visitors meaningfully engage with during a visit, and what kinds of presentation effectively prompt in-situ expression.

In this work, we review strategies from prior work and translate them into four prototypes that serve as design probes. Taking *the Museum of Wu* in Suzhou, China as a case, we conduct a user study to explore how different UGC organization and presentation designs influence visitors' visiting experiences and in-situ expression. Based on our findings, our work contributes insights and design implications for UGC-driven museum experiences.

2 System Design

In this section, we review prior work on museum UGC display, distill existing design strategies into four modes (see Fig. 2), and then design corresponding prototypes as design probes.

2.1 Strategies for Displaying Museum UGC

Museum UGC often appears as physical guest books [4, 19] and feedback screens [30], as well as online formats including posts

and comments on websites and social media [22]. Such content is typically presented as raw and unstructured fragments. Recent work has explored a wider range of UGC display approaches to support more readable and communicative experiences, such as adding contextual information or constructing a complete visiting flow to form coherent storylines [18, 24] and integrating dispersed comments through narrative or aggregation mechanisms [13, 27, 31]. From this body of work, we distill two key design concerns and their spectrum. Specifically,

- **Narrative coherence** describes whether UGC forms a spatial-temporal interpretive flow, bringing visitors a cohesive story throughout the tour (continuous v.s. discrete).
- **Information integration** refers to whether contributions are shown as the original content or aggregated representations (original v.s. integrated).

2.2 Prototype Design

We took *the Museum of Wu* as the testbed and designed four prototypes representing different display modes. To acquire real visitor expression, we crawled publicly available UGC from RedNote¹ (a lifestyle social media platform) and Dianping² (a location-based review platform). Specifically, we adopted a hashtag-based snowball sampling approach [10] on RedNote and directly collected visitor comments for *the Museum of Wu* on Dianping, resulting in an initial dataset of 2,929 posts and comments. We then filtered the dataset and mapped the UGC to specific artifacts. Based on UGC richness, we selected four representative artifacts from the permanent exhibition and retained comments related to them, yielding the final dataset for prototype design.

Based on this dataset, we designed four mode-based prototypes as design probes (see Fig. 1). The four display modes were accessible in a unified web-based application system, enabling controlled comparison across different approaches.

2.2.1 Comment Board (Original, Discrete). This mode presents original posts and comments as independent entries for each artifact (see Fig. 1a). Artifacts are treated as separate units without cross-artifact narrative linkage, resulting in a discrete viewing experience. Users can submit new comments via a posting button.

2.2.2 Forum (Integrated, Discrete). Similar to the Comment Board, artifacts are presented independently in this prototype (see Fig. 1b). For each artifact, posts are grouped into AI-generated topics summarizing key discussions and annotated with contributor counts. Users can comment within each topic thread.

2.2.3 Single Voice (Original, Continuous). Continuous modes present all artifacts within a unified chat interface. In Single Voice, original UGC from a single narrator, who commented on all four artifacts, is arranged in a predefined artifact order (see Fig. 1c). Messages appear sequentially following visitors' viewing pace.

2.2.4 Crowd Narrator (Integrated, Continuous). This mode also uses a chat interface but presents AI-generated summaries for each artifact, integrating contributions from multiple visitors (see Fig. 1d).

