

Urban Form Elements and Urban Potentiality | Literature Review

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ABSTRACT

Morphological theories shape the leading platform to theoretically and practically consider the assets connected with the emergence of the city, and its growth and development over time. In this paper, five elements of the urban form are typified: structure/tissue, plot, building, block, and the street pattern will be addressed. Understanding the urban form at the different levels within its ingredients could lead to shape a base launch of how to consider the potentiality of the development and sustainability a particular area.

Keywords: Urban elements, Urban potentiality

عناصر الشكل الحضري والإمكانية الحضرية مراجعة بحثية

حيدر جاسم عيسى الساعدي

مدرس

قسم هندسة العمارة / الجامعة التكنولوجية

الخلاصة

تشكل نظريات المورفولوجيا الحضرية قاعدة معلوماتية رائدة للبحث والدراسة ليس فقط من الناحية النظرية والعملية في الأصول المرتبطة بظهور المدينة ونموها وتطورها عبر تاريخها سواء القديم منه أو الحديث والمعاصر بل كيفية إستدامة المدينة نفسها. في هذه الورقة - وهي مراجعة للأدبيات السابقة ذات العلاقة - يتم تسليط الضوء على خمسة عناصر من البنية الحضرية: الهيكل / النسيج الحضري ، قطعة الأرض ، المبنى ، الكتلة ، ونمط الشارع. أن فهم البنية الحضرية على مختلف المستويات ضمن مكوناتها من شأنه أن يؤدي إلى بلورة مرتكز أساسي لكيفية النظر في إمكانات التنمية والاستدامة في منطقة معينة. الكلمات الرئيسية: العناصر الحضرية، الإمكانية الحضرية.

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1. INTRODUCTION

There is an increasing awareness of the morphological principles of the city form and the types of processes and methods that are adopted, not only as physical entities, but also as inherent powers. All these dimensions have become a significant factor in managing both the city's urban form and the people who benefit from the city at different levels. Tracking the assets of a city to understand the nature of the built environment has led to several types of approaches and seen the development of three leading schools of urban morphology, namely the British, Italian, and French. This development also aims to understand the mutations that have taken place during the modern movement and their effect on the old parts of cities including the subsequent of the changes to its social life and human interactions with the new environment.

The study of the urban morphology aims to create a platform to comprehend the central transformations that occurred in the city over time including its street and social life. The morphology of the city can be addressed in two dimensions: vertically, when the old part of the city is subjected to a new era of comprehensive urban development plans, and horizontally, when where new neighbourhoods are located beyond the old boundary of the traditional part of the city. The hierarchy defines the scope of morphological studies; furthermore, addressing the urban form at different scales of a city is a critical point in determining the range of this current research, which lies within a considerable selected boundary but is embedded within the four types of urban morphology.

2. URBAN FORM ELEMENTS

Urban structure refers to the diversity in patterns and spatial distributions in a city. It can be "equated with the two-dimensional organisation of the ground plan of an urban area, such as the street pattern or the structure of land parcels" (Marshall, 2005b, p 14-15). A settlement form tends to be more specific than an urban form as it embodies the form of separate settlement units, for instance, cities and towns. In comparison, the urban form can be understood as a portion of urbanities, such as constituent parts or other urban growth. A development pattern is "an urban area in deliberate formations – as opposed to emergent accretions. In other words, a development pattern is one that is consciously conceived" (Marshall, 2005b, p 14-15). The built form "typically implies [the] urban form in three dimensions, at the scale of individual buildings. Like development pattern, [the] built form has the connotation of the representation or construction of a preconceived artefact rather than an emergent accretion of independently assembled parts" (Marshall, 2005b, p 14-15). Urban fabric, "has the connotation of being a continuous surface, often a pre-existing form that may be 'torn' by new interventions, or 'repaired'. It is suggested that the urban fabric has a fractal dimension lying between two and three. Like a garment fabric, it is composed of surfaces, with a variety of tucks and folds, laying out a configuration of adjacency and accessibility, without necessarily including the solid three-dimensional material of which it is made" (Marshall, 2005b, p 14-15).

2.1 Structure | Tissue

The morphological aspect of cities is experienced as an entity, which is formed by various elements that emerge synchronically and diachronically. However, these elements have two types of relationship; the first is the relationship between their parts that give the final form to the object, while the second is the rules that govern the relationship between these elements and that draws the entire picture of the city. Moreover, these elements and their parts are organised in a hierarchical way, regarding their function, shape or position. Conzen calls this the 'plan unit'

whereas Italians use the term *tessuto*. Plan units, or tissues, are groups of buildings, spaces, plots and streets (Fig 1) (Moudon, 1997).

