Machiaruki or Machizukuri? Staged Co-design in the Development of "dédédé"

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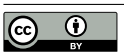
ABSTRACT

Civic technology platforms are increasingly developed through collaborative processes involving diverse stakeholders. Yet existing participatory design literature offers limited theoretical attention to collaborative trajectories that deviate from a canonical model in which co-design is structured and intentional from the outset. This paper presents a reflective account of the development of "dédédé", an online platform that invites citizens to informally document and share observations about their neighborhoods. The platform was initially conceived and developed by a team of technologists, then evolved through two co-design phases involving progressively broader stakeholder communities: first with urban designers and other practitioners experienced in facilitating *machiaruki* ("town-walking") workshops, then with city officials and real estate developers interested in leveraging the platform for *machizukuri* ("town-building") efforts. We show that these phases produced qualitatively distinct collaborative dynamics: the first characterized by *receptive redesign*, in which domain expertise corrected the implicit assumptions of the technical team; the second by *active negotiation and resistance*, in which the design knowledge accumulated in the first phase became a resource (*design anchor*) for mediating competing stakeholder visions. We argue that such staged co-design processes represent a recognizable and undertheorized mode of civic technology development, with distinct benefits and risks.

CCS CONCEPTS

• **Human-centered computing** → **Participatory design**; *Collaborative and social computing systems and tools*; • **Applied computing** → Computers in other domains.



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KEYWORDS

Civic technology, participatory urbanism, participatory design

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1 INTRODUCTION

Civic technology platforms have emerged as an important mechanism for broadening citizen participation in urban governance and civic life. Platforms such as civic reporting systems [3, 10], collaborative mapping tools [8, 12], and participatory democracy software [1, 9] attempt to lower barriers to engagement and enable new forms of collaboration between citizens, professionals, and institutions. As these platforms have proliferated, so too has scholarly interest in how they are designed. A growing body of work in Human-Computer Interaction (HCI) and Participatory Design (PD) has examined the effectiveness of co-designing civic platforms with stakeholders [21, 23, 53]. However, much of this work takes as its reference point a *canonical* model of co-design, where an intentionally assembled group of stakeholders participates from the outset in a structured, end-to-end design endeavor. In practice, many civic technology projects emerge through less structured, more fragmented trajectories. Platforms frequently begin their lives within technical teams or narrow collaborations, and expand their stakeholder base incrementally as development progresses. The specific collaborative dynamics that arise when stakeholder involvement expands mid-process, and the ways in which the sequencing of participation shapes design outcomes, remain underexplored.

This paper presents a reflective case study of "dédédé" [2], a civic technology platform that allows citizens to share everyday urban observations through geotagged posts containing text, photos,

and sound recordings. The platform aims to foster public curiosity about urban environments and provide an accessible entry point to more active forms of participatory urbanism. While dédédé was developed collaboratively, this collaboration was not planned as a holistic, multi-stakeholder endeavor from the outset. Instead, the platform began with an Initial Prototyping period in which a bare-bones prototype was conceived and developed by a small group of technology experts (with software engineering and UI/UX expertise; we call this group the *technical team*), before evolving through two co-design phases involving progressively broader stakeholder communities. In the first co-design phase (Phase C1), the platform was refined through collaboration with urban designers and other practitioners experienced in facilitating *machiaruki* ("town-walking") workshops, a widely practiced participatory activity in Japan in which participants explore their neighborhoods and collectively document observations as a casual form of civic engagement. In the second co-design phase (Phase C2), the collaboration expanded to include city officials and real estate developers interested in the potential of the platform to support *machizukuri* ("town-building") initiatives, which involve more structured and consequential forms of citizen participation than machiaruki. In other words, dédédé evolved through a staged co-design process (Figure 1), in which the range of collaborators expanded progressively across phases.

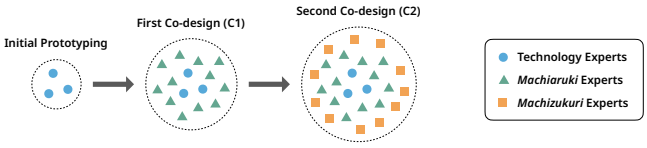

Figure 1: The staged co-design process of dédédé. Starting with a non-collaborative prototyping period, new domain experts (machiaruki experts in Phase C1, machizukuri experts in Phase C2) joined the process in each subsequent phase.

This staged trajectory produced two qualitatively distinct modes of collaboration, each presenting its own challenges and opportunities. During Phase C1, domain experts primarily served as corrective voices, identifying shortcomings in the technical team's implicit assumptions and proposing design modifications grounded in their experience with real-world workshop practice. The technical team's role in this phase was largely that of a learner, receptive to expertise that reshaped the platform's interaction model in ways the technical team would not have arrived at independently. During Phase C2, newly introduced stakeholders brought competing visions of what the platform should be and do, transforming the technical team's role from learner to mediator — tasked with navigating disagreements between stakeholders with divergent expertise and institutional interests, while maintaining the design coherence that had been established through the previous phase. Throughout both co-design phases, feedback from workshop participants provided an additional source of design input that complemented the perspectives of domain experts. (Note: the authors of this paper are a subset of the Phase C1 co-design team.)

The remainder of the paper proceeds as follows. Section 2 reviews related work on participatory design processes, civic technology design, and the role of domain expertise in collaborative design. Section 3 provides background on machiaruki and machizukuri as participatory urbanism practices, situating dédédé within the Japanese urban design and planning context while drawing connections to analogous practices internationally. Section 4 describes the current version of dédédé and its key functionalities. Section 5 presents the staged design process in detail, documenting a series of design episodes that illustrate how collaboration shaped the platform across stages. Section 6 discusses the implications of this trajectory for civic technology development, with particular attention to the opportunities and challenges of such staged participatory processes.

