

# Spatial changes in Royal Malay Town: The Inheritance of 'Kota' for Sustainability of Urban Conservation Practices

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**Abstract.** The continuous degradation of historical urban fabric in traditional towns has hindered efforts to implement sustainable urban conservation practices. Considering the dynamic and complexities of urban areas, which encompass multiple relationships to geographical settings, functional economic and socio-cultural factors, understanding the contextual formation and growth therefore becomes an important consideration in any development project. However, analysing the evolutionary process requires systematic structuring at each hierarchical scale, temporal dimension and level of morphological elements. Thus, posing a significant challenge in extracting the organic growth development of traditional towns. This study attempts to develop a methodological framework for integrated urban morphological analysis that guides the analytical process of spatial changes in Royal Malay town. A case study at Old Town Centre of Kota Bharu, Kelantan was conducted with an emphasis on structuring the case and plan-unit analysis based on diachronic and synchronic comparisons. The findings unveiled the inherent morphogenetic characteristics of Royal Malay towns central to the spatial structure of Kota, which demarcate the fixation line of the growth process and imperative to the functioning system for spatial resilience. This implies that developing a systematic methodological and mapping analysis process aids in providing a clear and responsive strategy in managing rapid spatial transition. This study brings forward the bridging of multidisciplinary knowledge on urban history, geography, design, planning and management to assist in the formulation of comprehensive development guidelines and policies that emphasize an explicit morphological perspective.

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## 1 Introduction

Spurred by growing concerns regarding the gentrification of historical urban areas, which threatens to erode the distinctive urban fabric of Malay towns, there has been a surge of research aimed at identifying the unique characteristics of Royal Malay towns. This research seeks to apprehend the value of Malay urbanism, which is closely related to urban morphological research. While existing research deeply explores heritage and socio-cultural aspects, the exploratory methods for conducting urban morphological analysis particularly those based on the application of relevant concepts and approaches remain underutilized and require contextual adaptation to the unique growth and expansion patterns of Malay towns. Consequently, there is ambiguity in the development of systematic mapping analyses that comprehensively measure the spatial changes occurring over time [1-3].

This ambiguity, especially in explaining the analysis process based on the relationship between urban form and its complex morphogenesis, has led to confusion regarding how the spatial structure of Royal Malay towns can be analyzed systematically. Analyzing the evolutionary processes of urban areas requires a systematic approach that considers hierarchical scales, temporal dimensions, and morphological elements. The complexity of these processes makes it challenging to extract the organic growth patterns of traditional towns, including the Royal Malay towns [4]. Further complicating the situation is the limited understanding of the formation, growth, and transformation processes of Royal Malay towns to be depicted within the context of Malay urbanism, henceforth hampers efforts toward effective urban conservation practices. This shortcoming has become increasingly apparent and must be addressed, particularly when considering viable adaptations to rapid urbanization, which threatens the survival of historical cities and thus ensuring the spatial resilience of Royal Malay towns.

Therefore, there is an urgent need to develop a clear understanding on the processes of spatial change in historical towns in relations to the methodological approach of urban morphological analysis within the broader context of Malay urbanism. This study aims to develop a methodological framework for integrated urban morphological analysis to guide the analytical process of spatial changes in Royal Malay towns. Focusing on the Old Town Centre of Kota Bharu, Kelantan, as the study area, this research seeks to unveil the inherent morphogenetic characteristics central to the spatial structure of kota, which represents the urbanism of Royal Malay towns.

