

Elevating urban quality through Urban Legibility (case study of Al Zamalek neighbourhood)

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Abstract— the quality of urban life is one of the least considered aspects of urban developments in our local urban communities. Although the urban environment is supposed to be the reflection of the lives of its users. Their culture and history, their needs, dreams and desires. In our local Egyptian communities, there has been great loss of the expression of our character and identity within the waves of blind modern urbanism of the current built environments, or the new developments following western fashion trends of architecture. An urban environment that is easy to be realized and perceived is called a legible environment. Legibility is one of the most important factors for urban quality of life. A legible environment does not only mean the ability to read its spaces, but also means the organization of its urban elements with a certain visual imagery or a coherent pattern. It is a process that requires knowledge of both the physical spatial qualities and distinctive visual traits that creates a specific feeling or a mental image. This research paper discusses the elements of urban legibility in both physical aspects of study and their effect on urban quality of life. Then it analyzes a case study of Zamalek district to detect the effect of those elements over the quality of urban life.

Index Terms— Legibility, urban quality of life, spatial perception, mental image, built environment, visual distinctiveness, wayfinding ability.

1 INTRODUCTION

Legibility is one of the most important physical qualities in an urban environment. It provides sense of identity, character, and place. Architectural legibility requires both visual clarities of a building's appearance such that its formal, spatial, and material compositions can be comprehended, as well as a certain clarity of its social, cultural, and political histories. While on an urban scale legibility is embodied in the urban context, fabric style the quality and quantity of urban elements that support sense of belonging, identity, relatedness and way finding.

1.1 Definitions:

legibility in its general meaning: the fact of being easy to read, or the degree to which something is easy to read [1]

Legibility in urban design: according to Lynch, is 'the ease with which the city's parts can be recognized and organized into a coherent pattern'—legibility depends on Quality of the Built Environment in Urban Neighbourhoods.[2]

Legibility : is one of the principles of urban design. Legibility means the possibility of organizing an environment within an imageable and coherent pattern.

1.2 Reasons for the loss of Legibility in modern urban communities:[1]

1.2.1 The change in political systems: the cities no longer have high walls for protection against the enemies, those walls had caused a defined planning design which led to the loss of enclosure, exclusiveness and privacy of those cities therefore the loss of identity and character.

1.2.2. The change in economic systems: the industrial revolution and the resulting modernism that led to the following:

•The need for populations to recentralize around industrial cities therefore a huge need for large residential capacity.

Change of the building types: the need for large scale universities, factories, high density buildings or spaces instead of relaxed horizontal spread, large scale of villas, mansions or worship buildings.

•The rapid city growth in cities due to rapid growth of population. With the need for horizontal expansion and centralization at the same time this resulted in :

a-The competition between high rise towers instead of small buildings that include integrated urban spaces.

b-The loss of human scale that leads to a feeling of exclusion and repulsion.

c-the loss of the connection with the environment where users cannot breathe clean air, enjoy sunlight or enjoy enough greenery which deteriorates the physical and mental health.

d-High density population of both people and cars.

e-The destruction of values like the spirituality of worship buildings and the urban significance of important landmarks or historic areas that highlights the city image.

f- The appearance of non-planned urban communities like slums and unofficial housing.



Fig 1



Fig 2

Fig. 1: Slums In india (source: <https://www.citiesalliance.org/slums-and-slum-upgrading>)

Fig. 2: The absence of human scale, intimacy and connection to natural surrounding in metropolis cities.

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1.2.3. Intellectual changes in urban design ideologies: [3]

a-Repulsion away from traditional patterns due to need for new, dense housing requirements using modern construction technologies: The resulting urban communities suffer being static, still, unresponsive, irrelative and unsustainable by any means. Instead of the focus on enhancing the value of an urban community.

b-The effect of marketing trends and trending foreign fashions affecting modern designers: the blind following of Designs only serve either marketing purposes or fashions that do not relate to the surrounding cultures or environments but merely fulfilling the desired current trend for best selling opportunities.



Fig. 3: Hassan Fathi’s vernacular architecture that is environmentally sustainable in Egypt versus blindly following the European architecture in the mountain view project- Egypt.