The paper's main contributions are threefold: 1) through a reflective case study of dédédé, we demonstrate the specific benefits and risks of staged participation as an alternative to the canonical end-to-end co-design model; 2) we introduce the twin notions of *receptive redesign* and *active negotiation and resistance* as distinct modes of collaborative dynamics that emerge in staged co-design processes; and 3) we introduce the notion of *design anchor*, i.e., accumulated design knowledge that enables principled mediation when a broader stakeholder community introduces competing visions, as a theoretical construct for understanding staged co-design.

2 RELATED WORK

2.1 Participatory Design and Co-Design

Participatory Design (PD) has long advocated for involving stakeholders directly in the design process, emphasizing that those affected by a technology should have a meaningful say in its creation. Early PD work [16, 24] emerged from Scandinavian traditions that sought to empower workers in the design of workplace technologies, establishing participation not merely as a methodological strategy but as a democratic imperative. More recent work in HCI has extended PD approaches to civic contexts, including urban planning [28] and community engagement [21, 53].

As PD has moved from workplace tools to complex civic ecosystems, the notion of "stakeholders" has become increasingly diverse and fragmented. Contemporary civic technology literature frequently highlights friction between top-down institutional goals such as efficiency, accountability, and data-driven governance, and bottom-up community needs such as agency, social cohesion, and accessibility [26, 30, 50]. This has prompted researchers to attend more carefully to the composition of stakeholder groups and the power dynamics between them.

While PD studies frequently describe processes in which diverse stakeholders are assembled intentionally from the outset, participating in structured co-design activities throughout the project lifecycle [45], less theoretical attention has been given to situations where stakeholder involvement expands or shifts as a project evolves — a trajectory that reflects a common reality in civic technology development, where platforms often begin as technical prototypes or narrow collaborations before attracting broader professional and institutional interest. One body of work that speaks to this dynamic is Agonistic PD [17, 41], which reframes design not as a search for consensus but as a site of productive conflict between stakeholders with genuinely competing interests and values. This framing is particularly relevant to our experience in Phase C2, where expanding the stakeholder circle introduced competing

visions of the platform's purpose that could not be fully reconciled, and where the design process required active mediation as opposed to collaborative convergence.

2.2 Civic Technology Platforms

Civic technology platforms have been widely explored as tools for supporting citizen engagement, participatory governance, and urban planning. Such platforms are now used worldwide, illustrating how digital systems can facilitate communication and collaboration between citizens and public institutions.

A useful distinction can be drawn between platforms that are officially sanctioned by governments and where public officials play active roles, and those that operate independently of formal governance structures. Examples of the former include issue reporting tools [3, 10] where citizens report local problems such as potholes that are subsequently addressed by municipal employees, and participatory democracy tools [1, 51, 55] which support structured forms of civic engagement including proposal submission, deliberation, and voting. Such officially sanctioned platforms carry certain advantages, for example in fostering the perception that citizen contributions matter, but they also introduce a degree of formality that can raise the perceived stakes of participation and deter casual or exploratory engagement [34, 37]. Examples of the latter include community-driven platforms such as participatory mapping tools [29], which prioritize accessibility and low-stakes engagement over direct institutional integration.

Our platform dédédé was conceived in this latter tradition of independent civic platforms, focusing on everyday observations and experiences of urban environments rather than formal civic reporting with expectations of institutional response. However, as our network of collaborators grew to include institutional partners, we introduced several additional features to support usage in formally-organized workshops. Such features were carefully designed so as not to erase the platform's informal character, a tension we return to in our discussion of Phase C2. As we describe in this paper, this positioning of dédédé within the civic technology landscape was not fully articulated at the outset of development but emerged through the collaborative process itself.

2.3 Domain Expertise in Collaborative Design

A recurring theme in PD literature is the distinction between different kinds of knowledge that stakeholders bring to a design process. End users contribute experiential knowledge, i.e., an understanding of their own needs, preferences, and practices. By contrast, domain experts contribute professional knowledge about the phenomenon or activity an artifact is designed to support, including its underlying logic, its failure modes, and the tacit assumptions that practitioners have developed through sustained engagement with the problem domain [42, 44].

This distinction matters because domain experts and end users tend to surface different kinds of design problems. End users typically identify usability issues, such as friction in the interface, confusion about functionality, and mismatches between the platform's assumed workflow and their actual practices. Domain experts are more likely to identify what might be called epistemological problems, in which the platform's design encodes a flawed model of the phenomenon itself, not just a flawed implementation of a correct model [48]. As we describe in this paper, one of the most consequential design changes in Phase C1 was of precisely this character, entailing a correction to the platform's implicit theory of how neighborhood observation and civic reflection work.

Prior work has also examined what happens when multiple groups of domain experts, with different professional backgrounds and institutional interests, are involved in the same design process [17, 41]. Such configurations introduce the possibility of expert disagreement, producing situations where domain knowledge points in conflicting rather than convergent directions. This dynamic was central to our experience in Phase C2 and informs our broader discussion of staged participatory processes.

3 MACHIARUKI AND MACHIZUKURI

Machizukuri, literally "town-building", refers to a grassroots approach to urban planning and community development that emphasizes participation and collaboration among residents, businesses, and local governments. Emerging in Japan in the 1960s as a citizen-led response to top-down government planning, machizukuri has since become an established framework for neighborhood-level civic engagement, encompassing a broad range of activities through which citizens participate in the improvement of their living environments [32, 36, 43, 47]. While rooted in the Japanese context, machizukuri shares conceptual ground with participatory planning traditions in other countries, including community-led neighborhood planning in the United Kingdom [31] and participatory urbanism movements in the United States [22], suggesting that the dynamics explored in this paper may resonate beyond Japan.