## 2 Urban Morphology and Conservation

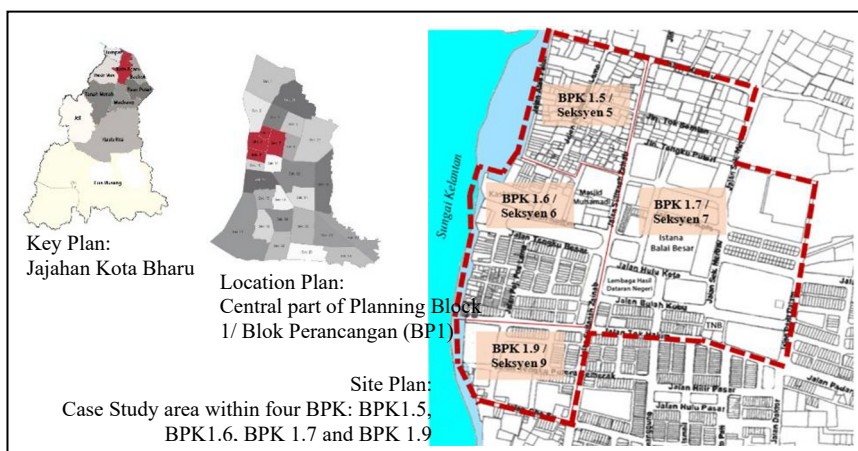
The theories and practices of urban morphology as a scientific study of physical urban form have been widely discussed, offering diverse perspectives on applying these approaches across multidisciplinary knowledge domains. The theoretical aspects of urban morphology are closely related to urban geography, history, architecture, and economics, while its applied forms are integral to urban design and, simultaneously, a vital component of urban planning. Despite its relevance to urban contexts, the approach of urban morphology remains unrecognized, poorly understood, and seldom applied in the management of historic towns and cities [5]. Subsequently, although urban morphological research has been closely linked to urban conservation since its early development, its substantial grounding based on strong theoretical basis and methodological framework has not been adequately explored. The lack of a comprehensive morphological framework that clearly highlights the methodological process has resulted in a weak foundation for facilitating urban conservation practices, thereby hindering efforts to formulate responsive strategies and guidelines for urban renewal.

Urban morphology primarily developed from two schools of thought: the historical-geographical approach of Conzenian and the process-typology approach of Muratorian. These approaches focus on analyzing the formation and transformation of urban fabric as analytical components and the relationships between these components, which are described according to spatial compositions and configurations over time. Although both approaches share a common focus on urban form as the subject of analysis, their purposes diverge significantly in application [6]. This research investigates the integration of urban morphological approaches and their application in urban conservation practice by using the three basic principles of urban morphology; namely the hierarchical scales as resolution, morphological element, and temporal dimensions of time. These three aspects are embedded in structuring the methodological framework for integrated urban morphological analysis.

### 3 Methodology

#### 3.1 Study Area

A case study is conducted in the Old Town Centre of Kota Bharu, Kelantan. As the capital city of Kelantan, Kota Bharu was formally established in 1845 with the construction of the royal palace, Istana Balai Besar, and has since been recognized as one of the nine prominent Royal Towns in Malaysia [7]. Based on the administrative and operational boundaries, this area lies within Planning Block 1 (BP1), the central part of Kota Bharu. Further divided into Small Planning Blocks, or Blok Perancangan Kecil (BPK), the concentrated study area encompasses four BPKs: BPK1.5, BPK1.6, BPK1.7, and BPK1.19. These areas cover a total land area of 65.90 hectares and contain a mix of commercial, residential, and administrative uses. Due to its rich historical and cultural heritage, the area has been designated as the Cultural and Historical Zone of Kota Bharu and it has retained its spatial organization as an administrative center for nearly 180 years. Consequently, this study area provides a significant site for tracing the evolution of spatial changes, in accordance with the purpose of this research to serve as a representative or instrumental case. Apart from meeting the conforming criteria of the site based on two main determinants, notably the physical and site conditions, the area was selected as a prototype case representing the morphology of a Royal Malay town. Figure 1 delineates the case study area.



**Fig. 1.** Location of study area at Old Town Centre of Kota Bharu, Kelantan.

### 3.2 Data Collection

The study employed two data collection techniques central to qualitative case study research that are document analysis and observation. Through document analysis, data were primarily collected from archival documents and records to understand the historical background of the site, the developmental changes that occurred over time, and the spatial organization of morphological elements within the study area. The archival documents gathered can be categorized into five types: historical written texts, historical maps, early travel records, photographs, and official records. These data types are flexible and context-specific, hence suitable for adoption in the interpretation process of the town's historical evolution according to the interpretative-historical design framework. Table 1 lists the samples of archival data used in the document analysis.

**Table 1.** Sample selection of archival records used in document analysis.

Types	Document Title	Resource
Written historical source (books, journals, monograph)	1. Detik2 Sejarah Kelantan (1971) 2. Kelantan dari Zaman ke Zaman (1970) 3. Monograf Warisan Kelantan 4. Journal of the Malayan Branch of the Royal Asiatic Society (JMBRAS)	Written sources depicting the historical, economic, political and sociological background of Kelantan
Early travel records	1. Kisah Pelayaran Abdullah Munshi (1838) / Kisah pelayaran Abdullah ke Kelantan 2. Kelantan: A Handbook of the Malay Peninsula (1907) 3. History of Kelantan (1934) 4. The Civil War in Kelantan in 1839 (1965) 5. Peoples and Politics of the Far East (1894)	Observation and experience in Malaya during the early 19th century were documented through a travelogue and publishing books
Historical Maps / Plan	1. Schematic map of Kota Bharu in 1910 2. Town Plan of Kota Bharu in 1969, 1981, 2004 and 2010	Archival exploration on historical maps
Early photographs	Early photo of Kota Bharu in document and desktop study since early 19 <sup>th</sup> century	Archival exploration on early photograph