1.3 Factors affecting the Degree and Quality of urban Legibility:[4]

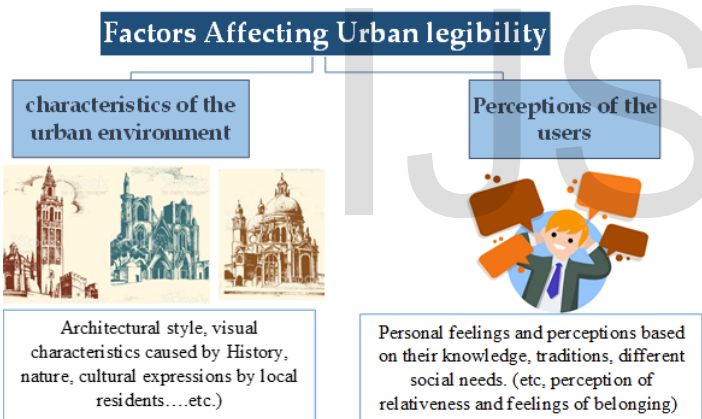


Fig. 4 :Factors affecting urban legibility (illustration by the researcher)

1.3.1. physical aspects of legibility characteristics of the urban environment (style, character and identity):

The presence of an architectural style or special visual character manifested in architectural elements features and design details, this includes tracing the origins or reasons for this character. The character of a place is embodied largely in the physical form itself. It is argued that a ‘sense of place’ or genius loci can be achieved through the careful design of spaces and buildings and the ensuing relationship between them [5]. According to the gathered literature those factors can be summarized as the following:

a-Implying the Cultural background, historic heritage or memories linked or afflicted over a certain place, building, street or an object.

b-Clear visible distinctive features created by man-made design or natural causes.

c-Creating new personal experiences: artistic, spiritual or patriotic.

a-Historic or cultural backgrounds:

There are several indicators to determine valuable buildings either its measured according to the era of construction, building materials or its significance to the residents’ lives or to the urban environment itself. The research discusses some classifications for those values in the following:

•Classification by Cullen according to type of buildings :

According to Gordon Cullen [6] valuable buildings are classified as followed:

I. Archeological value : buildings that date back to an ancient time and its value increases the older it stands. (Example: the citadel of Cairo- Cairo.)

II. Architectural / constructional value: either the building was designed by a famous architect or it representing a distinctive architectural/construction style.(Example: Hassan fathi’S new gouna village,luxor)

III. Relation to a distinctive person: a building remembered for a distinctive person of a historic, political or a cultural value who lived there.(Example: baron Impan palace, Hiliopolis,Cairo.)

IV. Relation to a memorable event : a building related to an important event.(Example : Abdeen palace ,Cairo.)

V. Relation to an important authority:an important governmental authority building.(Example: the parliament building.)

VI. Aesthetic significance:characteristics that signifies a building aesthetically such as:

- Local architectural style.
- Visual distinctiveness resulting from shape, material or scale.
- Foreign architectural style.
- Contextual distinctiveness as blending with the surrounding nature or different orientation.



New gouna-luxor by Hassan Fathi Baron Impan palace-hiliopolis, Cairo



Salah Al-din Citadel-Cairo Parliament building-Cairo

Fig .5 : examples of buildings of value according to Gordon Cullen.



Visual Distinctiveness- local character (Morocco) Scale(432park Avenue-N.Y.)

Fig .6 : Aesthetic significance.

•Classification by Roy Worskett according to a value repre-

mented by the building:

According to Roy Worskett buildings are classified according to their value as follows [7] :

I. Historic value : building related to historic area or events and this value is never affected by the state of the building.

This type has two indicators for value :

- Temporal indicators: related to the date of its construction.
- Symbolic indicator : relation to the era of construction.

II. Aesthetic value: its measured according to the design, level of crafting and materials used in construction or detailing Where a building is characterized by the following:

- Visual significance of the architectural style.
- Holding a rich Cultural background.
- Personal taste according to the users.

III. Social value: a type of value that exists with the type of one or different social activities held in this building and rises with the intensity and variety of activities.

IV. Functional value: relates to important events or functions whether they are still functions (like walls or barriers) or live activities like important events (like prayers or religious celebrations in mosques or political events like the congress).[8]

b- distinctive features created by man-made design or natural causes:

The visual complexity of the built environment : it is described as a feature of high-quality built environments in which there should be sudden visual contrasts ‘so an impact is made on the eye, bringing the plan to life’. [6]

Examples of visual complexity include:

- level changes.
- screened and unscreened vistas.(surrounding views)
- ornamentation and style.
- greenery and landscaping.
- General visual attractiveness.

