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# Genealogy versus Genomics: The Architecture of the Future – A Case Study of Kampung Tanjung Gedong, Jakarta

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**Abstract** This study explores the phenomenon of the Genealogy of Modern Architecture theory as a Millennium architectural discourse, with its central issues on the analysis of iconic modern buildings from 1924 to the 2000s. While the concentration draws global attention towards the new approaches to dissecting the typology of modern interventions, the gap remains on the main agenda to advance genealogy, which includes serving deeper and larger undertakings. The problem lies in the stagnancy of focus on individual buildings and the query of networks' continuance, as the theory was not aimed at presenting origin and lineage, but the feature and signature of starchitects. The research aims to encourage a continuation of genealogy theory by presenting the genomic as an architectural builder, an organic system defined to mirror the genealogy theory. Methodology combines bibliography on typomorphology to present a comparison between genealogy and genomics while stimulating a new framework, allowing for extensive research into collective form, urban fabric, and the city. The steps are: 1) redefinition, 2) comparison, and 3) transformation in constructing genomic theory. Finding discovers a connection between genealogy and genomics to build a theoretical framework and to prompt collaboration between architects and planners to engage a deeper layer of typology and morphology of actual urban fabrics. Novelty is the genomic concept to encourage the utilization of surface and deep structures in typology for futuristic strategies.

**Keywords** Architecture, Genealogy, Genomic, Theory, Typology

## 1. Introduction

Initiated in the Millennium, architectural genealogy was conceptualized by Kenneth Frampton as a comparative framework for analyzing modern architectural masterpieces [1]. Employing theories related to typology, genealogy sought to explore the architectural features within composition. It was meant to comprehend the influence of the signature of the buildings as a powerful design formula. Though this theory has served as a significant source of inspiration for researchers aiming to understand cultural heritage in subsequent years, it was not aimed at targeting cultural origins or typological lineage at the beginning. This inquiry emphasizes a modern perspective for analysing individual buildings rather than presenting groups, and promotes a top-down methodology to depict and interpret formal expression rather than dialectical relationships. Even if it is generic and demonstrated in a linear fashion, it has aided in exhibiting a pattern of commonalities among models attributed to a specific personality [2]. In spite of its limitations, the research successfully ignites interest in the formula, mode, and design features, which have catered to more

engagement within the field of architectural genealogy. Later, this idea has evolved into a new autonomy in architectural study, facilitating deeper investigation into the origin of building typology, especially in relation to vernacularity, culture, genre, and styles [3]. Still, the genealogy was designed to target only the formal attribute of individuals but not yet cater to informal networks.

Even if more research targeted at interpreting the typological dominance for building lineage [1], genealogy has yet to delve into the more profound layers of architectural microstructures. This limitation arises because genealogy mainly concentrates on the surface structure of the building, a well-formed structure that shapes the abstract physical representation of the design [4]. Conventional typology is not designed to offer an in-depth analysis of mathematical geometry and systematical relationships within a larger ensemble of buildings; rather, it aims to elucidate the communalities and shared traits among individuals within a specific lineage [5]. In fact, the abstract representation inherent typology is frequently confined to a diagram or ideogram as a simplification of a language, highlighting the similarities and differences among structures, yet it fails to penetrate the core of architectural essence [6]. The existing gap pertains to a broader exploration of collective buildings and an understanding that transcends mere construction, encompassing urban fabric, collective form, and informalities as a cohesive group [7], alongside contemporary built forms that embody hybridity, foreign influence, and engineered objects that require profound comprehension toward deeper structures [8, 9]. Therefore, a new method of genetic architecture is required to investigate deeper architectural structures, and a novel theory is required to unfold existing volumetric urban fabrics that exist in our actual environment.