Within this broader tradition, machiaruki, literally "town-walking", refers to a specific participatory practice that typically serves as a point of entry into machizukuri processes. (As with machizukuri, similar traditions exist in other countries [5, 13].) A standard machiaruki workshop proceeds in three stages [54]: participants first explore their neighborhood in small groups, documenting observations and points of interest; they then reconvene to share and organize their findings, often using large maps or post-it notes; finally, a facilitated discussion helps the group reflect collectively on what they have observed. As a nationwide practice, machiaruki has no single fixed format — for example, workshops may be organized around a specific theme such as documenting historical remnants in the neighborhood, or left deliberately open-ended. A concept often considered related to machiaruki is Modernology (Kogengaku) [11, 35], an early twentieth-century Japanese intellectual tradition that treats the details and artifacts of everyday life as objects of systematic study, reflecting a similar orientation toward observation and curiosity as preconditions for understanding the built environment.

Crucially, machiaruki is designed to precede deliberation and decision-making. Its purpose is not to generate proposals or solutions, but to cultivate a shared familiarity with the local environment and to encourage participants to look at their everyday surroundings with renewed curiosity. Experienced facilitators typically discourage participants from making value judgments or jumping to problem-solving too early in the process, treating observation as an end in itself rather than merely an input to planning. This

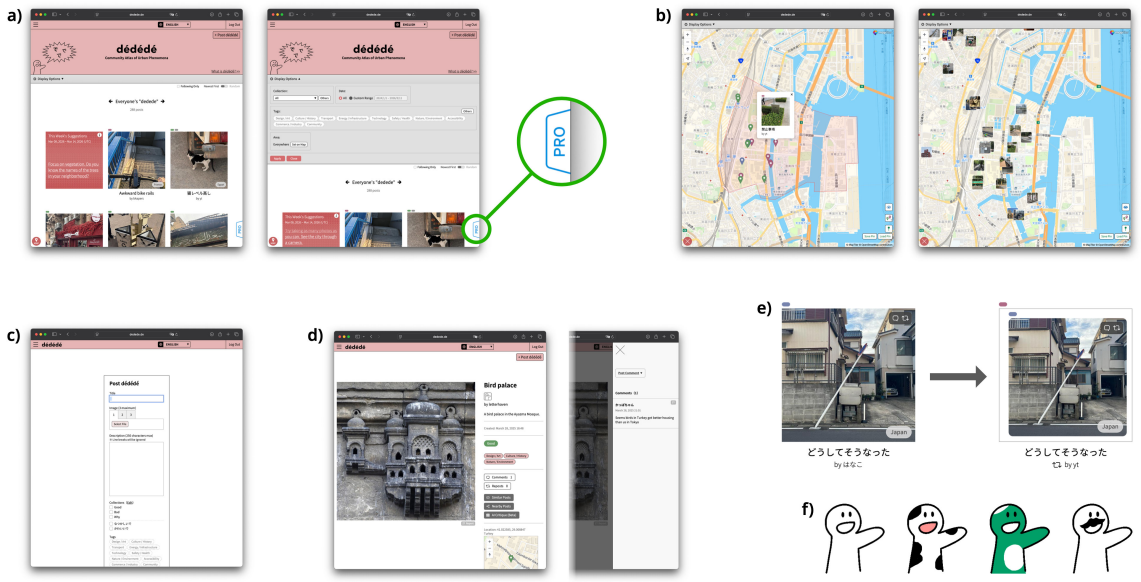

Figure 2: (a) The dédédé home page. Clicking the gray bar opens the control panel (right), from which posts can be filtered based on collection, date, geographic area, etc. Here, a small tab labeled "PRO" is visible at the bottom-right corner, denoting that the user is a designated institutional account holder with access to advanced AI features. (b) Interactive map view. Posts are displayed as markers; a "peek" feature temporarily converts all markers into thumbnails (right). (c) Post submission form. (d) Post detail page. Users can respond to posts in the form of comments, which are hidden in a sidebar reflecting the development team's decision not to foreground social features. (e) Uploaded posts can be "reposted" with additional commentary, offering another way to respond to other users' posts. (f) Users can customize the default avatar image using a painting interface. Using photographs as avatars is not permitted, again due to the development team's desire to deemphasize social signaling.

facilitated suspension of judgment is not incidental to machiaruki. It is instead central to its pedagogical logic, and as we describe in Section 5, it was a dimension of the practice that the technical team initially failed to appreciate in the design of dédédé.

The two practices are intended to support fundamentally different forms of civic engagement. Machiaruki operates in a low-stakes register, widely noted for being perceived as enjoyable and accessible, lowering the barriers to participation and inviting involvement from groups who might find formal planning processes intimidating. Machizukuri, on the other hand, involves higher-stakes deliberation and decision-making, requiring sustained engagement and a willingness to navigate conflicts of interest. Understood in terms of Arnstein's ladder of citizen participation [15], the transition from machiaruki to machizukuri represents a significant upward movement, from the lower rung of consultation toward the more empowered rungs of partnership and beyond.

Digital platforms designed to support these two practices therefore face fundamentally different design demands. Tools targeting machiaruki (which typically take the form of geotagged photo sharing apps [39, 49]) are optimized for ease and low friction, whereas tools for machizukuri [6, 7] require a richer feature set to accommodate the wider range of activities the practice entails. As we describe in this paper, navigating the boundary between these two sets of demands became a central challenge in the development of dédédé, as the platform's stakeholder community expanded to include both machiaruki and machizukuri experts.

4 PLATFORM OVERVIEW

Figure 2 shows the user interface of dédédé in its current, fully-featured form. Earlier versions of the platform, and the design decisions that produced them, are described in Section 5. The following provides an overview of the platform's core features.