Also the use of local architectural styles and materials has been argued to have a direct influence on people’s sense of a particular place making them feel safe and at ease.

C- Human experiences based on the Quality of Architecture and urban design:

Emphasis on beauty, aesthetics, human comfort, and creating a sense of place; Special placement of civic uses and sites within community. Human scale architecture & beautiful surroundings nourish the human spirit.

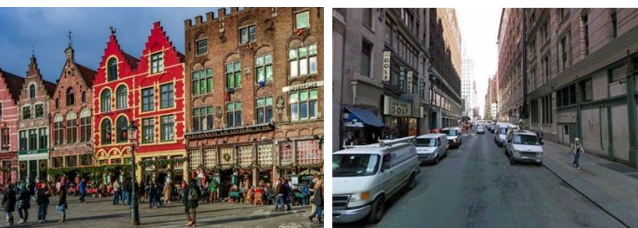


Fig .7 : the visual pleasure ,livability and comfort an aesthetic design adds to an urban environment.

1.3.2 Perceptions of the users

Why do people choose a certain building or object as a reference? Or why is a building known? These questions are important to conceive both in the human mind and the position of designed buildings/spaces in the human mind. Perception can be described as a process in which sensory input are transformed into meaningful experiences and interpretations. However,

what makes perception is that this process is subjected to inner and outer influences. A mental image is identified as the picture-like representation of the perceived phenomena in the human mind., [9]

1.3.2.1 mental image: the degree of perceived legibility depends on the ability of space to form a mental image.[10] .Kevin Lynch noted the landmark (an object whose salient physical feature is uniqueness) as one of the five image elements (landmarks, paths, districts, edges, nodes). According to Lynch, if any landmark has a clear form, clearly contrasts with its background, and has a crucial location, then it can be considered important.

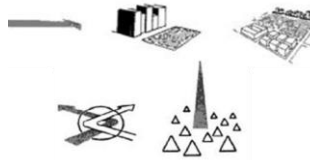


Fig.8: kevin lynch elements of forming mental image

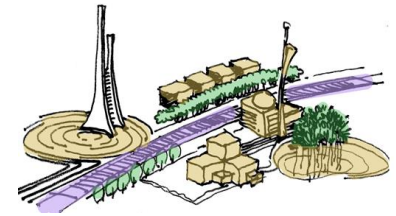


Fig.9: legible urban environment(sketch by the researcher)

1.3.2.2. Spatial configuration:

Spatial layout not only affects movement and circulation, but also helps one to understand the relationship among spatial elements and to form the mental image of this relationship. When it gets harder to perceive how one space is connected to the other,wayfinding becomes weaker.[11]

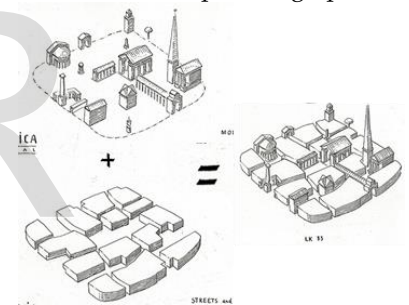


Fig.10 : Leon Krier vision of the true city. (source:www.architectural-review.com/essays/leon-krier-on-sustainable-urbanism-and-the-legible-city).

1.4 Nonphysical manifestation of urban legibility (imprint on quality of urban life):

- a-Sense of belonging and relativeness.
- b-providing strong sense of place and visual experiences.
- c-ease of navigation and way finding.

a- feelings of belonging and relativeness.

Visual attractiveness is a well cited as a feature of quality of the built environment that positively affects quality of life and residents’ satisfaction with an area; Claimed to contribute to residents’ feelings of attachment and belonging to a place [6] As a feature, it is often not defined with any clarity, described as visually pleasing and dependent on subjective opinions.

b-strong sense of place,: due to local character either designed based on an artistic concept that lived on for years after its creation by the designers or the enhancement of an existing cultural background.

c- Supporting the ease of navigation way finding ability.

-the ease of wayfinding and navigate through the area.it also requires certain character derived from the local context

and tradition.

1.5 Example on urban legibility: Paris,France.

Paris has been a very significant city combining between history and modernism. Its considered the most lively and most competitive city across europe. The city has a high degree of legibility where a visitor can clearly spot some important landmarks and reclaim a clear visual image that would have elements like the Eiffel tower, the arc de triumph or the Siene.