The concept of genomics within the field of architecture has surfaced in recent years, with terms such as DNA, genetics, and genes providing fresh insights into comprehending the intricacies of our constructed environments [10]. Various experiments have been conducted by researchers to explore different compositions and building configurations, assessing the extent to which architectural genetics can be articulated. Concurrently, designers are advocating for specialized terminology to more accurately depict intricate building elements, facilitating the creation of more complex assemblies [11, 12]. The label architectural genomics was once introduced by BlackBox Studio at Skidmore, Owings & Merrill LLP for a conference paper. The research was an experiment on parametric design for a skyscraper, utilizing geometry to govern the development of its structure [9]. Through a parametric application, the paper aims to present geometry as the most fundamental structure in architecture, despite the lack of a context and algorithm presentation during the process of transformation [13, 14]. Architectural genomics serves to connect and to emphasize the potential of architecture to regulate building articulation, although the paper remains constrained as merely an individual silhouette [15]. While it possesses genetic potential, the paper has not adequately explored the context or the pressing need to comprehend the broader, more extensive, and limitless sources of our built environment yet. Thus, in this paper, the fundamental framework of genomics is built to initiate a deeper investigation for its analysis.

# 2. Theoretical approach

### 2.1. Genealogy of Architecture

Architectural genealogy is defined as an architectural method built based on historical analysis for understanding architectural ideas, styles, and elements by investigating origins, influences, and transformations. It focuses on tracing the lineage of structures over individual genius, employing selection and categorization within typological methodologies by presenting formal characteristics inherent in architectural compositions [16]. The processes of simplification and narration are essential in storytelling [17], as demonstrated by architectural diagrams to comprehend the structural concept through interpretation, social context, and interactions. As a tool of illustration, genealogical diagrams often take the form of straight-up, single, monochromatic, and highly simplified illustrations that effectively highlight the fundamental structure of buildings, thus playing a crucial role in the development of architectural configurations [18, 19]. History is closely tied to the creation of family trees, establishing a singular, linear progression of the features that underscore the distinctiveness of a type [3]. Domination emerges as the *raison d'être*, with the physical characteristics serving as evidence of relationships, isolating a distinction as the sole argumentation in a *mise-en-scène* that traces a continuous lineage from its proto-architecture [16]. Single layout, simplified configuration, or axonometry are often displayed as detached from their context and surrounding environment to highlight features, attributes, and a compositional signature of individual buildings.

As it concentrates on searching individual relations and historical lineages, the genealogical theory proposes a typology that highlights the connections between individuals by distinguishing one from another based on structural similarities and differences [1]. Genealogy establishes an isolation in a selection process, grounded in functional, formal, and stylistic criteria, thereby constructing a hierarchical categorization system. This is a macro-scale procedure that relies on observable characteristics, a surface structure that serves as an abstract representation of a type to situate it within a broader or wider narrative of a historical context [3]. In this sense, genealogy aims to uncover a pluralistic and contradictory past that supports the linear logic of the type based on dominant silhouette, iconic features, and coherence elements. It highlights the co-relationship between

structure, elucidating formal similarities and divergences among paired building types. It reshapes the interpretation of modernism that aligns with architectural autonomy as irrefutable evidence and absolute verification of structural relationships through visual and physical representation [20]. This process fosters architectural identity, context, and periods through the notion of pedigree and kindship in architecture. It identifies a dominant surface structure that is persistent in a formal dialectic between classical and vernacular compositions [21]. Therefore, it lacks the ability to understand a greater scale of compositional buildings, unable to comprehend irregularities and anomalies in the environment, which is why a different formula is required to fill the gap by providing a method to dissect an organicity.