In addition to extensively relying on archival records, this study triangulates data collection with observation to gain direct data by visually examining the details and occurrences within urban spaces. This detailed examination encompasses both physical and social aspects. Observing physical aspects involves analyzing the diversity of morphological elements that constitute the composition and organization of urban spaces by examining the layout of physical components which remain intact in the Old Town Centre of Kota Bharu, Kelantan. The importance of examining the overall layout, which shapes the uniqueness of the urban fabric such as building types [8] and street arrangements [9] is critical in revealing the spatial features and character of spaces in the study area. For social aspects, observing the behavior and interactions of residents within urban spaces enhances the understanding of how socio-cultural activities influence the use and function of these spaces [10]. The process of observation fosters intersubjective knowledge through activities such as taking photographs and field notes, providing insights into the current situation and initial perceptions of urban development processes and spatial changes occurring in the study area. Figure 2 illustrates the examination of both physical and social aspects through visual observation in the study area.

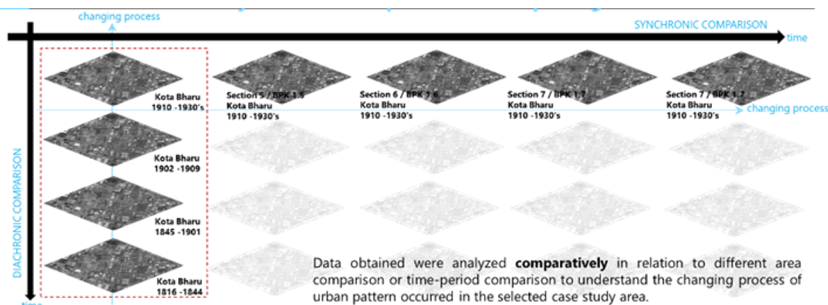


**Fig. 2.** Observation of the physical aspects to evaluate the diversity of morphological elements that constitute the organization of urban spaces at Old Town Centre of Kota Bharu, Kelantan.

### 3.3 Mapping Analysis

The study employed mapping analysis as a method for examining the complexity of urban spaces at different levels or scales [11] and for analyzing the transitional elements to understand the dynamics of morphological evolution [12]. It encompasses the use of maps and web-based urban analysis techniques, which are widely applied across various fields of urban studies [13]. The significant reliance on mapping analysis as a crucial analytical approach has been evident since the early physiognomic era of urban form studies by extensively use of town plans and cartography to classify city types, trace evidence of original settlements, and understand the morphogenetic processes of urban forms [14-15]. This approach has significantly shaped the morphogenetic tradition, highlighting the intricate relationship between historical urban growth and spatial configuration [16-17].

The process of mapping analysis was conducted at three levels as follows: (i) structuring the case and plan-unit analysis; (ii) mapping the morphological elements according to spatial and temporal dimensions; and (iii) evaluating spatial changes based on diachronic and synchronic comparisons. Structuring involves scrutinizing the systematic case study design based on an interpretative-historical framework, thus addressing the issues of validity and reliability in the single-case design [18]. Moreover, assists in the longitudinal exploration of mapping morphological elements across spatial and temporal dimensions through three phases: the formation, growth, and changes that occurred in the Old Town Centre of Kota Bharu. This evolutionary process is examined simultaneously from diachronic and synchronic comparisons [19]. This multi-level approach provides a comprehensive understanding of the morphogenesis process and reveals the distinctive morphogenetic characteristics of the Royal Malay town. Figure 3 illustrates the framework of the mapping analysis implemented.