Fig 11 : legibility in Parisian streets

1.6 Field Study:

1.6.1. Introduction:This part of the research paper aims to apply the theoretical findings on one of the most elite neighbourhoods in Egypt. The in-depth study will aid to a more accurate analysis of the effect of urban legibility on the quality of urban life.

1.6.2.Field study objective: providing assessment guidance for the urban designers, developers, community and decision makers to evaluate the urban legibility of a certain neighbourhood in consideration with our local Egyptian culture, architecture and the needs and requirements of residents to either design or develop and enhance the quality of urban life in Egyptian districts.

1.6.3.Field study methodology:

The methodology of this case study is using the concluded standards and characteristics of the integrated urban legibility to apply it on the chosen case study. And assessing the quality of urban legibility. This study is more detailed in depth considering aspects such as the current circumstances, urban issues, and differences in Egyptian communities.

1.6.4. Tools and Process: the field study is based on three tools to reach the study objective

1.6.4.1. Literature Review Analysis criteria: The first tool is taking the literature review as the main guidance in setting a criterion for the site analysis. The assessment of urban features and society, To provide different approaches of analysis in aim of reaching the optimum analysis method for our local urban environments.

1.6.4.2 Observation and documentation: the researcher observe and records the elements of legibility manifested in the case study. This is applied by the researcher through several site visits gathering and analyzing data about the urban environment and residents' life traits, using photographic images and written notes as the main sources of documentation.

1.6.4.3 Questionnaires and interviews:effective qualitative tools especially for measuring quality of urban life based on the degree of life satisfaction. interviews and questionnaires are performed on at least 30 residents of different ages, gender and socioeconomic levels.

There have been three forms of questionnaires:

- a-Online Questionnaire on (google forms) distributed online across the community support groups of each neighborhood.
- b-Excel form questionnaire written in a simplified Arabic for the actual field study distribution on the streets.
- c-Formal detailed questionnaire form for the comprehension and detailed analysis of the researcher included in the annexes section at the end of the thesis.

The following are previews of those three questionnaires:



1.6.5 CASE STUDY OF ZAMALEK DISTRICT:

1.6.5.1.Case study overview.

Project brief: During the British occupation of Egypt in the beginning of the 20th century, several suburban developments were established on the periphery of the city of Cairo. These initially attracted the small British community and later foreigners and Egyptians, mainly from the elite community. Zamalek is one of These suburban developments, it became one of the fashionable residential quarters of Cairo. Until now Zamalek still represent a high class residential settlements with a very remarkable architectural style .[12]

location :Zamalek district is an affluent district of western Cai-

ro encompassing the northern portion of Gezira Island in the Nile River.

Reasons for choice:

- a distinctive architecture and special urban character that is clear in its elements which makes it highly measurable by the researcher and perceivable by the residents.
- The case is of adequate scale and limited by natural edges.
- It represents an old urban community of special European style and urban identity. It was established for the elite societies and faced several urban changes through the many years.



Fig 12 : al Zamalek neighbourhood.

1.6.5.2 The Analysis of the elements of Urban Legibility in Zamalek.

Style, character and identity : Zamalek is known for its beautiful buildings, the architecture is between the old buildings adapting artistic styles like art deco, art nouveaux, new colonial and eclectic in old buildings, villas and mansions, and there is the contemporary modernism in the new buildings.



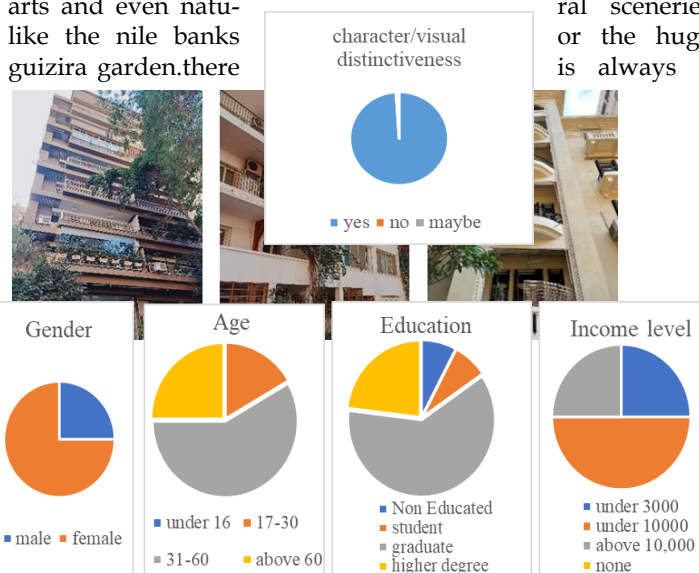
Fig 13 Old buildings of artistic architecture and ornamental details.