### 2.2. Genomic Architecture

The term genomic is inextricably linked to genealogy and genetics, serving as the overarching framework and the research umbrella. In fact, as an interdisciplinary field inspired by molecular biology, like building typology and morphology, genomics serves a specific agenda to cover the micro understanding of building structures [10]. Genomic architecture is defined as the examination of the genome; it outlines a three-dimensional configuration of genes and other regulatory elements within a cell, which serves as the smallest replicable unit in architecture [9]. Genomics encompasses specific, non-random organizational, functional, and regulatory domains that influence developmental processes, differentiation, and gene expression. The genetic material comprises applied information in the form of genetic codes made up of DNA sequences [16]. This field is an interdisciplinary field that concentrates on the study of the structure, function, evolution, and mapping of all the genes within an organism, rather than individual genes. Typologically related to structure, genomic architecture represents the most crucial aspect of its architectural organization that affects cellular processes [9]. It visualizes the evolution of three-dimensional structures, defined as its architecture [4], a nonlinear arrangement but a complex three-dimensional organization composed of geometric forms, which can be conceptualized as DNA and can be quantified, compacted, and extracted systematically, akin to an algorithm or tabulation [19]. Given that the genome is not static, it is subject to influences from context, interaction, and temporal factors, leading to variations across different cell types and conditions. Its functionality, robustness, and plasticity are maintained through interactions, relationships, and interventions, suggesting its potential for engineering in the pursuit of greater projects.

The genome is perceived as a collective framework, a population structure that organizes a spatial arrangement, and it serves as a determinant of cellular identity at a more granular level within the nuclear volume. Furthermore, it encompasses the entire collective characterization and quantification that interrelate and influence the totality of an organism [10]. It constitutes the bodily structure, including tissues that manifest the result of actions and reactions and convey a signature between cells to the function and structure of the entire complex system [19]. By concentrating on the relationship between the smallest unit and the whole system of a body, it holds the potential to connect the relationship between type as the smallest architectural unit to a totality, such as understanding the developmental process of a city [22]. Via typology and morphology, genomic architecture potentially bridges the dynamic relationships formed by the built environment, a compilation of collective architecture which is reflected in the underlying genetic condition that informs the overall concept of a city [15, 11]. It effectively detects anomalies, irregularities, and informalities as focal points while promoting diversity, plurality, and hybridity through the transcriptional-translational coupling mechanism [18, 6]. That is why a greater variety of structural variants can be produced to create, understand, and solve different molecular mechanisms within a built form, which exists as both an actual and an artificial environment [14, 19], so that it potentially unites the past and the present and hopefully creates a future based on the formal and informal architecture of our existing milieu.

### 2.3. The Architecture of the Future

Since the 20$^{th}$ century, the modern movement has been critically examining the operational dynamics of urban environments. Modernist architects and planners have realized that the segregation, separation, and isolation resulting from top-down planning and individual buildings have led to the development of fragmented and ineffective cities [23]. For instance, the Athens Charter in 1933 highlighted the city's planning principles that challenge the separation within the city, while notable *Congrès Internationaux d'Architecture Moderne* (CIAM), which took place from 1928 to 1959, has promoted the key concept of Functional City. Although the modernist movement initially fostered divergent perspectives among its members regarding the efficacy and constraints of modern planning, this dominant approach remains one of the most significant strategies in general urban development. In contrast, the Eastern polar movement, which emerged in Japan post-World War II, introduced an alternative point of view on architecture and led to the evolution of what is now referred to as New Urbanism. This approach perceives buildings and cities as organic, living entities that grow, transform, and decay over time, akin to biological organisms based on the Japanese Philosophy of Change [7, 8]. Accordingly, it projects a prediction of our future trends that is closer to sustainability goals.

Despite taking a different direction, this Philosophy of Change suggests a different idea of sustainability, which at that time was manifested mostly in organic-inspired

architecture. The concepts of organic growth, biomimicry, modularity, flexibility, megastructures, human-centric design, and ephemeral architecture represent variations of the contemporary vision for the future of organicism in architecture [5, 24]. At that time, the idea of the future was scrutinized through a more systematic lens, focusing on the imagination of the natural cycle: the integration with the ecosystem [25]. Among the proponents of metabolism architecture, Fumihiko Maki notably highlights a critical examination of isolated structures and advocates for the concept of linkage [8]. The notion of linkages is advised to transition from simple observation to the creation of strategic design tools for future applications. He proposed an acknowledgement of significant socio-cultural transformation in the urban tissue, the so-called collective form: the actual complex building agglomeration, infrastructures, and open spaces, as urban society is believed to be characterized by coexistence and conflict of diversity rather than generic individuals and standard organizations.

