A COMPARATIVE SPACE IDENTIFICATION ELEMENTS ANALYSIS METHOD FOR DISTRICTS: Maslak & Levent, Istanbul

Abstract

Architectural and urban scale decisions have social, cognitive and even cultural consequences to form an interaction platform between man and built environment. People get used to live in space, give names and assign adjectives to streets and buildings, memorize for wayfinding, get attracted or distracted, sometimes get disappointed, but always have to read the “urban identity grammar”. To achieve the purpose of excellent space quality a city must have a clear “identity” with all its minor and major parts. This is an important matter for any metropolis in the world like Istanbul for a higher standard of urban living. This paper takes Lynchian theories as a basis for investigating “space identification elements” of an urban environment, adds space syntax theory elements for analyses and gives an extended method for understanding identity of a specific district of a city by comparing two major districts of Istanbul: Levent and Maslak.

Identity of the Built Environment

Cities are dynamically in the process of a rapid change and evolve new physical forms in their geographical environment. The most difficult and interesting question about the cities is this: exactly how is the physical city linked to the human city? (Hillier, 2005) They orientate their citizens to new complex life styles through a complex interaction of natural, social and physical built environment. So built elements become the most critical forms in terms of influencing the “urban identity” both in negative and positive ways within a short period of time.

The term “identity” refers to “lived experiences and all the subjective feelings associated with everyday consciousness, but it also suggests that such experiences and feelings are embedded within wider sets of social relations” (Rose, 1995). “Urban identity” comprises all physical and perceptual features of the urban environment which are the combination of culture, tradition, social structure, and the needs and functions of the built environment formed in time.

Keywords:
Urban identity
Visibility
Integration
Legibility
Accessibility

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Proceedings, 6th International Space Syntax Symposium, İstanbul, 2007
In the process of urban identity formation there is a strong relationship between perception of the environment and human behavior. Wayfinding and a collective consciousness against emotional and physical elements of the environment can only be driven by a “legible” city. The legibility of the city is the ease with which [a city’s] parts can be recognized and can be organized into a coherent pattern. A legible city becomes an “imageable” one. Imageability is the quality in a physical object which gives it a high probability of evoking a strong image in any given observer (Lynch, 1960). In relation with the experience of the city, an imageable city with an easily legible milieu will have a potential to have a unique and discernible identity that a person can recognize or recall a place as being distinct from other places (Lynch, 1981). Therefore, identity can be defined as “a syntactic series of meanings and images assigned to a legible space as a result of perception in mind”.

Identity Analysis and Space Syntax Theory

A city is an organism living with all its citizens. Any theory on urban space and its resultant identity must refer to both the physical configuration of the city and the psychological and physiological peculiarities of all the people living in it. Urban space theories are highly concerned with the aim of “enhancing urban life quality” which is also a basic target of “Space Syntax” researches. As researchers on “Identity” and “Space Syntax” have common aim, studies of identity analysis on urban space can be supported by space syntax works.

Space Syntax researchers have also recognized a high quality environment to be easily navigable, well recognized, legible and comprehendible parallel to identity researchers and gave a different name for this quality: “intelligibility” (Hillier, 1996). The definition of intelligibility concerns the relationship between local visual cues (e.g. the connectivity of a space) and the global properties of a space within a system. An intelligible world supporting strong relationship between observer and global-local properties of space assists navigation in space and helps the formation of “urban identity” within cognitive limits.

Space Syntax encompasses a set of theories and techniques for the analysis of spatial configurations, gives a graphical representation of space, quantifies, describes how easily legible any space is and can give important clues for cognitive fundamental modeling reference on “urban identity” analysis, but individually will not be enough to handle with identity theories and can be considered to assist them.

A typical approach in space syntax is to construct an axial map for public space and axial lines are drawn based on a two-dimensional map, and fail to express three-dimensional changes in the space, namely height. In the conventional application of space-syntax, a single axial line can express a straight road, whilst a curved road may need more axial lines to represent it (Yasami, Kubat et.al., 2003). Space syntax theory has also difficulties to take into account width-height proportions, land use, and its sensitivity to boundary conditions, effects of architectural diversity in cognition of an urban space, topological representation, insensitive to irregularity, ignores natural elements such as trees, 2D elements like lakes, rivers, seas and etc. which may be a primal attractor of the analyzed region.