Fig 14 new buildings of contemporary architecture.

Signage and landmark: zamalek is highly legible to its resi-



dents due to many landmarks, important buildings like the opera house,cairo tower, clubs, faculties like faculty of fine arts and even natural sceneries or the huge guizira garden.there is always a



distinctive visual landmark in every area.

Fig 15 landmarks in Zamalek

1.6.5.3 Questionnaire results analysis:

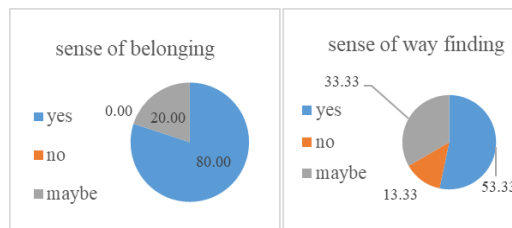
Demographic Data :

The most interesting outcome of the demographic data would be the high education and income level of Zamalek residents. Based on the questionnaire this refers to the high social class of the residents'. also the neighbourhood having special architecture style and a number of different cultural institutes is resulting in dense levels of culture and art appreciation.

1.6.5.3.Elements of urban quality perceptions in Zamalek:

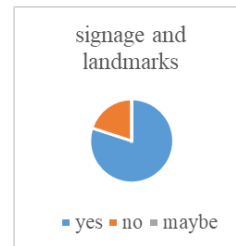
Legibility:

The questionnaire importance lies in surveying the residents feelings of belonging and way finding abilities as the non-physical indicator of Zamalek's legibility. Most answers show high levels of both indicators.



1.6.5.4 Interviews:

It had been noted that the attitudes and opinions of Zamalek residents is entirely different from the opinions of the outer district. Since Zamalek district had been subjected to urban changes that affected its core essence. So most of their opinions are negative and their frustration from outsider visitors and urban changes is clear. While Zamalek outsiders admire the architecture, nature, quietness, and the view of the Nile, they are more critical than visitors to the core essence.



et and classiness that differs Zamalek from everywhere else. The following notes had been recorded:

- The residents of Zamalek believe that the project of Ahl Misr walkway is going to facilitate and encourage and access for outsiders of lower social classes to not only overcrowd al-Zamalek streets but its commercial and leisure spaces as well.
- The concrete barricades around the parameters of almost all the embassies in Zamalek highly compromise walkability, they also provide bad visual exclusion and dullness and lessens the warmth and intimacy of the neighbourhood.
- The new metro station project through Zamalek is not needed but it was the better urban solution to remove the educational facilities needing the metro station. This project cause blockage of few streets for several years now consequently causing more congestion and deterioration of the quiet elite urban character with noise and concrete structures.



Fig 16 urban issues that affect quality of legibility in Zamalek.

1.6.6. The assessment of the Zamalek urban legibility:

based on the questionnaire applied on Zamalek residents, each branching element of urban legibility had a percentage number of agreement on its existence with an acceptable quality. These results were analyzed in the following:

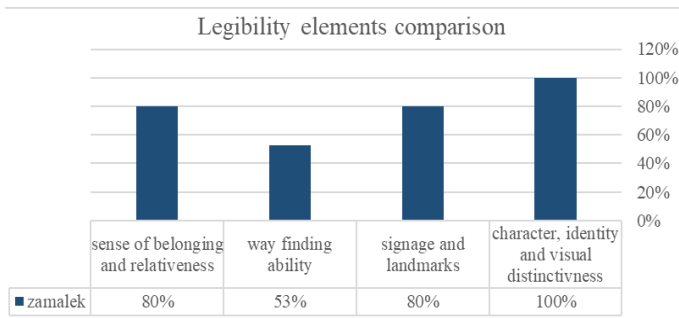


Fig 17 chart illustrating Percentage of agree on quality of urban legibility.

1.6.7 Discussion:

These results are based on the results of two field analysis survey tools:

First: the observation, interviews and survey taken by the researcher.