In this emerging paradigm of new urbanism, the idea of future architecture is predicated on the evolution of physical fabric and anticipated technologies. It shall aim to mitigate the effects of modernism, while honoring regional cultural identities, as well as specific environmental contexts, rather than relying solely on imaginative concepts [25]. The architecture of the future is expected to respect a dynamic rendering of the traditional conception of urban form that is found in ancient cities [22], while simultaneously resolving the problem of the present-day modern city. The reason is that a variety of interdependent factors operating within a rapidly developing environment are unpredictable, constituting a dynamic landscape of interrelated forces [26]. Despite the theory's lack of a coherent framework for architecture and urban design, this proposal displays the possibility of treating building structures as autonomous entities, employing a spatial language that effectively conveys architectural type in relation to urban morphology [27]. By specifically utilizing the idea of collective form, Maki posits that the structure of the built environment embodies the spatial and social logic of urban aggregation. It holds the promise of generating architectural innovation through the recreation of structure, form, and relationships within an integrated environmental system. However, it falls short in providing profound methodologies that transcend its historical precedents to embrace complexity, adaptability, and socio-spatial coherence in building the future, especially by using actual urban fabric and original settlement. Thus, in this context, architectural genetics endeavors to represent the fundamental materials for builders to regenerate sustainable visions of specific urban trajectories towards the future.

### 2.4. Kampung Tanjung Gedong as a Case Study

Kampung is defined as an Indonesian urban informality. Differentiated from a village that is located in the rural area, a kampung is commonly built as a group encampment, an urban settlement that is initiated from original inhabitation which may be formalized as it becomes an administrative division [27]. Kampung may be characterized as an organized camp for a specific community; it is a compilation of traditional houses, a collective form in the shape of a densely populated residential area, or neighborhood. It shows kampung spirit as a cultural concept that shows strong bonds and mutual aid, similarly displayed in traditional villages [16]. Despite being categorized as informal, kampung is the original settlement of Indonesian cities. It is growing organically and evolving together with history. Even if the house styles are varied, Kampung exhibits the heterogeneity of Indonesian culture as well as hybridity and everyday space reality [17]. Its semi-parametric aggregate is produced by spatial rhythm. Though, as a natural development built by its inhabitants has always been positioned as secondary, a separate entity, or alienated from its surrounding neighbourhood.

Kampung Tanjung Gedong is one of the well-known Jakarta informalities that grows together with its core. Located at the back of the Educational Zone in West Jakarta, this kampung is certainly older than its formal development located at its frontage, and has been supporting the development of various schools, universities, and other cities' facilities as accommodations and productions. Like most other global informalities, Kampung Tanjung Gedong is dominated by houses at its core, growing horizontally in an organic manner; its small grains aggregate displays a quasi-semi-parametric fabric in comparison with its surrounding masterplan complexes [5]. Uniquely constructed by the kampung community, it is a compilation of traditional houses inspired by the archipelago culture. Like other kampungs in Jakarta, this kampung displays various hybrid tectonic, details and materials that are specific to this context while maintaining integrity and synergy in the neighborhood [26]. That is why most of the research regarding Kampung still focuses on seeing the features of individual houses or seeing Kampung as a separate entity from its environment. The majority of architects and planners still perceive kampung as unplanned, illegal, and irregular aggregate and have not included kampung as part of planning and designing, though its existence and role are clearly fundamental to the city's development [10]. Genealogy in this sense is often used to investigate a kampung by focusing on the features of its individual houses to find its origin. It seldom investigates kampung as networks or urban fabric, where genomic architecture may offer a new concentration on its collective architecture, an inseparable chain of house collection. Kampung's organicity shall be regarded as a tissue of networks, a sample of urban fabrics of its city. By doing so, Kampung is no longer positioned as a compilation of individual houses, but as a city aggregate that holds a dominant urban scale of the area.