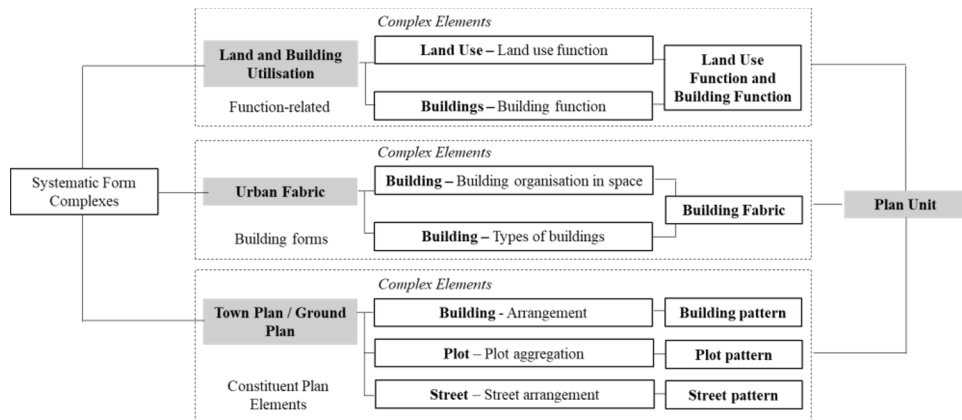


**Fig. 3.** Observation of the physical aspects to evaluate the diversity of morphological elements that constitute the organization of urban spaces at Old Town Centre of Kota Bharu, Kelantan.

## 4 Findings and Discussion

### 4.1 Methodological Framework for Integrating the Urban Morphological Approaches

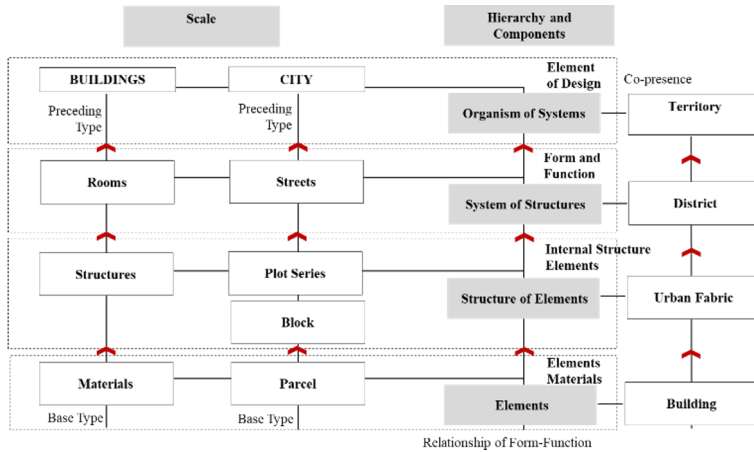
The methodological approach to conducting urban morphological analysis is structured around the constituent elements of urban form complexes in town-plan analysis, which can be categorized into a tripartite division of urban form. Derived from the historical-geographical approach of the Conzenian tradition, this categorization encompasses three levels: (i) ground plan, (ii) urban fabric, and (iii) land utilization patterns. At the first level, the ground plan includes constituent elements such as sites, streets, and their connections within the street network system, as well as their relationships with building block elements. At the second level, the urban fabric focuses on the three-dimensional elements of buildings, including building types and the spatial distribution patterns of building placement. Lastly, at the third level, land and building utilization examines the interrelationships between functions [20]. Taking all identified levels into consideration, the structuring of urban plans can be summarized with respect to three complex form elements: (i) streets and their arrangement within the street network system, (ii) plots and their aggregation, forming relationships between blocks and streets, and (iii) building block plans that illustrate the layout of building plots. Figure 4 outlines the methodological framework for analyzing spatial changes according to the historical-geographical approach.



**Fig. 4.** Structuring the methodological framework of urban morphological analysis according to tripartite division of urban form complexes and its relationship to plan-unit based on historical-geographical approach.