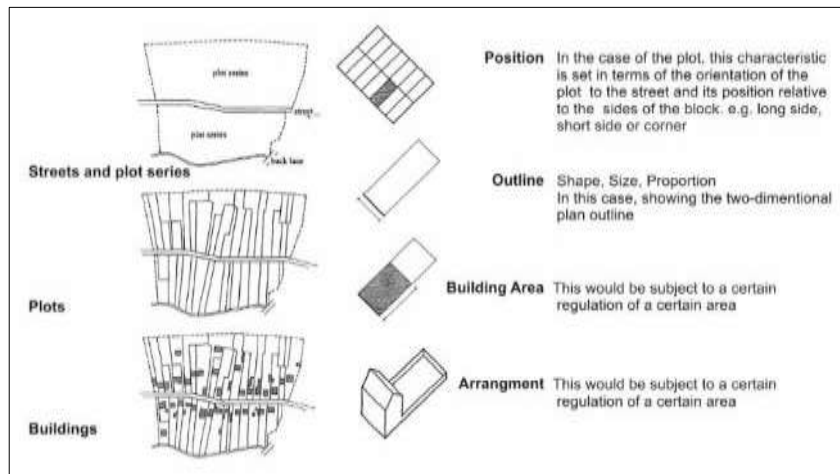


Figure 1. The elements of urban tissue according to Kropf's views. Source: Kropf (1996a, p 727, 728, 731).

(Kropf (1996b) defines the urban tissue as hierarchical and organic with different levels that primarily synthesize all components. These various levels correspond to the different primary elements, where a higher-level resolution presents more detail, including the building materials. However, streets and blocks signify what Kropf calls the low level. From this perspective, a city could be experienced as an arrangement of streets and blocks within a general level that might be used to recognize cities by considering the relationship between mass and space. Due to its increasing specificity, the volume of the description will be profound as it includes the components of plots, plots series, building structure and materials (Kropf, 1996b). The hierarchy classification could start from the smallest unit of the urban tissue and then zoom in to involve the entire tissue of the city. From a typomorphological perspective, (Kropf (1996a, p 724) addresses the urban tissue components and their relationship to each other by suggesting that “typomorphological analysis systematically distinguishes these different elements and element patterns in the fabric of a town and brings them together in the concept of urban tissue ... [and] the notion of urban tissue is a fundamental element in typomorphological studies. It is also the key to realizing the principles of typomorphology within a system of form-based zoning. As a tool in analysis and explanation, it helps us to understand both the physical structure and historical development of urban areas and the relation between urban areas and individual buildings”.

However, Kropf adopted six elements based on Conzen's and Caniggia's conceptions, which are: (a) streets and blocks (or plot series), (b) plots, (c) buildings, (d) rooms or spaces, (e) structures, such as walls or roofs (encompassing the details of construction) and, (f) materials (Kropf (1996a, p 725-726) (Fig 1). Moreover, (Kropf ,1996a, p 726) emphasizes the outline of elements as a primary definition; “the outline of an element is specified by describing its external boundaries in terms of its shape, size and proportions.” In some instances, either for convenience or because of a lack of information, this is limited to the plan outline, namely the two-dimensional outline on the ground plan. The arrangement is described in terms of the type of component parts, the number



of parts and their relative positions. In turn, the component parts are distinguished by their outline (**Kropf, 1996a**) (**Fig 1**). Thus, (**Kropf ,1996b, p 262**) concludes that, “urban tissue can aid in the task of identifying and describing the character of towns. Tissue offers a clear and explicit means of specifying the physical characteristics of towns that together provide, in turn, a framework for a more rigorous account of character.” Regardless of their location and historical emergence, cities share the same urban tissue components; plots-buildings, block-street, neighbourhoods-quarter, and so on. Thus, each city is characterized by how these components are arranged in order to shape the specific identity of the city, which distinguishes it from other cities (**Fig 2**). This differentiation according to its urban structure (which includes different spatial configuration patterns) enables people to recognize it.



Figure 2. Urban tissues of eight different cities, at approximately the same scale: Brasilia, Djenna, Venice, New York, Barcelona, Paris, Rome and Sana’a. Source: (**Oliveira ,2016, p 9**).



In their practical understanding, **(Porta et al. , 2014)** state that urban tissue could be the starting point in dealing with urban morphology. This can be achieved by understanding the crucial relationships between street networks, plots, and, blocks where these components could be invested to promote and develop an adaptable urban tissue **(Porta et al., 2014)**. In addition, **(Kropf ,1996a, p 723)** alludes that, “there are other, larger-scale objects which we identify when describing towns, most obviously entire buildings but also plots, blocks and streets. Similarly, there are patterns of these objects, all of which contribute to the character of a town. Differences in street and block patterns, plot patterns as well as in arrangements of buildings within plots and shapes of buildings can create very different environments”.