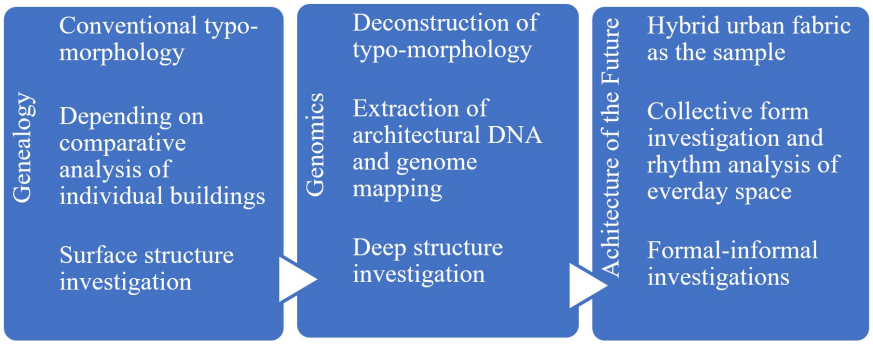


**Figure 1.** Schematic Diagram between Genealogy, Genomics and Architecture of the Future

Although the urban kampung in this research is taken as a case study to represent a collective architecture, the research sample shall not be limited to informal architecture; it could include the general urban fabric as a collection of buildings that collaborate together to support the neighbouring development. The case of kampung in this context is only taken as an extremely neglected sector that holds truly potential of a city, and it ironically represents the original, every day and naturally constructed by the local community, despite it appears traditional, vernacular, and may not be trendy, which is why it is often discredited in formal development. Kampung in this context is believed not only to have a role as the city core but also because the future may not always be represented by technological yet sophisticated objects or technology, but it can also be inspired by lessons, relations and experiences from the past, as shown by the research schematic diagram (Fig. 1).

## 3. Methodology

The methodology combines typo-morphology theory as a fundamental reference to present a critique of architecture and urban environment [19]. A comparative analysis of genealogy and genomics serves as a genetic research procedure. It is aimed at illuminating and underscoring architectural issues and problems within modern and post-modern perspectives, thereby establishing a basis for envisioning the future of architecture [28]. Historical and etymological steps are used to revisit and redefine the concept of genomic, using analogies that reflect building typology and morphology, while allowing for findings to be drawn from established projections [22]. Genealogy methods are deconstructed to produce a genomic architecture method using a Cartesian diagram as a tool to extract type, dimension, and module through rhythm analysis. Tabulation is utilized to convey the extraction of the arguments and reasoning [5]. It serves as a counterpoint to question the conventional typomorphology methods and to introduce genomic as a new theoretical concept, highlighting the originality of theoretical analysis-synthesis, which focuses generally on urban fabric but specifically on informality within this research.

## 4. Results and Discussions

In this contemporary era, top-down planning continues to prevail in architecture and urban design. While generic planning may contribute to standardization and internationalization, typomorphology aids in understanding historical and cultural connections. Most of the development is considered individualistic, typical, and Western-centric, which can lead to alienation, fragmentation, and segregation if not appropriately aligned with its context. This conventional planning also struggles to address present-day demands and situations that are dominated by hybridity in contemporary reality. As hybridity, along with the mixed complexity and ambiguity of post-modern architecture, relates to cultural diversification, variation, and mutation, concepts from genealogy and genomics can be instrumental in re-envisioning new urbanism, integrating macro- and micro-scale interventions, and fostering scientific advancements that are more aligned with future needs. Informality, for example, is one of the most challenging urban realities. Like other kampungs in Jakarta and other informalities in the world, this sector presents original, collective, daily, and everyday spaces that support the performance of a metropolis but have never been able to be accepted as equal to other formal development. Its existence has never been fully included as an essential element of the city. Including Kampung Tanjung Gedong, a core of West Jakarta informalities contributes to the development of Grogol Petamburan as the Educational area of the city (Fig. 2).

Most research on kampung fabrics often focuses on observation and conventional genealogy to understand the physical condition and origin of kampung (Fig. 3). Few present kampung features as the highlights to display uniqueness and characteristics, but have been ineffective in extracting its essence. Moreover, kampung research that focuses on individual buildings and superficial appearance fails to present the collectivity and organicity of kampung as often presenting its fabrics as single and unrelated rather than seeing it as a network or tissue in the environment, though presenting the overall surface structures.

