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Architecture That Never Finishes: Growing Tectonics and the Aesthetics of Patchwork in Subsidized Housing

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Abstract

Often dismissed as mere design failure or improvisation, the patch work ("patchwork") practice in subsidized housing is reinterpreted here as a form of adaptive, participatory, and contextually responsive growing architecture. Through a critical-reflective qualitative approach and field observations at Perumahan Rowosari Megah Asri 2, Semarang, this article highlights how residents gradually modify spaces using flexible, experience-based strategies. The concept of tectonics frames this practice as an open system—where structure, materials, and spatial expression unite in a non-finalized process.

Patch work emerges as an alternative architectural manifestation that resists formal conventions yet organically responds to living dynamics. These findings challenge conventional design paradigms, advocating for more flexible, contextual, and sustainable approaches. This work invites architects, developers, academics, and policymakers to reassess perceptions of "messy" architecture and recognize it as a source of inclusive, realistic future design strategies.

Keywords: Growing tectonics, Subsidized housing adaptation, Patchwork aesthetics, Open building systems, Incremental architecture.
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INTRODUCTION

Subsidized housing has long been a primary solution for fulfilling low-income communities' residential needs, alleviating economic burdens through affordable rental options. This proves particularly crucial in high-cost housing areas (Choi & Soave, 2025). Furthermore, subsidized housing stimulates economic development and job creation, exemplified by South Africa's approach of leveraging housing subsidies to meet demand while driving economic growth (Ojo-Aromokudu et al., 2020).

Field observations, however, frequently reveal developer-built housing undergoing unplanned expansion ("growth") despite original designs lacking such intent Akmal, 2011 in (Nelza et al., 2021). Constrained floor areas, design homogeneity, and the absence of consciously planned spatial growth systems compel residents to implement diverse spatial adaptations. These adjustments occur incrementally with an improvisational character, yielding heterogeneous spatial additions. The process employs flexible design strategies without predetermined plans, generating unique systems that defy standard categorization (Zhuang & Hua, 2017).

As Zhuang asserts, such phenomena are often misperceived as design failures or deviations from architectural standards. Yet in reality, our surrounding spaces perpetually transform—a condition we should view neutrally. Architecture transcends being a mere end-product of initial concepts; it constitutes an ongoing process encompassing conception, construction, use, and transformation, potentially triggering new cycles of design and construction. The built environment's influence manifests through users' interactions—where they accept, adapt, integrate, or even resist and modify spaces to meet their demands (Zhuang & Hua, 2017).

Upon closer examination, however, this informal practice reveals inherent spatial, constructive, and social logics worthy of interpretation as an expression of growing architecture. This article introduces an architectural approach distinct from conventional formal methodologies typically taught in design schools—which tend to be linear and unidirectional.

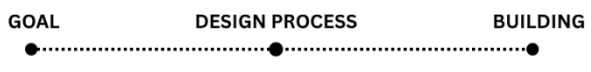
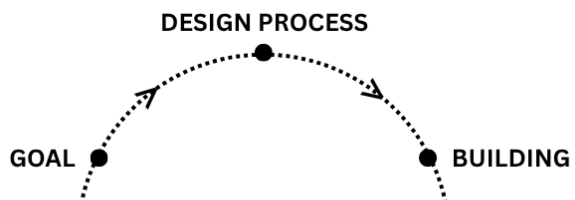


Figure 1. Diagram of Formal Architectural Process with Linear Flow, Architect as Central Actor Representing the Rationalist Approach
Source: Author, 2025



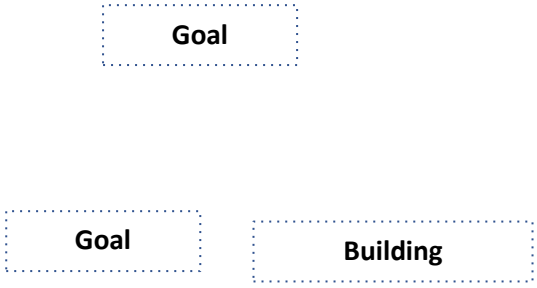


Figure 2. In the Patchwork Process Diagram Manifesting an Open System: The architectural product is viewed as an ongoing process—not ceasing upon initial construction completion—but continually modified by time and users, resulting in a Circular Process. Here, the architect acts as a facilitator, while occupants serve as the primary decision-makers
Source: Author, 2025

Framing *patch work* as a manifestation of open building systems, we propose its preliminary reading through the lens of tectonics as a gradual, adaptive, and contextual process. We term this "patchwork architecture"—a concept intentionally employed to represent informal architectural forms that defy formal design canons.