2.2 Plot

A plot might be the smallest unit within the urban forms, and this plays a crucial role in shaping the street edge and dominates the main realms: public, semi-public, semi-private, and private. Because the primary focus is on the building that occupies the plot rather than the plot itself, the plot is entirely neglected by urbanists and developers **(Oliveira, 2016)**. According to **(Oliveira (2016, p 23)**, “the definition of the plots system in a given territory is an essential element of its urbanisation process and has considerable stability over time. The decision on what would be the new structure of private ownership in a territory might involve the subdivision of a set of large plots”. Moreover, **(Oliveira , 2016)** states that the plot’s characteristics could govern the relationship to the street in terms of the distance between the adjacent edge of a plot and the street, the location of the plot within the plot pattern (block) and the geometrical dimensions of the plot. The plot boundary that constitutes the street edge has a significant long-term influence and tends to survive relatively unchanged. For this reason, plots mainly have an impact on the future form and the historical processes of a city. The plot, however, can be understood from the micro-morphological perspective; therefore, the need for analytical studies of the plot at this scale of a morphological investigation might be required **(Whitehand, 2001)**.

Morphologically, **(Thwaites et al. ,2013)** proved a new perspective, namely the transitional edge in relation to the plot rather than the block. This helps, “to examine more clearly the social relevance of the relationship of plot to the streetscape and how this can support a wide diversity of experiential and functional opportunity. The interface of a plot to the public realm is manageable in this respect because it is more conducive to an informal interaction scale which larger units overshadow, inhibit or simply do not encourage in humans because they do not afford sufficient variety” **(Thwaites et al., 2013, p 41)**. Plots are liable to enable differentiation between wide or narrow frontage plots and between those with a long or short sides on the edge of the block **(Kropf, 1996a)**. In order to improve or develop and even add a new building in an existing urban context, **(Kropf ,1996a, p 729, 731)** suggests that, “for a new building to be approved within a given zone, first the dimensions and proportions of the plot on which it is to be built must fall within the range specified in one of the plot types”.



(Marshall, 2007) tends to use ‘*street syntax*’ which refers to the way that the constituent elements of streets connect. Marshall defines four relationships between the street network and the adjacent buildings of the street itself. Firstly, the street pattern forms a continuous system. Secondly, plots of land are accessed from the route network. Thirdly, buildings connect directly to the outdoor space, or may relate to each other without the need to go outside. Finally, all buildings plug into a plot on the ground (Marshall, 2007, p 74-75).

2.3 Building

The first interaction between people and street life might start at the edge of the building. The edges of buildings, however, express the main character of the street, and organize the relationship between two domains (public and private) with other median spaces. Even though the buildings are, morphologically, less stable than the street and plot, they play a key role in attracting people and shaping the activity whether inside or outside the building. (Oliveira, 2016) tends to use the system of the building in the introduction of buildings and their role in forming the street system; this is because they consider the most visible element in comparison with other urban elements. (Oliveira, 2016) mentions two different types of building, ordinary and exceptional. Aside from the utilization, the form is most significant when differentiating between these two types. (Kropf, 1996a, p 729-731) states that, “the arrangement of buildings and the type of component building must correspond to one of the range set out in the prescriptions... Since the goal of the plan was primarily to maintain the existing character of the town, the zone boundaries and regulations correspond for the most part to the tissues identified in analysis .”

(Hillier and Hanson, 1984, p 183, 197) state that, “a building type may be defined in general as a characteristic genotypical transformation of the underlying abstract model of a building, realised in, and identifiable through, a certain arrangement and parameterisation of the basic syntactic dimensions”. In a related development, “there are no principles by which it can be said that in any conditions whatsoever a particular relationship has a certain social reference. Yet buildings are analysable, provided they are approached with a model that looks first for the global genotype, then for the fine-tuning of particular relationships in particular locations”. Hillier offers a description of the urban grid in relation to a building pattern, where it is “the of groups of contiguous buildings in outward-facing, fairly regular clumps, amongst which is defined a continuous system of space in the form of intersecting rings, with a greater or lesser degree of overall regularity” (Hillier, 1996b, p 59).