**Figure 2.** Kampung Tanjung Gedong is one of the informal settlements in Jakarta and part of the Educational Urban Area of Grogol Petamburan, Jakarta Barat


**Figure 3.** Sample of Conventional Kampung Tanjung Gedong Mapping using traditional observation and Classic Typomorphology comparison in Genealogy for Investigating Origin

The focus has transitioned from the origin towards a novel comprehension of mechanisms, systems, and the proliferation of architecture as a collective entity of the city. The process of combination, recombination, and mutation within architecture is perceived as an urban phenomenon that yields increasingly hybrid environments. Across the globe, the post-civil societies consist of designers and community leaders who have explored whether deliberately crafted buildings, unconventional architectural forms, or even informal settlements have become increasingly prominent and even more relevant in contemporary contexts compared to common building typologies. This organic urban process of inheritance, transformation, and transmission occurs among diverse architectural forms. It necessitates not only a fresh perspective but, more importantly, an enhanced body of knowledge regarding production, theoretical advancement, as well as methodological innovation. It shall encapsulate the extensive historical narrative of typological and morphological comparative analysis as it has evolved through genealogy. While genealogy has significantly contributed to the understanding of conventional spatial realities through the tangible, visible, and surface structure in typological selection and categorization, there remains a deficiency in a micro system, as they remain obscured within the duality of their reflective structure. The context requires additional layers to be incorporated to grasp the intricate relationships within the built environment. In this proposal, a genomic method is proposed as a continuation of typo-morphology extraction based on actual networks. A deconstruction process is initiated to extract the essence of its architecture from a kampung collective. Volumes are dissected into planes, lines, and points using a Cartesian diagram. The networks are organized in a sequential manner to form a set of geometric and mathematical principles that dictate how a flat layer can be transformed into a three-dimensional deep structure (Fig. 4).

Mirrored image emerges as a representation of stagnation within genealogy, encompassing the unreal, the invisible, and the in-between. It embodies the idea that exists between the object and the abstraction that defines it, as well as the relationship that links the developmental figure. This reflection broadens the epistemological and experiential dimension of identity formation. By redirecting focus towards the articulation of the unseen, the dialectical contrast that transcends mere construction gains significance. In this context, the tabulation assisting planners and architects to investigate architecture is not to be perceived as individual, isolated, and absolute, but rather as co-dependent with its environment, forming a collective entity: the group form. One single building is now viewed as part of a larger collective form, an urban tissue with its system interconnected with the city's infrastructure. Its space should be understood not solely

through the self but also through the perspective of the others; it contributes a role in shaping the spatial and social subjectivity of the designer, the user, and the visitor. Genomic aspects, in this sense, provide a means of bridging gaps by emphasizing the unseen elements: the essence of architecture, including geometry, dimension, module, pattern, and algorithm, which together create a semi-parametric system that is integrated into the city itself. Although theoretically promising, the distinctiveness and identity of the genome remain ambiguous, which is why a tabulated approach is employed to present a comparison and contrast aiming to extract the core of each focus (Table 1).