Developed and operated as a nonprofit initiative, dédédé is a web-based civic media platform that invites users to document and share observations about their neighborhoods. The central unit of interaction is the post, which consists of a short title and a descriptive text, and can optionally include (up to three) photos, a sound recording, and location (latitude/longitude) information. Location data can be extracted automatically from photo metadata, read from the device's GPS, or entered manually using an interactive map embedded in the posting form. Users can also attach tags to improve searchability and organization, either selected from a set of ten base tags (e.g., "Design/Art", "Technology") or newly defined with arbitrary titles.

Each post can be assigned to any combination of three "collections": *good*, *bad*, and *why* (or *eedé*, *akandé*, and *nandé* in Kansai dialect Japanese; the name dédédé is a concatenation of the last syllables of these words). The *good* and *bad* collections are intended for posts describing positive and negative aspects of the neighborhood, respectively, while *why* is intended for posts describing aspects that users find puzzling or worth understanding, without overt value judgment. For example, a user might post a description

Figure 3: Initial prototype developed by the technical team. While functionally simple and built upon several naive assumptions about machiaruki reflecting the technical team’s lack of domain expertise, the overall user interface already resembled that of the platform’s latest iteration.

of a well-designed street bench as *good*, a street corner with numerous surveillance cameras as *bad*, and a perpetually vacant lot in a vibrant commercial district as *why*. As an advanced feature, users can define additional collections with custom names such as *dangerous* or *iconic*, to support machiaruki workshops organized around specific themes. While both tags and collections serve to categorize posts, they are intended for different purposes; tags are for objective, and collections are for subjective categorizations.

Posts are displayed on the home page in one of two views: a grid of thumbnails, ordered chronologically or randomly, reminiscent of image-sharing platforms such as Instagram or Are.na; or as color-coded markers plotted on an interactive map (clicking on a marker will open a popup containing the post thumbnail). A “peek” function allows all map markers to be temporarily expanded into thumbnail previews, enabling users to browse geographic distributions of posts while retaining visual context. Posts can be filtered by user, collection, tag, geographic region, upload date, and other criteria. While dédédé does not impose strict rules on the types of posts that can be shared, posts without location data have lower visibility on the platform, as they do not appear on the interactive map — a deliberate design choice that reflects the platform’s emphasis on grounded, place-specific observation.

Social interaction on dédédé is intentionally restrained. Users can comment on others’ posts and repost them with their own commentary, but the platform does not include likes/upvotes or other gamification features. This reflects a conscious decision to prioritize the quality and character of contributions over engagement metrics, and to avoid the dynamics that such features tend to produce on mainstream social media platforms.

A small number of AI-assisted features have been incorporated into dédédé. Each post is automatically analyzed to generate a short descriptive response text (referred to as “AI Critique”) and to surface other posts with similar content. Additionally, a summarization feature is available as a gated functionality, accessible only to city officials and other designated professionals, which generates text summaries of posts filtered based on specific criteria such as geographic area or time frame. The rationales for incorporating these AI features and for restricting summarization to designated professionals are discussed in Section 5.

The platform is implemented as a web application built on a Ruby on Rails backend, accessible through standard web browsers on any device. No native smartphone application has been developed; instead, the platform adheres to responsive design principles, providing a consistent feature set across desktop and mobile interfaces. The user interface supports both Japanese and English, though posts themselves can be written in any language.

5 DESIGN PROCESS

Below we present a detailed account of the design process, reconstructed from formal and informal documentation, online interviews with key collaborators, and the core team’s recollection. Interviews were conducted in Japanese, and all quotes appearing in this section have been translated into English by the authors. We acknowledge that some design reasoning was tacit at the time and difficult to recover with full precision in retrospect.

5.1 Project Beginnings

The project emerged from an acquaintance between the technical team and a group of urban designers, nonprofit employees, academics, and other professionals based in Kyoto and surrounding regions, all actively involved in regional urbanism. The latter group (we call this group *machiaruki experts*) had extensive experience organizing and facilitating machiaruki workshops of varied scope and scale in multiple cities; the technical team brought software engineering and UI/UX expertise. From this meeting of complementary skills, a collaborative project began to take shape — to develop a digital tool that could support machiaruki workshop practice. Crucially, the scope and form of this digital tool were left entirely to the technical team to determine. As we describe below, this arrangement carried significant consequences for the platform’s early design assumptions.

5.2 Initial Prototyping

Drawing on existing citizen science platforms such as iNaturalist [4, 14], and also on image-sharing and curation tools such as Instagram and Are.na, the technical team (consisting of three members) decided to develop a dedicated online platform for machiaruki workshops. The core concept was straightforward; the platform would allow participants to document observations during neighborhood walks in the form of posts, and visualize those posts both as a list and on an interactive map to support group reflection. To inform the design, the technical team conducted its own internal machiaruki sessions. At this stage, the posting interface supported text and photo (but not audio) uploads, collections were limited to *good* and *bad* (or *uncategorized*, for posts not assigned to either collection), and tags were yet unsupported. While functionally plain,

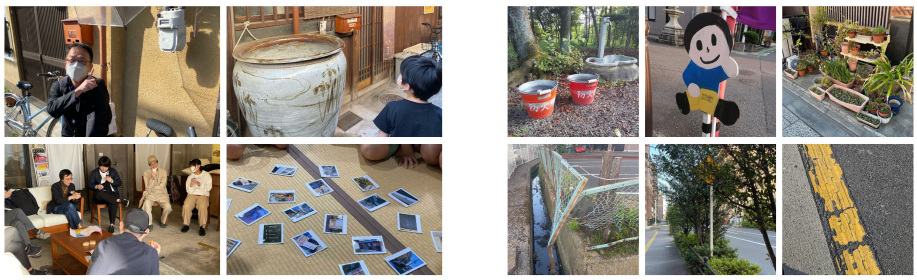

Figure 4: Several scenes from our Phase C1 workshops (left). Examples of photos uploaded through the workshops (right); images on the top row are from *good* posts, those on the bottom row are from *bad* posts.

the overall user interface including its aesthetic character already resembled that of the current platform (Figure 3).