This article aims to explore the potential of *patch work* architecture as a representation of informal growing systems that have received scant attention in architectural discourse. By reframing this phenomenon through the dual lenses of tectonics and open-system principles, it seeks to stimulate discourse on occupants' active role in adaptively, participatorily, and contextually shaping and developing their living spaces.

Theoretically, this work contributes to recognizing user-led domestic space modifications as legitimate architectural processes. Beyond this, its broader significance lies in challenging conventional design paradigms—often characterized by closed, mono-directional approaches—while advocating for more flexible design methodologies. Such methodologies would embrace long-term spatial dynamics and align with inhabitants' socioeconomic realities.

RESEARCH METHODOLOGY

This article employs a qualitative interpretative approach with a reflective-critical strategy in examining the phenomenon of subsidized housing. The study is conducted through a theoretical literature review on incremental architecture, tectonics, and open systems, which is then enriched with limited field observations used as illustrative support.

The site of observation is located in Rowosari Megah Asri 2 Housing Complex, Semarang City, which demonstrates the phenomenon of incremental spatial growth through patchwork modifications by its residents. Several housing units were observed visually through photographic documentation and analytical sketches, aiming to capture spatial characteristics, simple construction techniques, and patterns of spatial improvisation.

This observation is not intended as a primary case study or comprehensive empirical research, but rather as an effort to reinforce the theoretical reading of informal architectural practices within the context of subsidized housing.

RESULTS AND DISCUSSION

Incremental Housing and Ever-Evolving Architecture: A Response to Rigid Design

Architecture as an evolving process refers not only to the physical expansion of built form, but also to design principles that respond to the dynamic lives of its occupants. In this context, the concept of incremental housing emerges as a concrete manifestation of architecture that remains open to change, allowing space to evolve over time in response to shifting needs.

Incremental housing refers to a housing system that allows for the gradual addition or

modification of spaces, in accordance with the changing needs of occupants and their evolving financial capacity (Rangel, 2016). In Indonesia, this concept is widely applied in the context of public housing, including subsidized housing. These subsidized units are typically designed as affordable dwellings with minimum specifications; however, they often compel residents to modify or expand the space to accommodate their actual needs.

Studies by (Silfia Mona Aryani et al., 2016) and (Nelza et al., 2021) indicate that subsidized housing frequently undergoes unplanned spatial growth, as residents adapt their homes beyond the original developer's layout. This phenomenon reveals that incremental housing is not merely a reflection of spatial necessity, but also a form of resistance against rigid and uniform design.

Figure 3. A patchwork renovation carried out by residents of subsidized housing in Semarang, as a form of spatial intervention to adapt their homes to evolving household needs.
Source: Author, 2025

In this context, the Supports and Infill theory proposed by John Habraken becomes highly relevant. Habraken emphasizes the importance of separating permanent structural elements (*support*) from the changeable interior elements (*infill*) (Cassim Shepard, 2023). This concept grants residents autonomy to transform their living environments according to changing needs and life circumstances. Although this system is not formally applied in subsidized housing in Indonesia, many post-occupancy spatial modifications reflect the spirit of an open system: spaces that are not locked into fixed functions, structures that allow for extensions, and facades that can be personalized.

Thus, the principle of an open system is not only applicable to detached houses but can also be extended to vertical housing such as low-cost apartments or micro-housing units, which require long-term spatial flexibility.

This principle is not only relevant in terms of user agency and spatial adaptability, but also invites critical reflection on how structures should be conceived—not as final and fixed forms, but as frameworks capable of accommodating change. At this point, the concept of tectonics in architecture finds its conceptual intersection.