¹<https://www.xiaohongshu.com>

²<https://www.dianping.com>

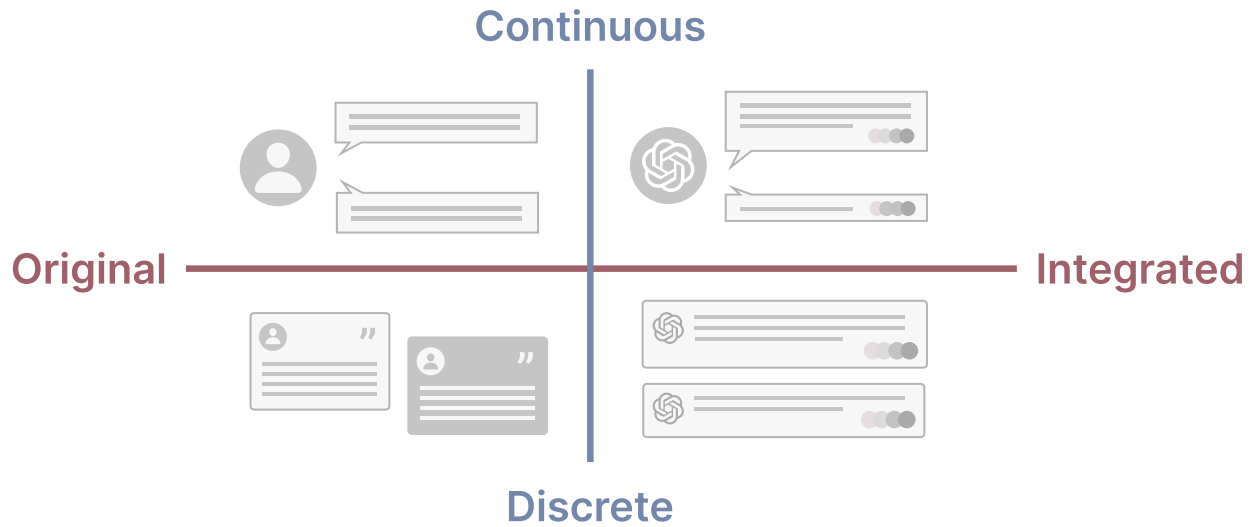


Figure 2: The four UGC display modes derived from two dimensions: narrative coherence (continuous vs. discrete) and information integration (original vs. integrated). Narrative coherence concerns the spatial-temporal continuity of the tour, while information integration refers to whether UGC is presented in original or integrated form.

3 Method

To explore how different UGC display modes influence visitors' museum visiting experiences and in-situ expression, we conducted a user study at *the Museum of Wu*. We recruited 10 participants (aged 29–53, $M = 35$, $SD = 7.36$) via social media. All participants reported a strong interest in cultural heritage and visited museums at least twice a year. None had visited this museum before.

The study began with a brief introduction and tutorial to familiarize participants with the system. Participants then proceeded to explore the museum. We adopted a hybrid study design to balance experimental control and ecological validity. In the controlled phase, participants accessed the prototypes via their smartphones and were each designated a primary display mode, during which they located and viewed four selected artifacts, spending three minutes per artifact. The primary mode assigned to each participant was counterbalanced among the participants. In the subsequent free-roaming phase, participants were encouraged to switch between the other three modes based on their preferences. Participants were informed that the system content served as a supplement but was not intended to replace authoritative museum information. Overall, participants spent 19.79 minutes ($SD = 4.83$) with the prototypes on average. After the visit, we conducted semi-structured interviews focusing on participants' experiences of interacting with UGC through the system as well as their comparisons across the four display modes. The entire session lasted approximately one hour for each participant.

During the study, we collected system logs and interview audio recordings. The audio recordings were transcribed, and an inductive thematic analysis [1] was conducted on the transcripts. We first adopted an inductive open-coding approach, two authors independently coded the data and met regularly to discuss discrepancies

and reach consensus. The emerging themes were then reviewed and refined for coherence and representativeness, resulting in the final thematic structure. Content generated by participants within the system was incorporated as complementary qualitative material to support the interpretation of the findings.

4 Results

In this section, we present the primary themes constructed through our inductive thematic analysis. These themes capture recurring patterns of shared meaning across participants' accounts regarding how UGC display modes shaped their expectations and experiences.

4.1 UGC: An Additional Source of Information and the Need for Social Connections

Across interviews, participants repeatedly described expectations when engaging with UGC in museums. A recurring theme concerned the expectation of **obtaining additional sources of information**. Some participants ($n = 5$) expected UGC to supplement official museum information by offering broader perspectives and richer content, and thus preferred integrated presentations that quickly conveyed a large amount of information. For example, P02 noted a desire to hear insights from visitors who had conducted prior research, while P07 preferred others' more straightforward expressions over official descriptions. P06 further described integrated content as "*a portal*" that provided an initial point of entry for approaching unfamiliar artifacts. In addition, participants reported the expectation of **social connections** when reading UGC. Although all participants reported having immediate thoughts during visits, in-situ expression was found challenging due to the time constraint. Some participants ($n = 5$) therefore expressed a desire to extend the visit and communicate with others through the system, using UGC

to record and resonate with viewpoints. For example, P03 noted that seeing others' thoughts made them *"want to respond"*, while P06 described others' comments as helping transform vague feelings into something more concrete. This social expectation was often associated with a preference for unintegrated, raw content. P04 noted that diverse individual expressions encouraged participation, while P05 highlighted the importance of attribution for interpreting and evaluating others' viewpoints.