(Van Nes and López, 2007) state that the pattern encompasses buildings where their entrances directly face the street. The entries in the second pattern tend to be located relatively apart from the street by creating new spaces, such as semi-private and semi-public. The same mechanism can be seen in traditional shopping streets in terms of the high density of shopping units with a direct



connection to the street compared with modern shopping centres. The edge of buildings can be considered interactional interfaces and play an essential role in identifying the relationship between the inside and outside, private and public, and residents and visitors. Moreover, people seek in-between spaces or the street in order to interact with others, the place and the surrounding environment. People, however, tend to develop their experiences toward space and its occupants **(Can and Heath, 2015)**.

(Hillier, 1996b) mentions the physical and functional city as the location of the most significant and complex artefacts that humans make. Physically, cities seem like assets of buildings that are linked by space and infrastructure. As their primary purpose, they support economic, social, cultural, and environmental processes. Ordinary buildings mostly constitute the city. They reflect the resemblances in terms of, for example, the regulations, function and utilisation, such as residential buildings, commercial buildings or mixed-use. Meanwhile, the second type represents a few buildings within a city; because of their form and function, these are designed for people to notice them, and they eventually, they become distinguishable from the entire structure of the city that they are an element of **(Oliveira, 2016)**. Two interfaces define the relationship between buildings and open spaces: firstly, there is a close relationship between occupiers within the building and those who are outside. Secondly, there is a natural merge between people who are utilising the space outside the buildings, and those who are moving through the street **(Hillier, 1996b)**. **(Nooraddin (1998, p 7)** states that, “the relation between the indoor space of buildings and outdoor public open space has continued to have importance in ensuring human contact with nature and community. The wall which divided the two spaces served also as a mediator with entrances and windows”.

The character of the street might be discussed in relation to the location of the building within its plot. Aligning the edges of the different buildings contributes, to a large extent, to the designation of the street form. The street width and how the building stands within its plot also operate together to identify the street pattern and its own function. Moreover, a building’s height and proportion to the street width, also contributes to the regulation of the street form. Reduced value of containment will be conceived when the building height is less than the street width and vice versa. The façade of a building and its detail is another essential factor that should be considered **(Oliveira, 2016)**. Also, the location of the building with the street pattern is a critical point in formulating the street edge where the position in an urban grid tends to have higher densities of development to take advantage of, and higher frequencies will, in turn, have a multiplier effect by attracting new growth, new buildings and new uses of land **(Hillier, 1996b)**.

According to **(Thwaites et al., 2013, p 112)**, “the academics produced a streetscape with a continuous building line whereas the users produced a much more crenulated building edge, comprised of varying levels of setbacks and projections. The study suggests that although both the academic and professional perspective is that building lines should be continuous, the evidence is



that users may prefer a more varied building line, as it is perceived to be more open to opportunities for social activity”. **Jacobs ,1961, p 388)** states that, “an importance in city appearance out of all proportion to the physical space they occupy ... some eye-catchers are eye-catcher just by virtue of what they are, rather than because of precisely where they are: an odd building for instance, or a little group of differing buildings standing out, because of themselves, in the wide-angle view across a park space”. Jacobs calls eye-catchers features to attract attention that are highly visible; they relate to the location but appear as an exception to the surrounding environment. Such a city “where there is mixture in building ages and types, and where there are opportunity[ies] and [a]welcome for many people's plans and tastes, eye-catchers of this kind always turn up, and they are more surprising, various and interesting than anyone, aiming primarily at city design, could deliberately plan” (**Jacobs, 1961, p 388**).

(**Jacobs ,1961**) suggests that districts and streets have mingled types of buildings, which vary in age and condition to serve different economic purposes. All these conditions, according to Jacobs, must be sufficiently dense and in turn lead to a concentration of people. Furthermore, even though (**Cantacuzino ,1994**) concentrates on individual buildings, he distinguishes six criteria in order to ensure a ‘good building’: order and unity, expression, integrity, plan and section, detail, and integration. (**Carmona et al. ,2010, p 192**) state that, “Although the height of buildings is not necessarily of significance in achieving human scale, the articulation of facades and the visual interest at pedestrian level is. As noted previously, a building can be understood to be of a human scale or not and, separately, to be in or out of scale with its surroundings. Certain scale-giving elements, such as windows, doors and construction materials, are particularly important because we have a clear perception of their size relative to that of our own bodies.”

(**Hillier ,1996a**) defines buildings as a persistent object with a primordial purpose; this was the original reason for buildings and therefore constitutes a kind of continuing essence. He launches a considerable number of descriptions to distinguish between a building and public spaces and the interactions between them socially and functionally. He states that, “at the most elementary level, a building is a construction of physical elements or materials into a stable form, because of which a space is created which is distinct from the ambient space. At the very least, then a building is both a physical and a spatial transformation of the situation that existed before the building was built” (**Hillier, 1996a, p 21-22**). According to (**Hillier ,1996a, p 21**), “buildings are normally multifunctional: they provide shelter from the elements, they provide some kind of spatial scheme for ordering social relations and activities, they provide a framework for the arrangement of objects, they provide a diversity of internal and external opportunities for aesthetic and cultural expression, and so on”. He refers to two interfaces; the inside and outside of a building, and comments on the nature of the relationship between them.