Classically, tectonics is understood as the close relationship between structure and form, as articulated by Gottfried Semper. This understanding was later expanded by Kenneth Frampton (1995) within the context of modern architecture, highlighting the importance of material honesty and the expression of construction as part of both aesthetic and ethical value in architecture. Tectonics

represents the holistic integration of structural elements and design—not only functioning technically, but also carrying cultural and aesthetic meaning (Al-Alwan & Mahmood, 2020). In this view, tectonics is often referred to as the "poetry of construction," highlighting the expressive and emotive capacity of structural elements (Schwartz & Chad, 2017).

However, in the context of incremental or evolving architecture, tectonics is no longer merely about completed and harmonious form. Instead, it reflects a process that unfolds gradually—adaptively and often improvisationally. By understanding tectonics as an open system—always in a state of becoming, rather than a fixed end product—the relationship between structure and spatial transformation becomes a dynamic field of expression. In this framework, tectonics and open systems are not opposing approaches, but mutually reinforcing in imagining architecture as something that is always growing, evolving, and full of potential for change

Patchwork as a Concept: From Fabric Scraps to Flexible Space

The term "patchwork" is often used to represent the act of composing from imperfection—namely, assembling diverse elements in an eclectic and situational manner. According to the *Kamus Besar Bahasa Indonesia* (KBBI), patch work *(tambal sulam)* is defined as the act of repairing something (such as a house) in a partial manner, typically by replacing only the damaged parts (KBBI Daring, 2025).

Culturally, the term carries rich connotations, frequently associated with domestic life, childhood memories, and a form of social aesthetics rooted in improvisation. In textile art, for instance, patchwork quilts are often crafted to weave together personal memories and the meaning of home (Fernandes da Silva & Cristiane A, 2022)

Figure 4. The art of patchwork in fashion, demonstrated through the modification of a hoodie using various fabric scraps and a repurposed vest, results in a renewed and uniquely expressive garment.
Source: https://www.etsy.com/listing/4300546517/1-of-1-reworked-upcycled-nike-batik?ls=r&ref=items-pagination-1&cns=1&content_source=66b6748ac0f09e512c2174c8f8b3398bbe7b5305%253A4300546517&logging_key=66b6748ac0f09e512c2174c8f8b3398bbe7b5305%3A4300546517, Accessed on June 3, 2025

Though originating from textiles, this concept extends to architecture to describe an adaptive approach to space—responding to needs with available resources. In *Studies in Tectonic Culture*, (Frampton Kenneth, 1995) underscores that the archetypal root of all built forms lies in textiles. Anthropologically, the art of building owes debts to applied arts through motifs, assembly methods, and material sensitivity. This aligns with Botticher's view of true tectonics not as stylistic appearance, but as the essential spirit behind a work's visual form.

Within architecture—particularly in constrained environments like subsidized housing—*patch work*'s ethos reframes building practices. Where patchwork is often dismissed as emergency

improvisation or design failure, tectonic interpretation reveals deeper meaning: a manifestation of the dynamic relationship between structure, materials, and evolving living needs.

Tectonics in Patchwork Practice: Between Constraint and Creativity

In *patch work* architecture, tectonics emerges as a unique spatial and constructive narrative born from the intersection of limitation and creativity. In subsidized housing contexts, tectonic expression no longer manifests as cohesive aesthetic compositions typical of professional works, but as pragmatic modifications enacted incrementally by residents. Additions are often built with simple or semi-permanent techniques, using locally sourced—even recycled—materials, designed to address urgent emerging needs.