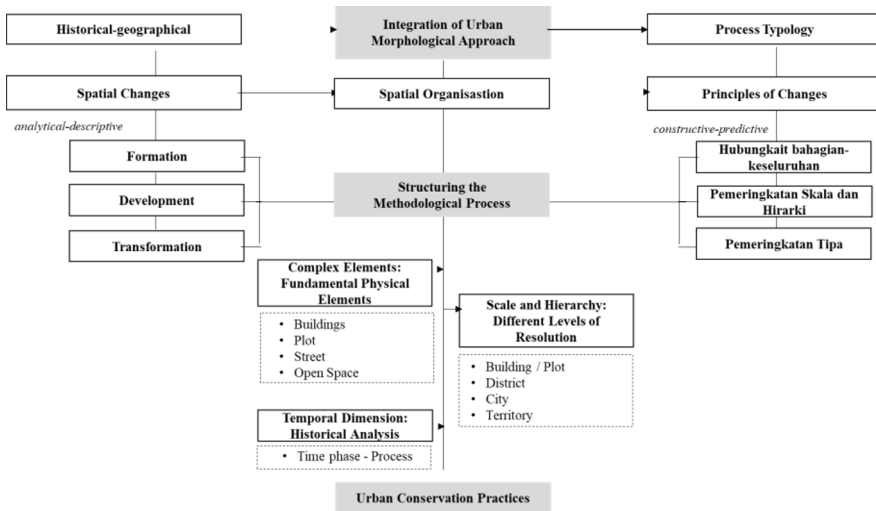
Working with the key concept of urban form complexes, the study integrates the approach of typological analysis from the Muratorian tradition to understand the hierarchical scale central to process typology. The dialectic relationship between form and structure, represented as formal unity, is closely linked to temporal phases in the process of modifying structural forms. This relationship is observed by distinguishing between the concepts of spatial and temporal relationships, referred to as co-presence and derivation [21]. These concepts serve as the basis for general evaluation, particularly in extracting the organic growth and development characteristic of Royal Malay towns. The analysis of co-presence is the result of observing abstract relationships between components within the sub-sections of a form, which can be arranged to form a structure consisting of four hierarchies: (i)

elements, (ii) elements of structures, (iii) structural systems, and (iv) structural organisms. This structuring can then be analyzed on two main scales: the building scale and the urban/city scale. Within these two scales, various levels of analysis of physical elements can form a series of spatial configurations. Figure 5 outlines the methodological framework for analyzing spatial changes according to the typological process approach.



**Fig. 5.** Structuring the methodological framework of urban morphological analysis according hierarchical scales and its relationship to spatial-temporal dimension based on typological process approach.

The integration of analytical approaches combines conceptual methods from historical geography, which are analytical-descriptive, with an emphasis on interpreting the processes of formation, growth, and change of urban forms based on historical development. Meanwhile, the typological process approach, which is constructive-predictive, is employed to understand the underlying principles governing changes in urban form at various scales and hierarchies. The insights gained from this integrated framework can be applied in practical urban design and conservation practices. Figure 6 delineates the integration of the historical-geographical approach and typological process to provide a systematic methodological framework for analyzing changes in spatial patterns central to urban morphological analysis.



**Fig. 6.** Methodological framework of integrating the urban morphological approaches for systematic evaluation of spatial changes to aid in sustainable urban conservation practices.

### 4.2 Morphogenetic Characteristics: Spatial Form and Structure of ‘Kota’ for Conservation of Royal Malay Town

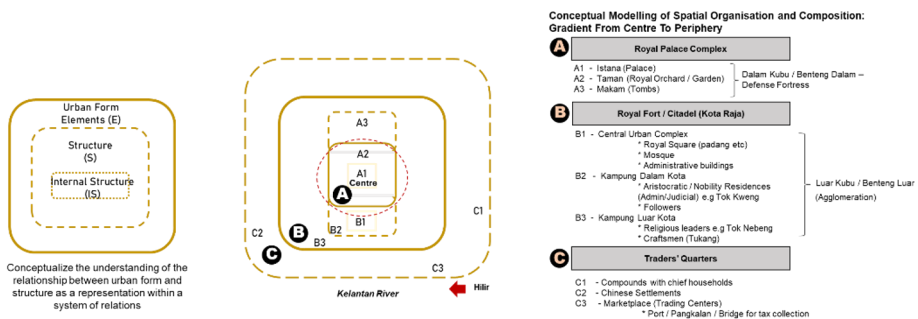
The methodological framework outlined in Fig. 6 was implemented to evaluate the spatial changes that occurred in the Old Town Centre of Kota Bharu, Kelantan. The findings reveal that the spatial formation of the Royal Malay Town can be understood through the concept of ‘kota.’ In the context of Malay urbanism, ‘kota’ represents a city or town, often functioning as the administrative capital of Malay Sultanates and also serving as a fort. The spatial planning and layout of Kota Bharu were centered on the principles of constructing the royal palace complex, or *Istana*, which signifies the establishment of the kingdom or ‘*Kerajaan*’ and its capital. The construction of the *Istana*, complete with a defense system of *kubu* or *benteng*, stimulated the growth of village settlements that radiated from the geographical location of the *Istana*. Through agglomeration, these settlements depicted the urbanism of the area, characterized by bustling economic activities, a nearby water transportation system, religious centers, and administrative buildings overseen by the nobility and later by Siamese and British officers. The morphogenesis process began with the synoecism of villages or *kampung*, which served as an archetype for urban development. Figure 7 depicts the morphogenesis process of Kota Bharu throughout its formation, growth, and changes, illustrating the geographical location and urban components that represent its morphological characteristics.