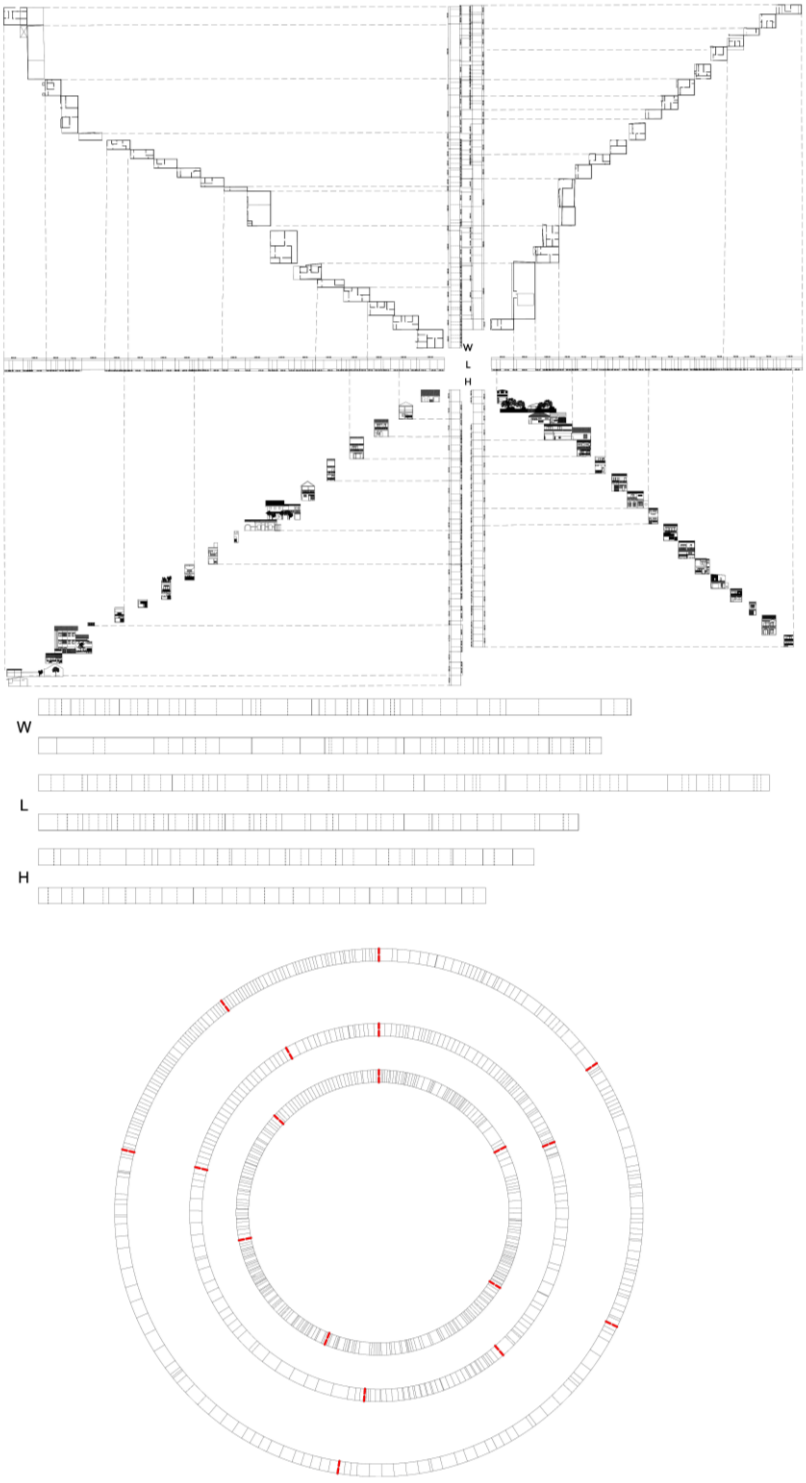


**Figure 4.** Initiation of Genomic Extraction of Kampung Tanjung Gedong to present DNA sequencing and Whole Genome Diagram for presenting Kampung Architectural DNA