Figure 5. Repurposed fencing finds new life as an improvised door grip, deliberately positioned off-kilter. The raw junction between concrete and iron isn't a flaw, but a material strategy: navigating constraints with a 'sufficiently-safe' principle. This is the essence of living tectonics – where aesthetics emerge directly from urgency.
Source: Author, 2025

Similar expressions of spatial adaptation emerge in informal settlements across dense urban areas—from terraced houses and unplanned linear communities to post-occupancy modifications in multi-story housing units. Within these environments, residents demonstrate remarkable ingenuity: reconfiguring spatial divisions, transforming corridors into kitchens, or adding structural elements like cantilevered drying racks. These modifications reveal an intuitive structural awareness, even when deviating from original design parameters. Such informal spaces host adaptation strategies shaped by flexibility, practicality, user negotiations, and constructive improvisation—constituting a sustained response to evolving lifedynamics (Ahmed, 2020)

Nevertheless, it is crucial to acknowledge that not all patch work practices automatically yield positive architectural value. In numerous cases, modifications executed without adequate structural planning or technical understanding can trigger serious consequences—ranging from building collapse risks and visual environmental degradation to the emergence of unhealthy living conditions.

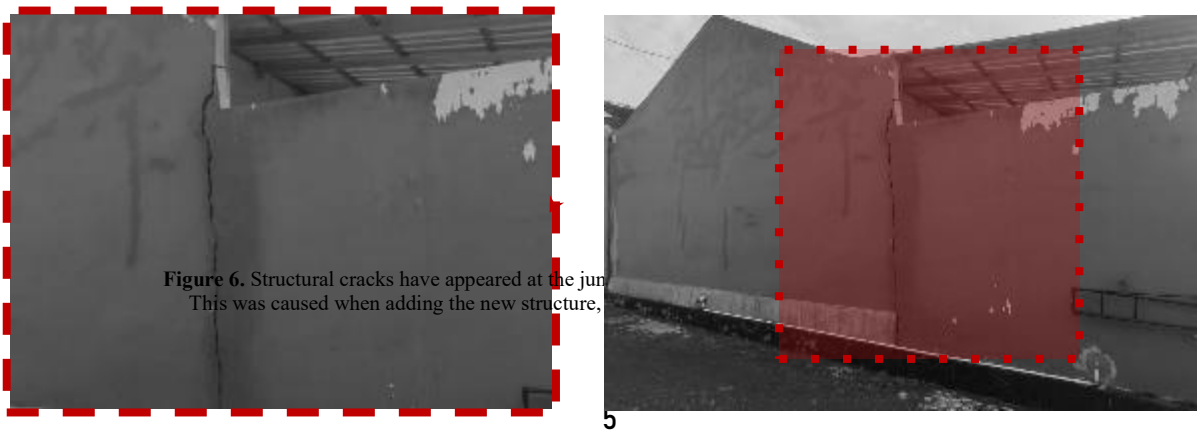


Figure 6. Structural cracks have appeared at the jun
This was caused when adding the new structure,

garden planter brickwork without additional foundation reinforcement.
Source: Author, 2025

In this situation, patchwork is no longer a form of creative expression, but rather a symptom of a system failing to provide safe and decent space to grow. Therefore, the reading of this practice must be done critically and contextually—avoiding the glorification of improvisation, while still opening space for future design transformation.

The Spatial Strategy Behind Irregularity: Rereading the Aesthetics of Patchwork Architecture

Patchwork architecture is often perceived as an informal form of architecture that disregards formal design principles. However, in recent studies, such as those by (De Paris & Lopes, 2018), this practice can be understood as a form of social expression reflecting users' adaptive capabilities and creativity in modifying space according to their needs. The tectonics and variety of acculturation in residential architecture reflect the diversity of forms and identities born from the convergence of various cultural influences. This architecture represents the outcome of a process of blending and adaptation, where building forms evolve based on local values, functional needs, and ever-changing social and historical contexts (Fauzy, 2017). Patchwork is not merely random aesthetics, but a spatial strategy that is reflective of economic realities, land constraints, and local cultural values. In this context, patchwork architecture becomes relevant to be interpreted through the lenses of tectonics and open systems.

Patchwork in Subsidized Housing: Field Study as Theoretical Reflection

Patchwork practices represent an adaptive strategy by residents in subsidized housing. While subsidized housing itself is designed as an affordable solution with minimum specifications, it ironically often necessitates spatial adaptation by its occupants. Observation results indicate that nearly all housing units observed in Rowosari Megah Asri 2 exhibit spatial growth—occurring at the front, rear, and sides of the main building.