Several foundational design decisions were made during this phase, entirely within the technical team. Most notably, the team made a deliberate choice to limit social and gamification features. The platform does not include "likes", reflecting ongoing discussions in HCI and UI/UX research about the potentially negative effects of such mechanisms on user behavior and content quality [20, 38]. Following other users is permitted, but follower and followee counts are not prominently displayed, requiring several clicks to access. User avatars are restricted to color variations of a shared character illustration, instead of personal photographs — another choice intended to reduce social signaling and keep the focus on content [56]. At this stage, the platform's interface was available in Japanese only, reflecting the team's expectation that it would be used primarily to support their own workshops in the local region.

These decisions produced a platform that was technically functional and internally coherent. However, as the subsequent phases reveal, the platform's design encoded several implicit assumptions about machiaruki practice that would prove to require revision once domain expertise entered the process.

5.3 Phase C1: First Co-design Phase

With a functional prototype in hand, the technical team and the machiaruki experts — twelve in total, although not all of them were present at every workshop — ran a series of workshops (Figure 4). Three sessions were held in central Kyoto, followed by three larger ones in the neighboring prefecture of Shiga, and a final session in Kobe. A total of over 200 participants attended these workshops (the fourth workshop was the largest, attracting 59 participants). The demographic composition of the participants varied markedly across sessions: some workshops were predominantly attended by university students, while others drew a broader mix of occupations and age groups. The organization, design, and facilitation of these workshops were largely delegated to the domain experts, drawing on their extensive experience; the technical team's main role during events was to give a short tutorial at the beginning of each workshop, and to ensure that the platform ran smoothly. The workshops adhered to common machiaruki formats, although details varied between sessions, e.g., whether to conduct the reflection session using only dédédé, or dédédé in combination with traditional tools such as post-it notes. Between and after workshops, the technical team and machiaruki experts exchanged observations and feedback. We also solicited input from participants in the form of questionnaires, though participant feedback proved less generative than expert dialogue, tending to center on usability improvements. The ongoing expert dialogue produced two significant design changes, as described below.

5.3.1 Inclusion of the "Why" Collection. As mentioned earlier, the initial version of the platform allowed users to categorize posts as either *good* or *bad* (or leave them as *uncategorized*); this binary framework was inspired by the familiar rating conventions on platforms such as YouTube. Domain experts, however, expressed immediate discomfort with this setup. As one expert recalls,

> This arrangement struck me as problematic — encouraging participants to quickly evaluate what they see as *good* or *bad* runs counter to the core pedagogical goal of typical machiaruki practice, which is to cultivate careful observation and an open, curious relationship with the urban environment. In fact, many workshop facilitators devote a substantial portion of their introductory sessions to actively discouraging participants from making premature value judgments.

In this light, the binary choice between *good* and *bad* was not just a simplification but an epistemological mismatch, encoding a model of civic observation that conflicted with the practice the platform was meant to support.

In response, the technical team introduced a third category, *why*, intended for observations that provoke curiosity or invite interpretation without committing to a value judgment (Figure 5, left). The feature was implemented after the first Kyoto workshop, and in subsequent sessions, *why* posts accounted for 20.1% of all submissions — a significant share given that it was a less intuitive category. More consequentially, the introduction of *why* visibly shifted the character of the posts being submitted, moving the platform away from a purely evaluative register and toward something closer to a discovery platform. Later, the collection system was further extended to allow users to define custom categories, as an attempt to accommodate themed workshops, e.g., sessions focused on identifying historical remnants or potential safety risks for children.

5.3.2 From Workshop Companion to Standalone Platform. The technical team originally conceived dédédé as a tool to support

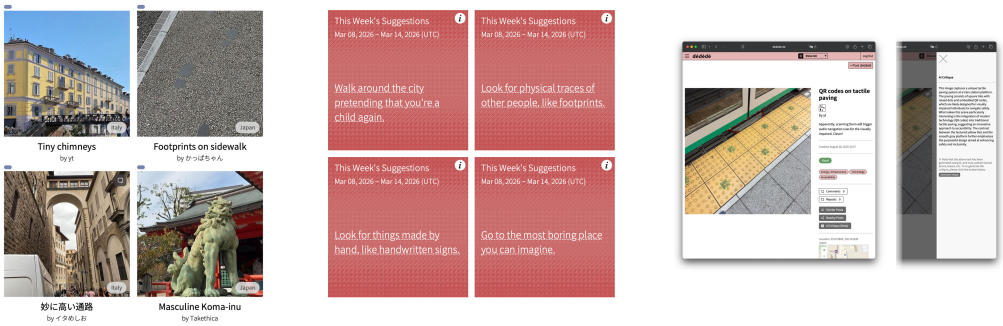

Figure 5: Main features added in Phase C1: the introduction of *why* as a new collection (left); the addition of "walking suggestions" to compensate for the lack of expert facilitation (center); an LLM-based "AI Critique" feature, which can be accessed via a click-to-open sidebar (right).

in-person machiaruki workshops, with the expectation that meaningful usage outside of workshop contexts would be limited to post-event reflection by organizers and participants. Workshop experience complicated this assumption in two ways. First, domain experts began to suggest that the platform had potential as a standalone urban observation tool independent of formal workshop settings, as an even more accessible, lower-barrier entry point to participatory urbanism than in-person machiaruki sessions. Second, we observed that reflection sessions that relied solely on dédédé proved less engaging than those that combined it with traditional, analog methods like post-it notes. The platform's visualization features were effective as a complement to existing methods, but less so as a replacement for them. To quote one of the experts,

> The energy just wasn't there for reflection sessions where dédédé was used in isolation. Even something as simple as printing out the uploaded photos using a portable printer (Fujifilm Instax) and laying them out on a table led to far more engrossing sessions than looking at a screen. It seemed clear that a web-based platform by itself cannot facilitate the communal aspects of in-person workshops.

