

Sustainable Urban Revitalisation through Design: A Framework for Intervention Assemblages in Declining Streets

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Abstract:

Historic Japanese shopping streets (shotengai), such as the Edosaki district in Inashiki City, face socioeconomic decline, as evidenced by the pervasive “closed shutter” phenomenon. This study investigates how coordinated “intervention assemblages” can revitalise such communities by shifting the focus from isolated design actions to integrated systems. Utilising the Edosaki district Machiya Project a collaboration between the University of Tsukuba and Inashiki City we employed a design-led, studio-based platform to conduct a public social experiment. We simultaneously deployed four intervention types: identity markers (Ie-in), a visual gallery (Shutter Lab), social hospitality spaces (Omotenashi Caravan), and a memory preservation workshop (Yōkai Sugoroku). Our findings demonstrate that these coordinated micro-interventions generate synergistic effects that singular projects cannot achieve, including increased pedestrian dwell times and the transformation of vacant storefronts from “symbols of absence” into narrative cultural assets. Residents’ active requests to restore the traditional Family Mark indicate a successful rekindling of place attachment. We conclude that assemblage-based deployment provides a feasible, low-cost framework for “urban acupuncture”. This research reframes community revitalisation as an emergent outcome of layered, participatory, and temporally adaptive design actions embedded in everyday urban life.

Keywords:

Revitalisation, Intervention Assemblages, Urban Acupuncture, Place Attachment

1. Introduction

Neighborhood commercial streets (shotengai) are essential to urban life, serving as sites for social exchange and collective memory [1]. However, many small-scale districts—such as the historic Edosaki district in Inashiki City—face decline due to suburban competition and shifting demographics [2]. This deterioration is physically manifested in the “closed shutter” phenomenon, where vacant storefronts create barriers to pedestrian activity and erode local identity [3].

While conventional revitalisation often relies on large-scale redevelopment, smaller districts require micro-scale spatial activation [4]. Temporary, low-cost interventions—such as pop-up installations or facade transformations—offer a way to reprogram public behaviour through lightweight modifications [5]. Yet, much of the existing discourse treats these micro-interventions as isolated design actions [6]. This fragmented perspective fails to explain how multiple, concurrent interventions operate collectively to generate cumulative social effects [7].

This study addresses this gap by investigating revitalisation through the lens of “intervention assemblages.” We examine how a coordinated suite of four small-scale projects—the “Machi-Labs”—interact within a shared spatial framework to reshape place attachment [8]. Grounded in the Edosaki Machiya Project, a collaboration between Inashiki City and the University of Tsukuba, this research functions as an experimental field platform to test real-world urban design.

By analysing these parallel interventions as a design ecosystem, this study advances three primary contributions:

- (1) It proposes a typology framework for neighborhood activation, categorising interventions into identity, visual, social, and memory dimensions.
- (2) It demonstrates how assemblage-based deployment generates synergistic effects, such as the use of a “stamp rally” to connect disparate sites into a unified narrative.
- (3) It positions studio-based design as a viable research infrastructure for conducting situated urban experimentation.

Through this perspective, we reframe neighborhood revitalisation not as a product of structural redevelopment, but as an emergent outcome of layered, participatory design actions embedded within everyday life [9].

2. Literature Review

2.1. From Urban Revitalisation to Micro-Scale Activation

Conventional urban revitalisation strategies have historically focused on large-scale infrastructural redevelopment, economic investment, and long-term planning frameworks [10]. However, such approaches often face financial, administrative, and temporal constraints, particularly in small commercial districts experiencing gradual decline rather than abrupt collapse [11].

In response, scholars and practitioners have increasingly explored micro-scale activation strategies that operate through incremental spatial interventions [12]. These approaches prioritize immediate public engagement, perceptual transformation, and social reactivation over structural redevelopment [13]. Rather than replacing urban fabric, they seek to reprogram existing environments through lightweight design actions [14].

2.2. Tactical Urbanism and Urban Acupuncture

Two influential frameworks informing this shift are tactical urbanism and urban acupuncture [15].