(**Hillier ,1996a, p 158**) argues that, “the effect of apparent rules about how buildings relate to open space is to create two ‘interfaces. First, there is a close relation between those within the building,



and those outside. Second, there is a natural mingling between those who are using the space outside the buildings, and those who are passing through". For this reason, the location of the building tends to be chosen when it has "higher densities of development to take advantage of this, and higher densities will in turn have a multiplier effect. This will in turn attract new buildings and uses, to take advantage of the multiplier effect" (Hillier,1996a, p 169).

(Kostof ,1992, p 214) states that, "this concern for a decorous street entailed a long-term program of defining the street space within [a] firm, continuous street walls and, to the extent possible, controlling the overall design of these walls. At the crux of the matter is the relation of the street line to the building line. When the two are congruent, the structure of the public space is unequivocal. As abutting buildings arbitrarily, pushback from the street line or protrude beyond it, an ambivalent spatial zone is created along the street channel which blurs this structure". Also, (Kostof ,1999, p 256) argues that, "the creation of continuous street walls that will enhance the perspective drive of the street channel begins in earnest during the 16th Century ... where ... buildings are integrated with the pattern of movement defined by the street ... the building fronts seen as expressive masses, stepping out into, and interacting with, the street space."

(Cantacuzino ,1994) offers six criteria to ensure a good building. (1) Order and unity, which represents symmetry, balance, repetition, the grid, the bay, and the frame. (2) An expression related to the function of a building. (3) Integrity that can be a result of strict adherence to the principles of design, this entails a sense of diversity between different principles. (4) A plan and section; this "is concerned with the building as a whole and the need to take into consideration not only its elevations but also its plan and section". (5) A detail that refers to ornament or decoration. (6) An integration, which is governed by the relationship between the building and its surroundings (Cantacuzino ,1994, p 69-76).

2.4 Block

(Bourdic et al. , 2012, p 594) suggests that, "the block area depends highly on local architecture and on the form and relationships between buildings. The block is a highly versatile form with a millennia-old history and looks different for each civilization around the world. The block is the built part framed by street". In the traditional and historic area, a block tends to correspond to coherent and compact buildings. The high-rise building is forcibly implanted within traditional\historical areas and corresponds solely to itself with little consideration of the surrounding urban structure. Arguably, people in modern spaces tend to stray from their humanity; endless spaces, roads, blind blocks which strip down details and a lack of human scale can make these cities repulsive to humanity (Gehl, 2010a). Jacobs (1961, p 186) states that, "frequent streets and short blocks are valuable because of the fabric of intricate cross-use that they permit among the users of a city neighborhood". As a street is designed to serve more than one primary function and activity, blocks are required to be short, and streets and opportunities to turn corners need to be repeated. In this respect, (Bourdic et al. ,2012) refers to the potential value of a short block and its role in the urban context; these blocks work to maintain the coherence and consistency of the



urban fabric, where the “morphological parameters are particularly increasing on the block scale and in urban configurations consisting on adjoining or homogenous buildings” (**Salat, 2009** cited in **Bourdic, Salat et al. 2012, p 594**).

The idea of the short block becomes a significant theme in designing new neighbourhoods and in examining and analysing the urban structure or raising the claim to maintain current urban areas. The main aim is that a short block is likely to “provide pedestrians with a network of sidewalks, crosswalks, and walking trail. The street pattern is largely grid-like, with block lengths of 400 to 600 feet and many 4-way intersections-all indicators of high connectivity and high level of pedestrian service” (**Shay et al., 2003, p 15**). (**Marcus ,2000, p 36**) argues that, “a tradition of urban planning and design existed with roots going far back in time ... it was ex-pressed in cities with streets and blocks with a clearly defined streetscape - however - this traditional was replaced ... by functionalist urban planning and design, that among other things was expressed through a dispersed urban space with free-standing buildings”

2.5 Street

Streets, regardless of their classification (cul de sac, connected and main or locally, regionally, and so on), work as a coherent platform. This unified network platform also defines the relationship between the public and private realm. The foremost aim of the street network is to link buildings and enable the flow of pedestrians and non-pedestrians. Streets offer a more practical sense than a national one in characterising urban space, where people meet and interact with each other. It is a democratic space for interacting, socialising and communicating with people. Morphologically, the street is steadier than other urban components, which tend to change over time. The plot pattern offers more resilience than the street network; this is followed by buildings that were more exposed to dramatic change (**Oliveira, 2016**).