These observations and feedback prompted a reorientation of the platform's design goals. Instead of optimizing exclusively for in-workshop use, the technical team began developing features to support asynchronous exploration and discussion, transforming dédédé from a workshop companion into a platform capable of supporting independent use. The platform was updated to surface related posts based on geographic proximity and content similarity, allowing users to encounter contrasting perspectives on the same place or phenomenon — for example, one user categorizing a graffiti-covered wall as *bad* while another categorizing it as *good*. Reflective discussion features, including commenting and reposting with added commentary, were introduced to allow users to respond to one another's observations. (However, consistent with the team's broader aversion to foregrounding social features, these discussion threads were made accessible via a click-to-open sidebar rather than displayed by default.) The platform's interface was also extended to support English alongside Japanese, reflecting a broadening sense of the platform's potential reach.

Another feature introduced to support independent use outside of in-person workshops with live facilitation was a "walking suggestions" box (Figure 5, center) on the home page, which offers prompts to encourage observational curiosity, e.g., "Go out at a different time of day, like early morning or late night" or "Look for accidental art, like beautiful paint spills". The goal was to replicate, in a lightweight way, the role that skilled facilitators play in motivating participants during in-person workshops, without resorting to gamification, social signaling, or other mechanisms that shift attention away from the act of observing neighborhoods.

Finally, an LLM-based "AI Critique" feature (Figure 5, right) was added that generates a short descriptive text response to each uploaded post. This idea faced some pushback internally, citing concerns that AI-generated text would dilute the authenticity of what was intended as a platform for human observation and reflection. Ultimately, the team concluded that if responses are restricted to purely descriptive text (avoiding evaluations or recommendations), the feature can be a net benefit to the platform by offering users additional perspectives on their uploaded posts. The feature remains marked as beta on the platform, reflecting a degree of ambivalence that has not been fully resolved.

5.4 Phase C2: Second Co-design Phase

As the project progressed, the platform began attracting the attention of a new category of urbanism experts, namely city officials and real estate developers. These institutional experts were interested in the potential of dédédé as a tool to support *machizukuri* efforts, and proposed orienting the platform toward obtaining more actionable data and soliciting concrete proposals from citizens. A series of four workshops, three conducted in Tokyo and the other in Kyoto, provided the immediate context for these discussions. (A total of eleven machizukuri experts were involved in the workshops; since for this phase each workshop was held with a different institutional partner, each expert was involved in exactly one session.) The demographic composition of the participants again differed widely between sessions, ranging from students to working professionals and long-term residents. The workshops still followed the machiaruki format, and were framed as trials through which we consider possible enhancements to the platform, with an eye toward its use in future machizukuri efforts. The expanded collaboration

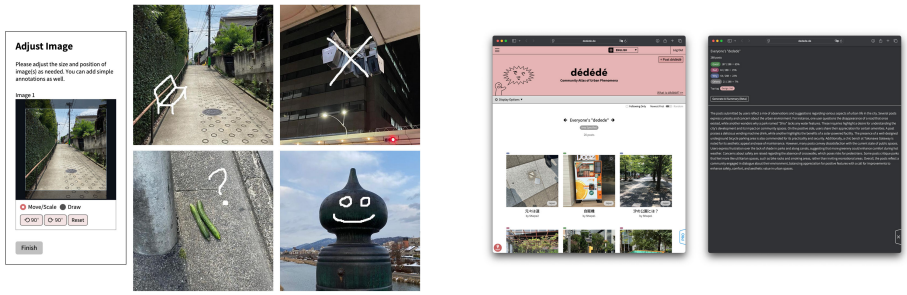

Figure 6: Main features added in Phase C2: a sketching interface that allows users to annotate posts with line drawings (left); an AI summarization feature, which can be accessed by clicking the "PRO" tab on the home page (right). AI summarization is only available to designated institutional account holders.

produced three design decisions, each reflecting a negotiation between the new collaborators' goals and the platform identity that had been established through Phase C1.

5.4.1 Allowing Proposal Submissions. Among the new collaborators, several experts belonging to municipal governments recommended extending the platform to allow users to submit proposals for urban improvements — suggesting potential uses for a vacant lot, for example — as such activities are a standard feature of municipally-run machizukuri workshops, where participants are often expected to move beyond observation toward active ideation.

The proposal was technically straightforward to implement, but provoked significant internal debate. Both the technical team and Phase C1 collaborators expressed concern that introducing explicit proposal functionality would shift the platform's fundamental character, moving its center of gravity away from open-ended observation and toward goal-directed problem-solving, while also adding complexity to the user interface that could raise barriers to casual participation. As a member of the technical team recalls,

> None of us were averse to the idea of supporting machizukuri workshops, but at this stage we already felt there was a unique feel to posts uploaded to dédédé that differentiated it from other civic technology platforms. We felt attached to that distinct character, and losing it would have been a pity.