Tactical urbanism emphasizes temporary, low-cost, and participatory interventions that enable rapid testing of spatial ideas in real urban contexts [16]. Such interventions

often include pop-up installations, temporary seating, street exhibitions, and micro-events designed to provoke new patterns of use [17].

Similarly, urban acupuncture conceptualizes cities as interconnected socio-spatial systems in which targeted small-scale interventions can generate disproportionate catalytic effects [18]. Rather than pursuing comprehensive redevelopment, this approach identifies critical urban “pressure points” where minimal interventions can trigger broader transformation [19].

Both frameworks foreground temporality, experimentation, and community engagement as essential revitalisation mechanisms [20].

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2.3. Design Research and Intervention-Based Inquiry

Within design research, intervention has emerged as a methodological mode through which knowledge is generated through situated action rather than detached observation [21]. Research through Design positions design practice as a form of inquiry capable of revealing latent dynamics within social and spatial systems [22].

Subsequent work has framed design interventions as exploratory probes that surface behavioural, cultural, and infrastructural conditions embedded in everyday environments [23]. From this perspective, interventions function not merely as solutions but as epistemic instruments capable of producing situated knowledge [24].

2.4. Studio-Based Urban Experimentation

Design studios have increasingly extended beyond pedagogical settings to operate as experimental urban laboratories [25]. By embedding student-led interventions within real communities, studios can facilitate rapid prototyping, participatory engagement, and iterative spatial testing [26].

Such studio-based urban experimentation enables multiple interventions to be deployed concurrently, allowing comparative observation of their social and spatial effects [27]. This multi-project structure offers a unique platform for examining how diverse design strategies interact within shared urban contexts [28].

2.4. Toward Intervention Assemblages

While tactical urbanism and urban acupuncture emphasize individual interventions, less attention has been paid to how multiple interventions function collectively as assemblages [29].

Recent design research suggests that spatial revitalisation outcomes may depend not on singular design solutions but on coordinated layers of activation operating across symbolic, social, and experiential domains [30]. Understanding revitalisation as an intervention assemblage shifts the analytical focus from isolated projects to systemic design ecologies [31].

This study builds upon this perspective by examining how a studio-based multi-project framework generated cumulative activation effects within a declining commercial street.

3. Methodology

3.1. Research Design: The Edosaki district Project

This study employs a design-led, studio-based research approach to investigate how “intervention assemblages” reactivate declining commercial streets [32]. We conducted the research through an urban design studio at the University of Tsukuba, which functioned as an experimental “Machi-Lab” (town laboratory) in collaboration with Inashiki City [33]. The project focused on the historic Edosaki district, a former castle town where growing vacancies and “closed shutters” have diminished street vitality. Rather than evaluating isolated designs, we examined a suite of four concurrent projects implemented between 1 September and 18 November 2011.



Figure 1. The existing urban fabric and commercial decay in the historic Edosaki district.

3.2. The Studio as an Experimental Platform

The “Machi-Lab” structure utilized 20 graduate students specialized in information, product, environmental, and architectural design [34]. This multidisciplinary team moved through iterative cycles of field observation, problem reframing, and on-site prototyping [35]. By situating the studio within the community, we transitioned from speculative exercises to situated interventions embedded in daily life. The research process culminated in a public social experiment on 18 November 2011, which used a stamp rally format to guide residents through the various intervention sites.

3.3. Intervention Typology Framework

We deployed four distinct intervention types to address different “activation layers” of the Edosaki district environment:

Table 1. Four workshop groups and different types.

Activation Dimension	Project Name	Intervention Focus
Identity	Ie-in (Family Marks)	Reviving traditional shop symbols using silk-screened banners hung under arcades.
Visual	Shutter Lab	Utilizing closed storefronts as street galleries for historical “then-and-now” photography.
Social	Omotenashi Caravan	Creating temporary hospitality spaces with a 1/500 scale town model, tea, and charcoal braziers.
Memory	Memory Inheritance	Facilitating participatory workshops to record oral histories and transform them into local “Yōkai” characters.