(**Oliveira , 2016**) illustrates that the main character of a street is organised by other urban elements, such as plots (whether on the one side of the street or both), building heights, and how buildings are situated within the plot. A street is characterised by its shape, size, the nature of its relationships to other streets, its position within the network, its function and its value regarding its implicit meanings, such as historical value, cultural value and the experiences of people. (**Hashim et al. , 2014**) denote that the common ordinary function of a street is to enable different patterns of movement between places. The street is an open space that settles between physical elements within an urban structure, including various types of spaces like pedestrian walkways, roads sitting areas and public amenities. They have the primary purpose to accommodate human activities.

Marshall distinguishes four different typologies of the street, which are labelled as an ‘ABCD typology’. These types are extracted from different urban analyses featuring various stages of the city’s growth. The A-type is a typical pattern that can be observed in so many traditional and historical cities, particularly walled cities; it is characterised by the, “angularity of routes, oriented in a variety of directions, generates a rudimentary radiality, where such a pattern is located at the core of a settlement” (**Marshall, 2005a, p 84**). The B-type is a typical planned pattern of a street that originates for extension purposes or for newly founded settlement; it is distinguished by “four-



way perpendicular junctions [and] naturally gives rise to bilateral directionality, with the implication of a grid form at the wider scale” (Marshall, 2005a, p 84). The C-type refers to the most common pattern that could be seen at various locations of a city, “but most characteristically astride an arterial route, whether constituting the central armature of a village, a whole settlement or a suburban extension along a radial route” (Marshall, 2005a, p 84).

The C-type stands for the modern hierarchical pattern of a street network including curvilinear layouts of distributor roads, forming looping or branching patterns. It can be described as a “distributory, connoting a combination of distributor and tributary with a hint of disurbanity” (Marshall, 2005a, p 84). The ABCD typology can be interpreted in terms of structure and configuration. The structure is used to distinguish between the narrow, crooked streets of the A-type, the straight orthogonal streets of the B-type, and the sprawling curvilinear patterns of the D-type. In terms of configuration, it is possible to distinguish the connective properties of the B-type versus the tributary properties of the D-type. (Fig 3 and 4).

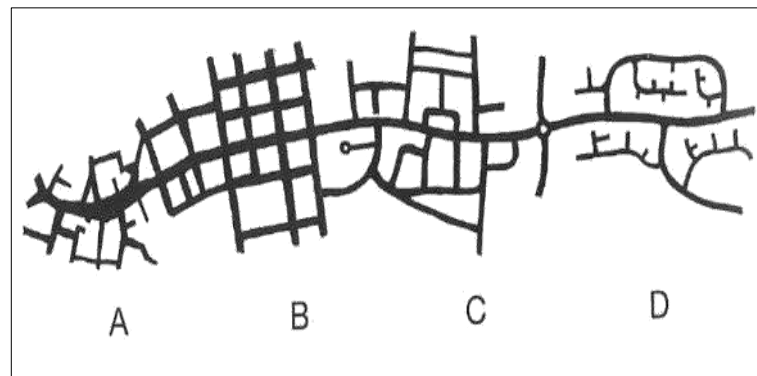


Figure 3. ABCD Typology. Source: (Marshall ,2005a, p 84)

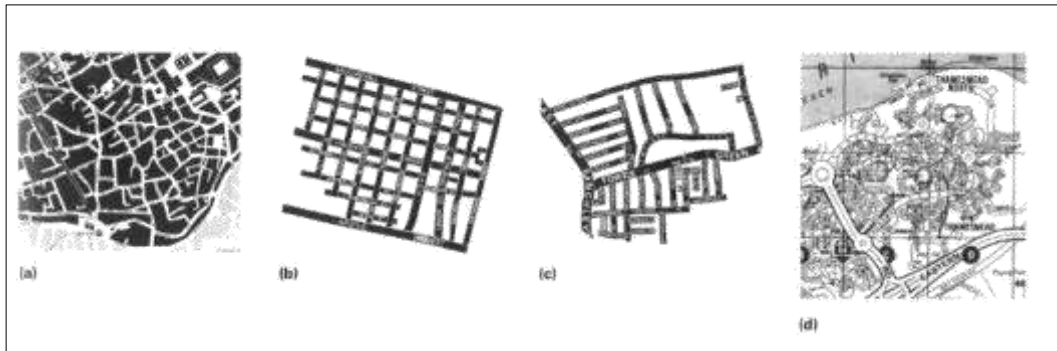


Figure 4. Examples of ABCD street patterns; (a) Tunis, (b) Glasgow, (c) East Finchley, (d) Thamesmead. Source: (Marshall, 2005a, p 85).