Identity Analysis Method

There are two parts in urban space according to space syntax theories: one is the solid part as buildings and the second is void as streets and junctions. Streets are the most important organizational elements of the urban development process (Appleyard, 1970), because all the other components are formed around, in or out of a route. Street with a known starting and target point gives a person a
sense of orientation, way finding and important clues for “urban identity”. Most of the researches after Lynch have shown that routes and especially are the most used elements for the legibility of an urban space, so the identity of a street designates the identity of a district. The sum of these properties forms the “urban identity grammar” of a city.

Identity formation of the streets in mind can only be achieved by dividing the street into sub-properties. These properties are necessary to be exposed in order to constitute an imageable city form in mind and can be managed by the relationship between streets and buildings. Taking former studies (Erem, Şener, 2003) as a basis in our analysis we determined three street properties that affect the formation of identity: physical, perceptual and functional.

**Physical Street Properties**

a. **Formal properties**: A street can have linear, curvilinear, composite, grid or radial form. Curvilinear or composite streets may be decomposed to sub-linear vertexes with multi number of functions. The mean “path length” from a vertex is the average number of edge steps to reach any other vertex in the graph using the shortest number of steps possible in each case. This “axial line graph” measure has a long history stretching back as far as Wiener (1947), and is pertinent to visibility graph analysis due to the parallels with the use of integration in space syntax theory (Hillier, Penn et al., 1993), showing how visually connected a vertex is to all other vertices in the system.

b. **The width-height proportion**: It has a reciprocal relationship with human-scale. Building details, pavement texture, street trees, and street furniture are all physical elements contributing to human scale. Space syntax theory uses axial maps but these discard not only metric information about the city plan, but also all 3D information including width and height of the buildings. The urban grid is very rarely loaded in a uniform way. Building heights change from one location to another, thus modifying movement of people in streets. In the space syntax axial map a pedestrian pavement and an urban highway would be counted almost the same and becomes a handicap for identity analysis (Ratti, 2004). An additional survey becomes necessary like cross sections analyses of streets as graphic indicators in the third dimension.

**Perceptual Street Properties**

a. **Streetscape character**: It is specifically shaped by the boundaries between the elements that constitute the street wall or facade, and how those elements relate to each other in patterns that are consistent within a specific urban or suburban built environment (Kropf 1996). The noticeable differences in a streetscape provide a visual complexity. This complexity is related to position and rate of change of the viewer. The relationship between public and private spaces, expressed visually in the complexity of a streetscape, is an important determinant of its character (Alexander and Stark 2003).

b. **Enclosure**: Enclosure refers to the degree to which streets and other public spaces are visually defined by buildings, walls, trees, and other elements. S. Kaplan (1979) proposed four categories of environments that relate to enclosure such as open-undefined, spacious structured, enclosed, and blocked views. The presence of physiological response (Holden, 2000) against enclosure suggests it to be a crucial environmental feature. If a space is enclosed, then the depth of vision will be restricted. Three types of “enclosure” can be classified according to relation of buildings among each other: (a) contiguous building character on both side, (b) contiguous
character on one side and discrete character on the other side, (c) discrete building character on both sides.

c. **Accessibility of nodes**: City is a network of streets articulated with junctions. According to Batty (2004) there are two kinds of accessibility problems in traditional space syntax theory: Primal (relations between streets through their junctions), dual (morphological representation of relations between junctions through their streets). Primal problem deals with relationship between streets by the intersection of nodes where dual problem focuses on relations between nodes which are more identifiable urban elements. The flows among nodes are taken as linear such as streets and corridors within “junction analysis” in space syntax theory.

d. **Integration of streets**: “Axial line integration depth analysis” is one of the most favorite methods used in space syntax theory. Street depth represents the minimum number of changes (junctions) of direction to go from the origin to any other segment in the network. The outcome of the whole process is a major space syntax parameter: the so-called “integration”. The axial map is analyzed by assessing the number of steps it takes to get from one line to all other lines in the system. If the number of steps is low, then the line is considered integrated. Well integrated streets correspond to relatively high levels of movement (Hillier et al, 1993). Theoretically high level of integrity gives more accessibility and develops clearer “identity” than a less integrated part of the street in observer’s mind.

e. **Visibility analysis**: Visibility refers to continuity and connectivity within and between a site and its surrounding urban areas. Higher levels of visibility supports patterns of spatial accessibility that exerts a strong, regular and measurable influence on where and how people move through cities and where and how they stop. The focus of such analysis is on the relative proximity or “accessibility” between a clear representation of the strategic views from (or of) a given location. Space syntax visibility graphs analyze the extent to which any point in a spatial network is visible from any other. (Desyllas, J. & Duxbury, E., 2001).