3.4. Data Collection and Analytical Approach

We gathered primary data through direct observation and systematic documentation during the “Machi-Lab” social experiment [36]. Materials included: (1) Field notes and photographic records of pedestrian behaviour. (2) A 1/500 scale white model of the district used to solicit resident feedback via post-it notes. (3) Participant responses from the stamp rally and oral history workshops.

The analysis follows a qualitative comparative framework [37]. We performed a cross-case synthesis to identify synergistic effects—how the visual presence of noren (identity) combined with the social gathering around the town model (hospitality) to reshape resident perceptions of the district.

4. Results and Findings

We analysed the studio projects through a typology framework to evaluate how the four concurrent interventions collectively contributed to street revitalisation in the Edosaki district. Rather than treating each initiative as an isolated outcome, we categorised them according to their primary activation mechanisms and examined their individual and synergistic effects.

4.1. Identity Activation: The Ie-in (Family Marks) Project

This project reinforced local identity by reviving traditional shop signs as visual markers. Thirteen silk-screened banners (noren) were produced and hung under the shopping arcades to unify fragmented storefronts. These markers functioned as cultural signifiers, transforming the district’s image from a declining zone into a culturally distinctive place. During the experiment, residents expressed a desire to rediscover their own family marks, suggesting that these symbolic installations successfully rekindled place attachment and a sense of shared heritage.



Figure 2. Field Implementation of the Design-Led Intervention Assemblages in Edosaki.

4.2. Visual Activation: The Shutter Lab

The Shutter Lab repurposed closed storefronts into street galleries displaying historical “then-and-now” photography and archival maps. Passers-by slowed their walking pace and engaged in spontaneous conversations about the street’s history after viewing these displays. By reframing “closed shutters” from physical indicators

of economic decline into sites of narrative presence, the intervention mitigated the negative visual impact of vacancy and transformed absence into a valuable aesthetic and cultural platform.

4.3. Social Activation: The Omotenashi Caravan

Installed in front of the Yaoden store, the Omotenashi Caravan created temporary hospitality spaces using charcoal braziers (shichirin), tea, and a 1/500 scale town model. This setup encouraged residents to gather, share food, and discuss the town's future. Observations recorded significantly increased dwell times and clustering of pedestrians around the model, which served as a tangible catalyst for social interaction and reoccupied previously inactive street edges.

4.4. Memory Activation: The Yōkai Sugoroku

Participatory workshops recorded oral histories from long-term residents, which were transformed into 31 unique “Yōkai” characters and integrated into a Sugoroku board game for local children. This process facilitated intergenerational dialogue, allowing elderly residents to share memories with youth. By gamifying collective history, the intervention ensured the district's memory remains accessible to the next generation.

4.5. Synergistic Effects and Overall Impacts

While individual interventions produced localised effects, their concurrent deployment generated cumulative activation effects. The stamp rally format integrated these layers into a unified “Machi-Lab” ecosystem: *Ie-in* banners established visual coherence, the Shutter Lab sustained pedestrian attention, the Omotenashi Caravan provided social infrastructure, and Yōkai Sugoroku reinforced memory and place attachment. Key behavioural shifts included increased dwell times (especially near the Yaoden store), reframing of vacancy as narrative presence, and residents' active requests for traditional marks revival. These patterns demonstrate that micro-scale, coordinated interventions can recalibrate public space usage and perception even in economically constrained settings.

5. Discussion

5.1. From Isolated Actions to Intervention Assemblages

Our findings in the Edosaki district demonstrate that neighborhood revitalisation succeeds when interventions operate as a coordinated assemblage [38]. While singular projects produce localised benefits, the concurrent deployment of the *Ie-in*, Shutter Lab, and Omotenashi projects created a unified narrative environment that a single installation could not achieve [39]. This supports the argument that revitalisation benefits from “Machi-Lab” strategies where symbolic, spatial, and social layers overlap to reshape public perception. Rather than functioning as discrete solutions, these interventions formed an interconnected system capable of recalibrating behaviour across the entire district [40].