The mechanism of dealing with a street has dramatically changed between the pre-modern, modern and post-modern. The street has often been considered a social aspect, as a setting for political expression and struggle, and the locus of cultural identity. In the modern view, traditionally attributed variously to traffic engineers, municipal authorities, and the motoring public; streets became a network for traffic aside from their social dimensions. Later, several attempts called for a revival of the street as a social milieu for various activities and events (Marshall, 2007). Thus, it is important to re-read the streets as a social milieu rather than merely as a channel for motor movement and as an aesthetic element (Loukaitou-Sideris and Banerjee, 1998).

(Jacobs, 1961, 372) writes that, “when we deal with cities we are dealing with life at its most complex and intense”. One of the key components of a city is its streets, which provide the principal scenes in cities. Unity is a crucial factor, not in terms of its physical aspects, but also as the social and economic dimensions to create a harmonious neighbourhood. Thus, “successful street neighbourhoods, in short, are not discrete units. They are physical, social and economic continuities - small scale to be sure, but small scale in the sense that the lengths of fibers making up a rope are small scale” (Jacobs, 1961, p 121). (Khder et al., 2016) refer to seven fundamental principles that define the walkable street: connectivity, safety, accessibility, comfort, convenience, engagement, and vibrancy. Every principle has an active role in shaping the street to meet people’s needs and desires. These principles are governed by physical elements which affect the quality of both the built and natural environment.

(Carmona et al., 2010) write descriptively about the street and state that it can be perceived as a linear three-dimensional space, identified by the building’s edge on one or both sides. It can be analysed in terms of its many polar qualities, the amalgamation of which offers a spectrum for diversity: visually dynamic or static, enclosed or open, long or short, wide or narrow, straight or curved, and formal or informal architectural details. They also offer other considerations about the street edge in terms of its scale, proportion and rhythm of a street’s architecture and its connections to other streets and squares .”

(Engwicht, 1999, p 9) states that, “street reclaiming is a technological leap beyond traffic calming. Not only does it reduce traffic volume and speed in your street, it helps reclaim your street as a



place for play, social activity, and community building. For thousands of years, streets have been the epicentre of the social, cultural, and economic life of cities”. Thus, by reducing connectivity and social interaction through the loss of social space for urban activity, major urban roads can represent an obstacle to pedestrian movement. According to **(Carmona et al. (2010)**, “cities around the world sought to change the character of urban road - and to re-discover them as ‘street’, ‘avenues’ and ‘boulevards’, and to conceive them as connectors rather than dividers .”

Regarding the street as a public space, “the only legitimacy of the street is [as a] public space. Without it, there is no city. Practical needs - access to [an] adjacent property, [a] passage of through traffic - come to mind first because they are obvious. But the fundamental reality of streets, as with all public space, is political. If the street was an invention, it set out to designate a public domain that would take precedence over individual rights... The street, furthermore, structures community. It puts on display the workings of the city, and supplies a backdrop for its common rituals” **(Kostof, 1992, p 194)**. Moreover, **(Engwicht ,1999, p 13)** states that, “for centuries, people have felt that the street in front of their house was an important part of their home territory. Home was not just the dwelling in which they ate, slept, and procreated. Home embraced the street on which people lived, the marketplace, the street leading to the marketplace, the landmarks, the public buildings, and dozens of special places”.

3. POTENTIALITY

A city does not emerge independently; rather, there are substantial factors that contribute, collectively and gradually, to propagate its vitality. The first factor could be the natural resources and ecological considerations. Another classification relates to the main reason for its existence, such as for politics, defence, trade, and so on. For analytical purposes, scholars mainly use this classification to refer to the old cities in history. However, even cities with these classifications are based on potential factors, which make the performance of a city enough immensely. Terminologically, this could be called Pre-emergence. Furthermore, **(Stewart ,1947, p 180)** suggests that “cities are anchored in place by special often topographic” features. However, the scope of this research instead focuses on the existing city. In dealing with an existing city this is called Post-emergence. **(Hillier et al. , 1993a, p 32)** write descriptive-y about the natural movement and the potentiality of using space by stating that “urban grids seem to be structured in order to create, by the generation and channel-ling of movement, a kind of probabilistic field of potential encounter and avoidance”. Hillier addresses the potential pattern and its determination of the relationship between the private and public by stating that, “it is very difficult for more than one person to use a single sequence of spaces. It offers little in the way of community or privacy, but much in the way of potential intrusion” **(Hillier, 1996a, p 31-32)**.