**Results**

The results of the physical and perceptual properties analysis the chosen districts are as follows (*Table 1*):

**Formal properties**: In both regions streets have linear, curvilinear and radial formal properties. Radius value for Levent is 0,059 and 0,307 for Maslak. Radius might be seen as a limit to the complexity of urban network and Maslak seems to be more complex than Levent.

**Width-height proportion**: In Levent District it is 1/1 for west side of the main street while 1/8 for the east side in between Zincirlikuyu Cemetery and Bridge Highway. While moving along the Büyükdere Street toward north to Maslak this proportion changes to 1/1 for both sides. In Maslak District beginning with Bridge Highway military and university sites with high walls is seen on northwest and southeast side of main street with width-height proportion 1/15. This proportion changes to 2/1 in north side of the street as moving on to Sariyer.

**Streetscape character**: In both Levent and Maslak districts high-rise buildings give a changing streetscape character. In Maslak this difference is much more distinct than Levent.

**Enclosure**: There are high-rise buildings along the street in both regions. Disparity comes from urban pattern away from the main axis: low-rise buildings with discrete character in Levent, military and
university sites with green character that have high walls detaching relationship between the main road and these sites in Maslak. Contrary to low-rise and dense green areas, there are high-rise buildings on north side of the Büyükdere Street in Maslak.

<table>
<thead>
<tr>
<th>Levent District</th>
<th>Maslak District</th>
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<tbody>
<tr>
<td>Axial Line Path Length Analysis</td>
<td></td>
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<tr>
<td>Sectional Enclosure Analysis</td>
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<tr>
<td>Depth Map Accessibility Analysis for Nodes</td>
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<tr>
<td>Axial Line Integration Analysis for Streets</td>
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<tr>
<td>Visibility Analysis for Streets (Grid Size: 5x5 m.)</td>
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</tbody>
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**Accessibility of nodes:** Levent has more dense character than Maslak. Number of arcs and nodes for Levent is 1.8 times than for Maslak for the same square meter of area. Levent has more number of accessible junctions than Maslak district especially in between Zincirlikuyu Cemetery and Bridge junction expanding to the inside streets of Levent on the east side. In Maslak district the most accessible nodes are in between high rise buildings (Table 2).

<table>
<thead>
<tr>
<th>Number of Arcs</th>
<th>Number of Nodes</th>
<th>Arc/Node Ratio</th>
<th>Junction Probability</th>
<th>Dual Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levent</td>
<td>468</td>
<td>285</td>
<td>1.64</td>
<td>6089.4</td>
</tr>
<tr>
<td>Maslak</td>
<td>260</td>
<td>158</td>
<td>1.65</td>
<td>4762.6</td>
</tr>
</tbody>
</table>

**Integration of streets:** Main Street is highly integrated in Levent district, but minor streets behind high-rise building in Maslak. This correlates with pedestrian movement and repellent effect of fast traffic of street in Maslak region.

**Visibility:** The average distance between nodes for Levent is 7.53 and 5.89 for Maslak. The potential visibility level seems to be more for Levent region especially around Büyükdere Street.

**Conclusion and Discussion**

In this study, for investigating “space identification elements” of an urban environment, in addition to conventional identity analysis like, width-height proportion, streetscape character and enclosure where space syntax is used as a tool for examining formal properties, accessibility, visibility and integration conditions of two different districts: Levent and Maslak. In both districts high levels of integration has been seen around main streets. Because of dense traffic in major streets, the accessibility of pedestrian movement on these areas is restricted. Main axis detaches the relation between residential areas, high-rise buildings and shopping malls. To overcome this problem, we here need urban design projects that can encourage free pedestrian flow by overpasses and underpasses across the streets.

As the integration of regions increase, possibility for the legibility of physical objects increases parallel to formation of identity. This paper gives a new extended comparative identity analysis method by binding with space syntax analysis. We here provide a mutually
completed set of “identity analysis” adding quantitative space syntax techniques on to conventional qualitative former methods by eliminating defects of both in the maximum level. This extended method may help to form street layout master plans so that street connectivity and configuration provided a framework for flexible future growth for both planners and architects. For future work the correlation between Lynchian urban elements like landmarks, borders, districts and integration of the streets may be researched.

References