5.2. Multi-Layered Activation Mechanisms

The Edosaki typology reveals four interdependent mechanisms that address the “closed shutter” crisis. Identity activation through silk-screened *noren* established visual coherence, while visual activation via the Shutter Lab transformed vacancy into

a narrative gallery. Simultaneously, the social activation of the Omotenashi Caravan reintroduced interpersonal exchange at private thresholds. Finally, memory activation—specifically the Yōkai Sugoroku—strengthened place attachment by converting oral histories into intergenerational play [41]. These layers shifted the street’s identity from a site of economic decline to a platform for social presence [42].

5.3. Temporality as a Design Resource

The interventions utilised temporality as a strategic resource rather than a limitation. By focusing on the one-day social experiment on 18 November 2011, we employed provisional installations like bamboo frames and magnetic photo displays [5]. This approach lowered implementation barriers and allowed for rapid prototyping in an environment where permanent redevelopment is financially unfeasible. Our results align with tactical urbanism models, showing that small-scale, temporally adaptive actions can reduce stakeholder resistance and invite community experimentation [43].

5.4. Reframing Revitalisation Metrics

Traditional frameworks often prioritise economic indicators like retail revenue, but our study suggests that behavioural and experiential metrics are more immediate signs of vitality [44]. We measured success through increased pedestrian dwell times at the Yaoden store and the emergence of conversational clusters around the 1/500 scale town model. Residents’ requests to have their own family marks rediscovered indicate that symbolic recognition and social vitality can precede and potentially catalyze economic recovery.

5.5. Studio-Based Research as Urban Laboratory

This research positions the design studio as a vital methodological infrastructure for situated knowledge production. By embedding 20 University of Tsukuba students specialized in information, product, and environmental design within the Edosaki community, the studio functioned as a real-world “Machi-Lab”. This hybrid positioning enables rapid deployment and multi-scalar experimentation that conventional planning frameworks lack. Ultimately, such models expand the urban design repertoire by treating declining neighborhoods as active sites for participatory research.

6. Conclusions

6.1. Key Contributions: The “Machi-Lab” Assemblage

We investigated how a studio-based intervention assemblage activated the historic Edosaki district. By deploying four parallel strategies—identity (Ie-in), visual (Shutter Lab), social (Omotenashi), and memory (Yōkai Sugoroku)—this research demonstrates that coordinated design systems reshape public engagement more effectively than isolated projects. This study reframes neighbourhood revitalisation not as a singular architectural fix, but as a programmatic ecosystem of layered, participatory actions.

6.2. Design Implications for Declining Districts

Our results offer five transferable principles for activating constrained urban environments:

- Integrating Symbolic and Functional Design: Reviving traditional *Ie-in* (family marks) unifies fragmented storefronts while restoring cultural identity.
- Sequencing Activation Layers: Using a stamp rally format ensures that visitors experience the street as a continuous narrative rather than a set of disconnected points.
- Leveraging Temporality: Low-cost, temporary installations—such as magnetic shutter galleries and bamboo frames—lower implementation barriers and encourage community experimentation.
- Embedding Participatory Memory: Converting oral histories into playable formats like the *Yōkai Sugoroku* board game fosters intergenerational dialogue and place attachment.
- Reclaiming Street Edges: Activating the “*misesaki*” as social infrastructure converts private thresholds into semi-public zones for interpersonal exchange.

6.3. Limitations and Future Research

This study utilized a single experimental context in Edosaki district and relied primarily on qualitative observations. To validate the “Machi-Lab” model, future research must pursue longitudinal impact studies to evaluate the permanence of these behavioural shifts. Additionally, integrating economic outcome analysis and conducting cross-district comparisons will help determine how this framework adapts to different demographic and commercial pressures.

Furthermore, it reflects conditions observed during the 2011 studio intervention period. While the district may have undergone subsequent changes, the analysis focuses on design processes and intervention mechanisms rather than long-term urban outcomes.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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