Kota Kubang Labu (1701-1776)	Kota Galuh (1777-1815)	Kota Mengseta (1816-1844)	Kota Bharu (1845)	Construction of Kota (Depicting town/city)
1. Kg. Dalam Kota (Dalam Kota Kubang Labu)	1. Kg. Galuh (Kg. Che Bu) 2. Kg. Garong	1. Kg. Kota Sultan 2. Kg. Raja Bendahara	1. Kg. Kota Sultan 2. Kg. Raja Bendahara 3. Kg. Masjid	<b>Agglomeration</b>
1. Benteng Luar 2. Benteng Dalam	1. Dalam Kota 2. Luar Kota	1. Dalam Kota 2. Luar Kota	1. Dalam Kubu 2. Luar Kubu	<b>Spatial Structure</b>
1. Palace (Istana Kota Kubang Labu) 2. Aristocrat residence	1. Palace (Istana Galuh) 2. Aristocrat residence 3. Administrative buildings 4. Port of Pengkalan Galuh 5. Market and commercial area	1. Palace (Istana Mengseta) 2. Aristocrat residence 3. Administrative buildings 4. Mosque 5. Port of Pengkalan Tambang 6. Market and commercial area 7. Open space of Kebun Mengseta 8. Residence for Siamese Officer	1. Palace (Istana Balai Besar) 2. Aristocrat residence 3. Administrative buildings 4. Mosque of Masjid Tua 5. Port of Pengkalan DiRaja 6. Market and commercial area 7. Open space of Padang Kalumpang 8. Residence for Siamese and British Officer	<b>Urban Components</b>

**Fig. 7.** Morphogenesis process throughout the formation, growth and changes in terms of geographical location central to the establishment of ‘Kota’ depicting ‘Kerajaan’ as well as towns or city in cosmological concept of Malay urbanism.

The findings of this study also conceptualize the understanding of the relationship between urban form and structure as a representation within a system of relations and based on the concept of aggregation that forms the sub-division schema between structure and form in the typological process. The relationship between structure and form is interconnected to form specific patterns, reflecting the overall morphological characteristics. The conceptualization of the relationship includes elements (E), structure (S), internal structure (IS), and structural relationships. Urban form elements (E) are the basic components that form the internal structure within the system of urban form, which consist of the main physical elements, namely the morphological elements of streets, plots, and buildings. These elements create interconnections and illustrate how they are organized and interact within the system of urban form. The organization and interaction between these elements are structurally related to functions, forming a system of structures that subsequently shape the overall urban form.

In Old Town Centre of Kota Bharu, the interrelation of all these elements between structure-form revealed from the understanding of the spatial organisation of Kota which unveiled the inherent morphogenetic characteristics of Royal Malay towns. The decomposition of the internal structure system of urban form into sub-systems of urban form elements allows for the hierarchical arrangement of sub-systems, forming distinct hierarchies and typologies of urban form reflected in the organisation of Kota Luar and Kota Dalam. The diversity of urban form elements and their aggregation into sub-systems reflect the interpretation of the distinctive urban form exists at different hierarchical levels. The findings also revealed the understanding of the system of urban form can be visualised from spatial organization and the interactions occurred along the gradients to periphery. The central area of Royal Palace Complex influenced the demarcation of Kota Dalam and still hold a governing rule to the function of activities surrounding Kota Luar. Figure 8 depicts the understanding of urban structure as an organized spatial organisation and composition based on the contextual depiction of the study area at Old Town Centre of Kota Bharu, Kelantan.



**Fig. 8.** Understanding of urban form and structure as an organized spatial organisation and composition based on the contextual depiction of the study area at Old Town Centre of Kota Bharu, Kelantan forming a representation within a system of relations

## 5 Conclusion

This study presents a methodological framework for integrated urban morphological analysis, with a focus on the spatial changes in Royal Malay towns. The case study of the Old Town Centre of Kota Bharu, Kelantan, demonstrates the applicability of this framework in unveiling the inherent morphogenetic characteristics central to Kota which demarcate the fixation line of the growth process and imperative to the functioning system for spatial resilience. The findings underscore the importance of developing systematic analysis processes and bridging multidisciplinary knowledge to support sustainable urban conservation practices.

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