As a compromise, the technical team introduced a lightweight sketching interface that enables users to annotate uploaded photos with simple line drawings (Figure 6, left). This allows users to gesture toward ideas and future visions, for example sketching a public bench into a photograph of an empty plaza, without restructuring the platform around a proposal submission workflow. For example, in a machizukuri workshop where participants propose possible solutions to perceived urban problems, the posts can be categorized as *bad* and the solutions depicted in the form of sketches.

The modification was minimal from both technical and interface design viewpoints, but was enough for dédédé to be approved for use in official machizukuri workshops. However, whether it will continue to satisfy the expectations of future institutional partners remains an open question, given that more complete proposal functionality is available on dedicated platforms like Decidim.

5.4.2 "Closing the Loop". A second suggestion, again from municipal employees, was the implementation of an official response system for cities to reply to users' posts or report on actions taken in response to them. Such "closing the loop" features are widely recommended in civic participation platforms as a mechanism for maintaining user motivation and demonstrating institutional responsiveness [27].

After deliberation across stakeholder groups, the team chose not to implement this feature. The central concern was that introducing official institutional responses risked importing a degree of formality that could induce self-censorship among users, irreversibly altering the platform's character — discouraging the playful, phenomenological observations that had come to define dédédé's contribution to the civic technology landscape. By this point, the platform had begun attracting sporadic posts from international users, further reinforcing the team's belief that the platform occupies a niche not addressed by existing alternatives.

5.4.3 Summary Generation. Experts from both municipal governments and real estate developers expressed a need for tools that would allow actionable knowledge to be quickly distilled from posts, e.g., to summarize the predominant concerns raised within a particular neighborhood during a given time period. The platform's existing visualization features, designed for reflective workshop and independent use where posts are examined one by one, were ill-suited to this kind of rapid aggregation.

To address this need, the team implemented an LLM-based summarization feature that generates text summaries of posts filtered by geographic area, time frame, user, collection, tag, and other criteria (Figure 6, right). However, the team decided to strictly gate the feature, restricting access to city officials and other designated professionals with special accounts. This decision was made on two grounds. First, team members expressed concern that prominently featuring an AI summarization tool risked misrepresenting the platform's non-commercial character and its emphasis on authentic, unmediated civic observation, particularly given the heightened public attention surrounding LLMs at the time. Second, members pointed out that making summarization a visible, public-facing feature might subtly influence users to write posts with an eye toward how they would be summarized, shifting the platform's epistemic culture in ways that were difficult to predict or reverse. Strictly

gating the feature was deemed to be an acceptable compromise that allows dédédé to serve institutional users while preserving the integrity of the platform's culture.

Taken together, these three design decisions illustrate a shift in the technical team's role in the collaborative process. Whereas in Phase C1 the team largely functioned as an implementer of ideas put forward by the domain experts (through a dynamic that we call *receptive redesign*), in Phase C2 they took on a more active role of balancing divergent opinions and evolving the platform while maintaining its character cultivated through Phase C1. This was a qualitatively different dynamic, which we characterize as *active negotiation and resistance.*

6 DISCUSSION

6.1 Staged Participation: Benefits and Risks

A recurring assumption in PD is that broader stakeholder involvement produces better outcomes; that more voices, engaged earlier and more continuously, yield more representative and legitimate designs [52]. Our experience complicates this picture, not by refuting it but by drawing attention to a variable that is underexamined in literature, i.e., the sequencing of stakeholder involvement.

By beginning with a focused group of machiaruki practitioners, the *receptive redesign* dynamic of Phase C1 allowed the platform's core identity to stabilize before institutional collaborators entered the process. The *why* category, the emphasis on curiosity over formal evaluation, and the deliberate restraint around social and gamification features were all established and validated through real workshop use before Phase C2 stakeholders introduced competing visions. When those visions arrived, the team had a principled foundation from which to evaluate them, engaging in *active negotiation and resistance* rather than either passive compliance or reflexive rejection. For instance, the decision not to implement loop-closing was not a matter of technical preference or resource constraints, but a reasoned judgment that the feature would undermine a platform identity that had been collaboratively constructed and empirically tested. In this sense, the accumulated design knowledge of Phase C1 functioned as a *design anchor*, a stable reference point that gave the team the capacity to engage with new expert demands critically instead of reactively.

This suggests that staged participation, even when unplanned, may carry structural advantages in civic technology development. When a platform's identity is established collaboratively among a relatively narrow group before a broader range of stakeholders enter the process, the subsequent negotiation can proceed on principled terms rather than devolving into a feature accumulation exercise driven by whoever holds the most institutional leverage.

However, we must also acknowledge that staged participation introduces a form of path dependency that carries its own risks. The platform that emerged from Phase C1 reflected the values and priorities of a particular group of practitioners, i.e., experienced machiaruki facilitators with a strong commitment to low-stakes, curiosity-driven urban observation. By the time Phase C2 experts joined the process, these values were sufficiently embedded in both the system design and the team's shared conceptualization of the platform that genuinely open negotiation about the platform's fundamental direction was no longer possible. Features that might have been foundational had they been proposed earlier, such as formal proposal workflows and institutional response mechanisms, were evaluated against a *design anchor* that had been set without input from the stakeholders who cared most about them.

It is worth asking, therefore, whose values are encoded by early stakeholder involvement, and who bears the cost of the resulting path dependency. In our case, there is a reasonable argument that in many regions, modern machiaruki practice tends to skew toward participants who are culturally engaged and inclined toward civic participation — a demographic that overlaps with what Florida [25] terms the "creative class". By anchoring the platform's identity in the values of practitioners serving this demographic, we may have inadvertently constrained the platform's capacity to serve communities for whom more structured, outcome-oriented forms of participation are more culturally appropriate or practically necessary. This is a structural risk of any staged participatory process, and is one that teams undertaking similar trajectories should attend to explicitly.