According to **(Hillier ,1996a, p 31-32, 154)**, “the branched pattern, on the other hand, offers a definite set of potential relations between community and privacy, and many more resources against intrusion. These differences are inherent in the space patterns and would apply to whole classes of human activities patterns ... [and the] ... space is given to us as a set of potentials, and that we exploit these potentials as individuals and collectivities in using space”. **(Carmona et al. (2010, p 207)** argue that, “the basic movement patterns suggest potential movement and activity within a location.” In this regard, “if a space is poorly located within the local movement pattern,



it matters little how well it is designed as it is unlikely to ever be well-used unless there are changes in the wider area - either greater density of uses or changes to the movement network that increase connectivity and/or reduce severance (i.e. through better quality connections or by new connections ... Conversely, if the space is well-located within the local movement system, then upgrading the space and environmental improvements is likely to have a major impact on the density of its use .”

(Engwicht , 1999) distinguishes two types of space in a city; exchange place and movement space. The relationship between these two types help to make cities exciting and attractive places as long as there is a diversity and density of potential exchange, where “the more diluted and scattered the exchange opportunities, the more the city begins to lose the very thing that make it a city: concentration of exchange opportunities” **(Engwicht, 1999, p 19)**. **(Oliveira , 2016)** discusses the meaning of the natural context that plays a significant role in forming a city and its elements. Ecologically, natural resources are termed geomorphology, and should be preserved to ensure a growing city’s sustainability. Moreover, the terrain quality and suitability of the land, the climate (wind, solar and natural elements, such as trees, rivers and other water bodies) could be classified as potential influences on how a settlement emerges and grows **(Oliveira, 2016)**, These features are considered pre-emergence .

In the city, the natural elements work in combination with physical features which are produced humans; thus, the challenges and rivalries will trigger a new age for a city including how to strike a sustainable balance between the natural elements and built environment. **(Oliveira , 2016, p 11)** states “... from the first paths and streets (and, subsequently, from all the infrastructures that will be built in the streets) to the way land is subdivided into a number of different parts, to the various buildings that are built in these plots, and even to the materials that ... will give expression and surface to all these forms”. The meaning of Pre-emergence and Post-emergence accord with **(Marcus , 2000, p 19)** description of the city as, “an edifice in its own right with a high degree of actuality, as opposed to potentiality, that is the city, or parts of the city, as a realised architectural composition, rather than a continuous process of building”. Throughout its progress, the city tends to deal with its synthetic elements more than the natural setting. Thus, the urban inventions produced by humans within the built environment, with their own components in terms of space, building, street network and the other related details, will govern the trend of the city’s growth.

4. CONCLUSION

This paper referred to the elements of the urban form as the origin of morphological studies and examined their role in formulating the urban structure as a spatial configurative pattern. The plot, building, block, and the street system are ingredients of the urban form aside from the potential pattern, which signifies the ability of the urban structure to deal with other aspects of urban context usage, such as behaviour and activities. This importance comes from the primary aim of the physical elements of urban pattern, namely, to bind these patterns in the way of understanding the ability of the urban ingredients in sustainable development. Scaling the urban components would probably contribute to the consideration of urban potentiality when coming to the other aspects of urban studies such as resilience and sustainability. The significant transformation in the urban structure of a city had an impact on the traditional area of the city. Two directions of morphological



change affected the historic neighbourhoods. The first was related to the historical parts regarding the adoption of new policies, which dealt with the oldest urban elements and the organic pattern of the street network. The new modern era intended to change spatial configurations through the different relationships between the urban ingredients, and the relationship between the private and public influenced on the street edge. The second direction comprised a genetic mutation in the underlying order between the historical part of the city and the surrounding neighbourhoods. This included two fundamental elements: street and plot. From the spontaneous approach to generating a city's components to the pre-planned model, a critical gap arose. Furthermore, transforming the study of the old fabric from a rigid to a vital vision is needed to enable more focus on the historical region of the city.

Defining the urban elements and their interrelationships played a significant role in developing a concrete platform to understand the fine-scale influences, which ranged from the micro-level to the global scale. The spontaneous generative order follows a bottom-up process in deriving the plot as the smallest urban unit. In contrast, the pre-planned system is subject to a top-down approach in producing urban elements. This notion is critical when dealing with traditional areas and considering the extent to which new policies and regulations should be formulated in a way to meet the underlying order of the historical urban area of the city. The way that the buildings constituted the street space and the relationship between the private and public realms contributed significantly to formulate human activities and how people respond to the adjacent edge.



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