**Table 1.** Comparative Analysis between Genealogy and Genomics

| | GENEALOGY | GENOMIC |
|---|---|---|
| **Aim** | • Origin<br>• Cultural<br>• Relationship | • Hybridity<br>• Originality<br>• Organicism |
| **Process** | • Interpersonal<br>• Lineage<br>• Selection<br>• Categorization<br>• Documentation | • Deracination<br>• Transmission<br>• Translation<br>• Reproduction<br>• Reformation |
| **Focus** | • Individual<br>• Typology<br>• Structural composition<br>• Configuration | • Collective<br>• Morphology<br>• Tissue<br>• Networks |
| **Product** | • Characterization of traits<br>• Genealogical trees<br>• Familial structural relationships | • Total genome<br>• Hereditary<br>• Transformation, Mutation |
| **Methods** | • Historical Analysis<br>• Oral traditions<br>• Genetic evidence<br>• Feature structures | • DNA sequencing<br>• Genetic Analysis<br>• Patterns of architectural inheritance<br>• Dominant & Recessive Genes |
| **Goal** | • Record of relationships<br>• Linkages among individual buildings within a familial or social group<br>• Feature and Signature | • Typological foundations<br>• Morphology formation<br>• Phenotypic traits of an organism<br>• Anomalies in evolutionary trajectories |
| **Diagram** | • Genealogical chart<br>• Lineage of a specific typological family.<br>• Identifying proto-architecture<br>• Delineating its interrelationships | • Comprehensive genome mapping<br>• Genes linked to specific conditions<br>• Genetic variations<br>• Rebuilding a new organism |
| **Procedure** | • Classification<br>• Cataloguing<br>• Codification | • Extraction<br>• Projection<br>• Simulation |
| **Sample** | • Family<br>• Class<br>• Kindship<br>• Pedigree | • Dominant type<br>• Recessive type<br>• Mutant<br>• Hybrid |
| **Product** | • Records<br>• Profiles<br>• Directories | • Real and Unreal<br>• Actual and Notional<br>• Present Day and The Future |
| **Beyond** | • Ancestry<br>• Forensic<br>• Identity | • Informal Cities<br>• Regenerative simulation<br>• Future projection |

Source: Authors, 2025

To envision the future of architecture grounded in the existing built environment, genomic approaches may redefine construction methodologies, structural-mechanical systems, and local-global principles, whether manifested in scale, proportion, or form. Finding shows genomics as a continuation of genealogy while presenting a contrast in the microstructure of genealogy. As a system, genomics suggests parametric organicism, employing a genetic analysis via DNA sequencing extracted from architectural patterns. An algorithm is utilized to govern structure, function, evolution, and even engineering manipulation of typomorphology. It projects and simulates

a three-dimensional geometry mapping in urban analysis as a tool rather than focusing on conventional typology comparison, like commonly used in previous genealogy. It extracts the essence of the built environment by employing deconstruction, thereby decoding the complete architectural DNA to reconstruct a dynamic, evolving system beyond static typological improvements. As a methodological approach, it potentially offers a conceptual framework of geometric forms that is capable of being multiplied sequentially, in accordance with a mathematical formula, to recompose collective forms. In doing so, this collective form serves as a regenerative agent built based on rhythm analysis, reflecting a synthesis of everyday human context. If applied directly to its context, this algorithmic representation of spatial rhythm could evolve into a complex multiscale system that transforms the future of our built environment.

## 5. Conclusions

Genomic architecture represents both a continuation and an extension of the architectural genealogy. It fills the research gap in genealogy by presenting a typomorphology guideline that focuses on microstructure: the deep structures, and moving on from typological comparison between individual buildings common in classic genealogy to diving into geometrical algorithm patterns extracted from actual urban fabrics. It provides a theoretical framework for extracting, comprehending, and reconstructing the collective genome and DNA of built forms. This approach employs a bottom-up strategy as a contribution for architects and planners to utilize microstructures extracted from the actual built environment to foster localized, contextualized, and specific aggregates aimed at constructing future collective form, shifting the conventional focus of top-down planning that often uses generic typology.

This investigation proposes extending the theory through an antithesis directed towards genealogy. It facilitates comparison and contrast that complement and reinforce their interrelationships. Despite its complexity, genomic architecture is most effective to be used to understand informality, irregularities, and organicity; it is more productive to highlight differences, variations, and hybridity, and may not be efficacious for investigating uniformity, formality, and monotonous objects and must be further advanced for genealogical purposes, such as forensic architecture or bioengineering. Further methodological exploration is essential to develop a genomic architecture that offers greater novelty as a design tool, given that algorithms, patterns, and rhythms necessitate a systematic approach of extraction, interpretation, reproduction, and simulation in future projections. This theory serves as an impetus for practitioners. Advanced tools for analysing a hybridized spatial condition and identifying anomalies in our present-day environment are a crucial parameter for the creation of future regenerative genomic architecture.

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