Tabel 1. Contrasting pre-modification and post-modification housing conditions in resident-led patchwork adaptations

Standard Condition from Developer	**House After Owner Modifications**
	
Source: Author's Documentation,2020	*Source: Author's Documentation,2025*

Source: Author, 2025

Consistent with findings by (Silfia Mona Aryani et al., 2017), house expansions tend to maintain existing zoning, enlarge semi-public and service areas, prioritize rear-yard development, and show low priority for vertical expansion. In the observed cases, rear areas are typically utilized as kitchens or additional service spaces, while front areas are frequently transformed into commercial spaces, guest reception areas, or house identity markers. This growth occurs incrementally, contingent upon economic conditions and respective family needs.

Figure 7. Modifications across various houses, employing diverse methods, forms, purposes, and n he construction knowledge of local builders.

Source: Author, 2025

In material terms, a combination of new and recycled materials was observed. Aerated lightweight concrete blocks, light steel frames, Galvalume sheets, wood, hollow steel sections, and ventilation blocks (roster) were predominantly employed. Construction techniques tended to be simple and inherently improvisational, indicating residents' reliance on the skills of local laborers and personal experience.

Figure 8. Observable from frontal and lateral viewpoints, dwellings with patchwork modifications to forecourt and rear zones exhibit significant morphological changes through diverse additive elements, yet maintain clear legibility of their original core architectural volume.
Source: Author, 2025

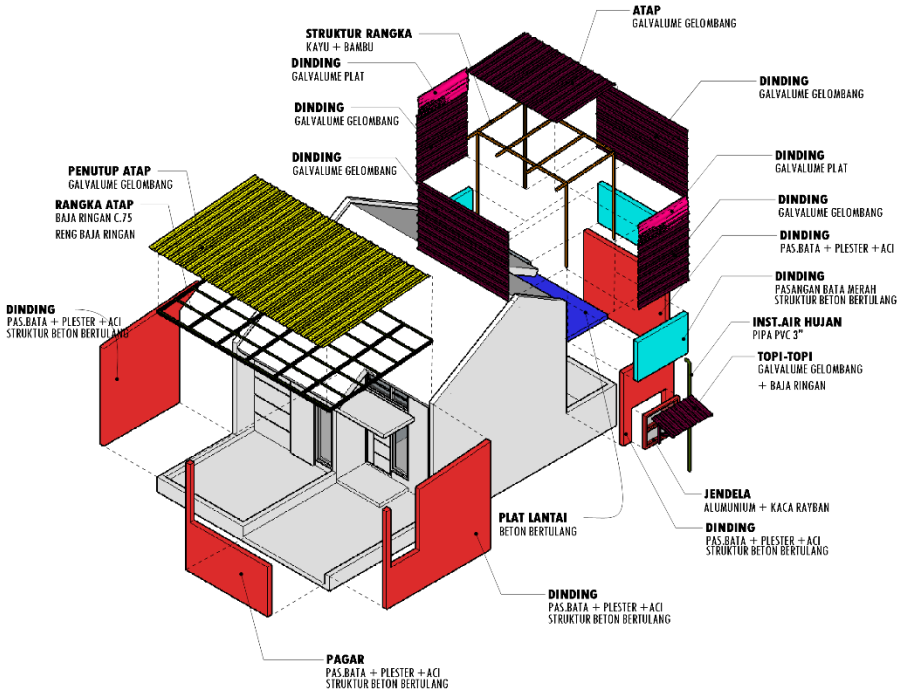


Figure 9. An exploding diagram illustrating modification elements applied to the house *(in Figure 7)*
Source: Author, 2025

Patchwork as an Expression of Open Systems

Discussion of these findings reveals that patchwork is not merely a response to initial design limitations,

but reflects a living architectural system. Additional spaces grow organically alongside residents' changing life dynamics. This aligns with Habraken's open building principles, where users possess autonomy to adapt their spaces. Patchwork can also be interpreted as informal tectonic expression: materials are arranged according to function and availability, joints follow practical logic, and final forms—while not always symmetrical—remain honest to the process.