6.2 CS/HCI Professionals as Quasi-Neutral Design Mediators

A less commonly examined dimension of multi-stakeholder co-design is the role of the technical team itself as a social actor within the collaborative process. In much of the PD literature, technical practitioners are positioned primarily as knowledge holders who must be persuaded to share design authority with non-technical stakeholders [18, 24]. Our experience suggests a different and potentially complementary framing: in domain-specific civic technology projects, the technical team's status as domain outsiders can function as a form of productive quasi-neutrality, enabling them to serve as mediators between stakeholders with competing visions.

In Phase C1, the technical team entered the collaboration without meaningful expertise in the practice of machiaruki. This absence of domain knowledge, which might initially appear as a limitation, had an important social consequence. It allowed the team to engage in *receptive redesign*, responding to domain expert feedback in a posture of genuine receptivity, without the defensiveness that might accompany a team that believed it already understood the problem domain. Over time, this receptivity accumulated into trust — the domain experts came to believe that when the technical team accepted a recommendation, it was because the team had genuinely understood and endorsed it, and when they pushed back, it was for pragmatic not philosophical reasons. This asymmetry of perceived motivation proved consequential in Phase C2, where the team's objections to certain feature requests carried credibility precisely because their earlier receptivity had established their lack of a priori ideological investment.

We suggest that this dynamic points toward an underexplored role for CS/HCI practitioners in civic technology co-design — not merely as technical implementers or as equal participants in a democratic design process, but as structurally positioned mediators whose domain outsider status can, if consciously cultivated, enable more productive negotiation between stakeholders with competing domain expertise. This role is distinct from the facilitator role described in past PD literature [33, 46], in that it is grounded in the technical team's ongoing authorship of the artifact as opposed

to a detached facilitation of others' conversations. It is also worth noting that in our case, the nonprofit character of the project reinforced this role; the absence of commercial incentives meant that no stakeholder group could reasonably interpret the technical team's decisions as driven by financial interest. Teams operating in commercial contexts may find this form of perceived neutrality harder to establish and maintain.

6.3 Design Philosophy as Collaborative Output

A broader theoretical takeaway from our experience concerns the nature of design knowledge in civic platform development. For a platform like dédédé, which was built from mature, readily available technologies, the primary design challenge was not technical but philosophical — the difficulty lay in developing a shared, principled understanding of what the platform was for, who it was for, and what kind of civic engagement it was meant to support. We suggest that this is a characteristic feature of civic technology development, not an incidental one, and that it has consequences for how we conceptualize what co-design processes actually produce. While the canonical output of a design process is an artifact, in our view the most consequential product of Phase C1 was not any particular feature but a shared design philosophy that gave the team the capacity to act coherently under pressure in Phase C2. Co-design functioned here not only as a means of producing better artifacts, but of producing the knowledge necessary to defend them.

This has practical implications for how civic technology teams document and communicate their design reasoning. In our case, the philosophical understanding that accumulated through Phase C1 was largely tacit, held in the shared memory of the team instead of being written down anywhere. This served us well in Phase C2, where team members could draw on it fluidly in real-time negotiations. However, it also means that the reasoning behind some of our most consequential decisions is difficult to reconstruct with precision in retrospect. We suggest that civic technology teams undertaking similar processes would benefit from more deliberate practices of design rationale documentation [19, 40], as a means of making tacit philosophical commitments explicit enough to be examined, challenged, and ultimately transferred to new collaborators as a project evolves.

7 CONCLUSION

This paper presented a reflective case study of the design and development of dédédé, a civic technology platform that invites citizens to document and share urban observations as an accessible entry point to participatory urbanism. Through a non-participatory prototyping period followed by two successive co-design phases involving an expanding group of stakeholders (marked by the twin dynamics of *receptive redesign* and *active negotiation and resistance*), dédédé evolved from a bare-bones workshop support tool into a platform with a distinct and principled civic identity.

The trajectory of dédédé's development illustrates what we have called a staged participatory process, one in which collaboration expands gradually rather than beginning with a fully assembled stakeholder group. This staging was unplanned in our case, but proved deeply consequential. By establishing a shared design philosophy through an initial, focused collaboration with machiaruki practitioners, the team developed a principled foundation from which to evaluate (and in some cases resist) the competing visions introduced by later stakeholders. We argue that this dynamic, in which early collaborative knowledge accumulates into a *design anchor* for subsequent negotiation, represents a recognizable and undertheorized mode of civic technology development. While the canonical co-design model in which diverse stakeholders participate from the outset in a structured process remains a valuable ideal, many real-world projects follow messier, more fragmented trajectories, and the field would benefit from richer accounts of how design knowledge develops and functions in such contexts.

We have also argued that CS/HCI practitioners occupy a distinctive social position in domain-specific co-design projects; one that, when consciously cultivated, can function as a form of productive perceived neutrality enabling mediation between stakeholders with competing expertise and interests. This role is distinct from both the technical implementer and the PD facilitator as conventionally described, and deserves further theoretical attention.

This study has clear limitations. It reflects a single design case, developed in a specific cultural and institutional context, and we make no claim that the dynamics observed here apply universally. The reflective account is also subject to the limitations of retrospective reconstruction, in that some of the reasoning behind consequential design decisions was tacit at the time and difficult to recover with precision. Future work should examine whether similar patterns of staged collaboration emerge in other civic technology projects and co-design contexts more broadly, and should explore methodologies (such as contemporaneous design rationale documentation) that might make such processes more legible as they unfold rather than only in hindsight.

Finally, we note that dédédé continues to evolve. Future work will examine the platform's long-term usage patterns, and assess how the staged design process shaped the platform's eventual utility, both as a machiaruki/machizukuri workshop companion and as a standalone app.

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