Second: the questionnaire results based on residents' opinions. The following is a discussion of the results of the field study:

- obvious research results show high legibility of Zamalek when it comes to architectural style and support of wayfinding abilities. Zamalek is a very old district its residents have strong feelings of belonging and relativeness.
- The residents in Zamalek are not quite satisfied about their

quality of urban life It shows in how hardly cooperative they have been in providing their opinions about their life in the neighbourhood.

-The urban changes and modifications and modern development projects are not satisfactory as they interfere with the urban context of quietness and elitness of Zamalek. Projects like Ahl Misr walkway and the metro invite even more outsiders into the district.

-The surveys showing how outsider visitors overcrowd both those neighbourhoods means that people in other areas are in great need for quality urban communities. Reasons such as the visual attractiveness of places with character, and the psychological comfort for places with high ratio of greenery.

- The older generation feels great connection and belonging to their neighbourhood but the new generations are forced to move out due to overpopulation and fast urban changes.

1.6.8 Field study Conclusion:

It is interesting that Studying a neighbourhood that is considered to be of highest urban quality and then realizing the effect of urban changes made by the government over the levels of urban quality and life satisfaction, the perception of quality by local residents expressing what they need, or desire in their places of living. Each branch of the urban legibility element is interconnected and affects other elements. Urban legibility does not only depend on the architecture style that signifies a neighbourhood from another and not only the number of landmarks but also to how those physical elements are related to the feelings of self-expression, belonging relativity, and way finding ability of the residents.

The field study provides a realistic perspective to the research on urban legibility quality in our local Egyptian neighbourhoods. It concludes the final detailed elements of urban legibility with both its physical and nonphysical aspects.

1.7 General research Findings:

Integral manifestations of urban Legibility:

The research results in an integrated methodology of measurement to asses all aspects of legibility in an urban environment. Since its one of the most important factors affecting the degree of urban quality. Those aspects are the following.

First: the physical Assessment of legibility:

It is the graphic examination of the key physical elements and functional character of the studied area. So based on the data gathered from the researcher on the case studies, a physical assessment of legibility can be conducted through two aspects:

A-The existence of the main urban vocabulary symbols (based on David lynch) :

- Edge
- Path
- Node
- Landmark
- District

B-The existence of indicators that evidences the presence of an architectural style or special visual character manifested in architectural elements features and design details, this includes tracing the origins or reasons for this character. (Historic origins, nature caused, cultural expressions by local residents....etc.)

Second: the nonphysical perception of Legibility:

A-The degree of legibility that would make people feel less anxious about their way finding ability.

B- The degree of legibility that would give people sense of belonging, intimacy and connection to their neighborhoods.

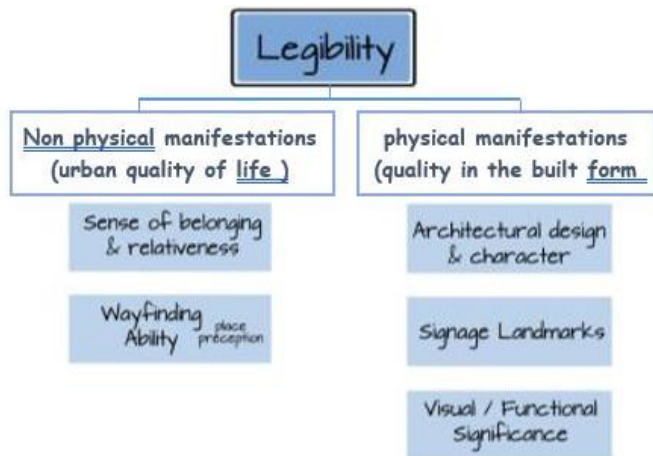


Fig 18 chart illustrating both aspects of urban legibility.

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1.8 CONCLUSION

In literature, the paper illustrated the two aspects of urban legibility, physical aspects represented in two elements; characteristics of space, and users' perceptions. And the nonphysical manifestations of urban legibility that affects quality of urban life considering residents feelings. The field study then applies those elements on a local neighbourhood to define the degree of urban quality that this element of urban legibility affected. It is concluded that urban legibility is one of the most important aspects of urban quality. urban designers or development projects should not neglect its importance in exchange for fast profits with no previous study of the existing urban context or the community backgrounds or aspirations.

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