4.2 Trade-offs in Information Integration and Narrative Coherence

Our prototypes attempted to understand how visitors perceive the information integration and narrative coherence of different UGC display approaches. Regarding information integration, some participants ($n = 5$) preferred integrated content, as quick summaries provided mainstream perspectives and reduced cognitive workload. However, others ($n = 3$) criticized the summaries for lacking a *"human-like"* quality and raised concerns about the authenticity and bias of AI-generated content, preferring raw comments that felt like *"talking with real people"* (P02). Regarding narrative coherence, though some participants ($n = 2$) appreciated discrete narratives for the flexibility of switching between artifacts, most participants ($n = 8$) preferred the continuous approach because it provides guidance and a sense of accompaniment, and helps users link previous and current artifacts. In addition, all participants preferred the modes that show perspectives from multiple visitors over content from an individual. As P06 noted, the Single Voice mode felt like being *"in an information island,"* offering only a limited source of information.

4.3 Expressive Styles Shaped by Display Modes

We found that different display modes shaped participants' expressive styles and, in turn, influenced their self-expression expectations. Chat-based modes with continuous context made participants feel like talking privately with a friend, lowering social pressure and leading to more casual expression, such as *"not considering spelling or grammar"* (P07). In contrast, when posting on comment boards or forums that seem public, participants tended to be more cautious and formal, reflecting heightened social concerns and self-censorship (P06, P07). However, interestingly, participants' motivation to express themselves was more strongly triggered by public platform style modes. Five participants (P02, P04, P06, P07, P10) preferred discrete modes as better promoting expression, while only two (P03, P09) preferred continuous modes. In continuous modes, participants tended to *"receive the knowledge rather than expression"* (P04), because the narrator was *"merely telling me what it is"* (P02). In contrast, comment boards and forums encouraged exploration of and responses to others' UGC (P06, P07).

5 Discussion

In this work, we designed four UGC display modes for museums and examined how they shape visitors' experiences and in-situ expression. Based on our findings, we derive two implications for UGC presentation in museum contexts.

5.1 Design Implications

5.1.1 To support the use of UGC as an additional source of information. Our findings suggest that museum visitors tend to be interested in encountering others' UGC and value multi-perspective content, which is consistent with the findings in [17]. However, visitors approached UGC with different expectations, which shaped their preferences for display modes and affected their expectations to express. This aligns with prior theories highlighting the interplay between visitors' identities, motivations, and learning in museum experiences [7, 21]. A complete museum visiting and meaning-making experience is composed of multiple phases, including pre-, during-, and post-visit stages [16]. Visitors' expectations will shift over time. Thus, UGC presentation should be treated as a dynamic element that evolves throughout the visit. For example, when first entering the visit, visitors could benefit from highly integrated UGC displays that support rapid understanding, while with greater familiarity, it may foreground more expressive or socially oriented modes to encourage resonance and communication. Systems could further support this process by recognizing visitors' emerging expectations or allowing visitors to actively switch between display modes during the visit.

5.1.2 To support visitors' in-situ expression in museum visiting. We found that immediate thoughts commonly emerge during museum visits but are rarely recorded or expressed in-situ. Visitors' willingness to express is closely related to the perceived appropriateness of the audience and whether their expression is likely to be understood or responded to. Presenting others' UGC offers a viable way to prompt in-situ meaning-making and expression, which serve different purposes, such as seeking resonance, obtaining answers, or simply recording personal reflections. Museum visiting is not a passive process of information reception, but one of personalized interpretation grounded in prior experiences and motivations [6]. Supporting expression can therefore facilitate deeper meaning-making. However, users' intention to express is affected by complex physical, cultural, and social contexts. For example, in conversational contexts, users may perceive the content to be generated by a guide or expert and adopt a listener role. In social-media-like contexts, they adopt a mental model of peer expressions, which more readily stimulate one's own participation. We therefore suggest supporting diverse expressive expectations by offering graduated levels of expression, ranging from low-effort actions (e.g., likes and favorites) to brief comments and more elaborate reflections. In addition, allowing users to control the visibility of their contributions could accommodate different preferences.

5.2 Limitations and Future Work

In this work, we designed and evaluated prototypes of four different UGC display modes. As an initial exploration, we limited the scope of the visit to a single exhibition room and designed it around a limited set of key artifacts. Future work could expand the design to a more complete museum trajectory and enrich interaction strategies, for example, by introducing feedback mechanisms into chatting modes to enable more natural and responsive dialogues. Our user study also involved a relatively small sample size. Although it allowed us to derive some exploratory insights, future studies should

include more diverse participant groups to capture broader perspectives and account for differences across backgrounds. Finally, future work should more deeply investigate the mapping between visitors' expectations during museum visits and different display and interaction approaches, and extend this mapping across the overall meaning-making process to better support expression, communication, and reflection in museum experiences.

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