Patchwork practices should not be superficially replicated as design solutions, but understood as a neglected source of architectural knowledge. Behind its irregular expression lies contextually adaptive strategies rooted in local wisdom. It reflects occupants' functional spatial adaptations despite resource constraints and lack of formal design support.

Through the lens of tectonics as open systems, we can formulate design approaches more responsive to lived realities rather than idealized plans. This methodology emphasizes gradual, small-scale adjustments over radical innovations like total demolition or rebuilds. Transformation occurs slowly and organically—responding to new needs without erasing historical traces.

Though the resulting architectural expression appears ordinary, non-uniform, and seemingly temporary, this strategy proves efficient in urban contexts. It offers tangible solutions to cost, spatial needs, and programmatic changes. These fluid adaptations resist categorization yet effectively resolve functional demands, demonstrating how patchwork is rooted in adaptive vernacular principles focused on improving living quality.

Nevertheless, this practice cannot rely solely on partial short-term improvisation. A flexible yet directed methodology is needed to prevent patchwork from becoming random adjustments without orientation. Narrative, concept, form, material, technique, and technology selections must prioritize efficiency and contextual relevance. Compliance with mainstream architectural conventions is unnecessary when solutions prove relevant, functional, and community-adoptable.

Ironically, while patchwork is ubiquitous in subsidized urban housing, developer-built housing rarely anticipates or accommodates such adaptations. Developers frequently adopt styles from design references yet ignore living local knowledge.

Formulating Design Guidelines from Patchwork Practices

How then do we develop design frameworks based on patchwork practices? Every design should begin with clear objectives and relevant technology. Designers must actively select strategies from diverse sources, applying them contextually while considering efficiency and utility. Facing future uncertainties—whether spatial needs or construction technologies—demands synthesizing standardized fabrication systems with local builders' skills. This synergy can yield flexible, adaptive design strategies with long-term positive impact (Zhuang & Hua, 2017).

Aligned with this, Zhuang and Hua emphasize restraining excessive creative impulses in everyday building renovations. Rather than creating entirely new forms, they advocate approaches prioritizing implementation and refinement over reinvention. This methodology can unearth the hidden potentials of everyday life—an intrinsic strength often overlooked by conventional architecture.

CONCLUSION

The emergence of patchwork architecture in subsidized housing reflects spatial dynamics that are not merely adaptive, but also embody tectonic values worthy of architectural interpretation. Gradual occupant modifications create a living architecture—responsive to actual needs and unconstrained by rigid formal designs. By analyzing it through tectonics as an open system, this article affirms that even seemingly irregular architectural forms possess strong internal logic in their structure, materiality, and design strategies.

Patchwork, often previously dismissed as design failure or emergency improvisation, instead holds potential as an alternative architectural strategy. It offers contextual, economical, and participatory approaches—particularly in addressing spatial challenges within dense, resource-constrained urban environments. Thus, patchwork architecture transcends reactive adaptation; it is a cultural expression demonstrating how communities actively and creatively shape their spaces.

RECOMMENDATIONS

1. ***For Designers and Developers***

It is time for designers/developers to acknowledge that architecture need not follow mainstream top-down approaches. In urban contexts, designers must relinquish some control and recognize users as primary actors in space-making. Extreme approaches like John Habraken's support-infill separation—where architects become process facilitators rather than absolute design authorities—grant occupants spatial sovereignty. They know best how their homes should evolve. The designer's responsibility thus shifts from dictating finished designs to enabling possibilities, facilitating change, and designing *for adaptability*.

2. ***Housing Policy***

Regulators should develop subsidized housing policies that anticipate modifications. Establishing guidelines for incremental growth and incentivizing structurally safe, code-compliant adaptations can prevent risky patchwork practices.

3. ***Architectural Education***

Curricula must broaden understanding of non-formal architectures. Patchwork practices should transition from fieldwork curiosities to legitimate design discourse and architectural theory—recognized as authentic cultural expressions of building.

4. ***Further Research***

Deeper studies are needed to formulate contextual *growing tectonics* guidelines, including:

- Structural integrity assessments
- Material modularity systems
- Socio-economic impacts of patchwork practices across diverse urban areas

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