

Urban Regeneration of Historic Paths: A Case Study Kom El Dekka Historic Path

Ahmed R. Ismail, Hatem A. El Tawil, Nevin G. Rezk

Abstract—Historic paths in today's cities are facing the pressure of the urban development due to the rapid urban growth. Every new development is tearing the old urban fabric and the socio-economic character of the historic paths. Furthermore, in some cases historic paths suffer from negligence and decay. Kom El Dekka historic path was one of those deteriorated paths in the city of Alexandria, Egypt, in spite of its high heritage and socio-economic value. Therefore, there was a need to develop urban regeneration strategies as a part of a wider sustainable development vision, to handle the situation and revitalize the path as a livable space in the heart of the city. This study aims to develop a comprehensive assessment methodology to evaluate the different values of the path and to create community-oriented and economic-based analysis methodology for its socio-economic values. These analysis and assessments provide strategies for any regeneration action plan for Kom El Dekka historic path.

Keywords—Community-oriented, economic-based, syntactical analysis, urban regeneration.

I. INTRODUCTION

HISTORIC paths are considered to be a former part of the city's image, which reflect the culture and the legacy of the city in one place, and carry distinctive urban and heritage values that need to be preserved. Also embrace many configurations and classifications which have been studied over years by urban planners and urban researchers to help as a tool for understanding and analyzing urban spaces within the city.

Nowadays, historic paths are facing a lot of problems which could be classified as; physical problems, socio-economic problems, and administrative problems. Those problems or reasons of deterioration should be analyzed in order to find a scientific methodology to deal with them.

Urban regeneration is a wide concept and represents a solution for the deterioration of historic paths. In order to face these challenges, regeneration concept should be a part of the sustainable development strategies.

This study is focusing on Kom El Dekka Historic Path as an example for historic paths in the city of Alexandria, Egypt. Aiming to define the path and its historic and heritage significance, develop a comprehensive assessment

methodology to evaluate the different values of the path, and to create community-oriented and economic-based analysis methodology for its socio-economic values.

Besides the qualitative and analytical methodologies, scientific quantitative techniques also should be used in computing the various values of the path, depending on the modern concepts of interpreting and analyzing the urban spaces and the spatial values of the space. Syntactical analysis system and software could be used to serve these aims on different levels, in order to turn out the analysis process to be a quantitative data-driven process, instead of being a qualitative process. Regeneration strategies should also consider the analysis of the social patterns that represents an indicator for the success of any regeneration plan. Also the different activities of the streets' community and users should be studied and analyzed, in order to achieve community-oriented activity patterns along the path.

Regarding the global economic concerns, dealing with the historic paths as heritage spaces that carry economic values became a necessity. Investing in heritage value became a trend and an effective tool in the development projects. Thus, it is essential to study and assess the economic values and potentials of the path.

Assessing the different values of Kom El Dekka Historic Path helps in developing a comprehensive analysis methodology that leads to evidence-based regeneration strategies, which helps in the urban development process of the district and the city as a whole.

II. HISTORIC PATHS

A. Historic Paths and Urban Morphology

In terms of urban morphology; historic paths represent an integrated part of the cities' urban pattern, and have been used as an effective tool to understand and measure the evolution of the cities' urban fabric, as dynamic urban spaces that carry urban heritage values. According to Kevin Lynch's classification [1], paths were one of the components of the city's image, which can conventionally be classified into five types of elements; paths, edges, districts, nodes, and landmarks. Lynch also put a definition for the path,

"Paths are the channels along which the observer customarily, occasionally, or potentially moves. They may be streets, walkways, transit lines, canals, railroads. For many people, these are the predominant elements in their image. People observe the city while moving through it, and along these paths the other environmental elements are arranged and related".

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Theoretically the urban spaces are characterized by enclosure, detailed treatment, and the activity that occurs in them. [2] Generically two types of urban spaces are prominent; linier and reservoir. Linier or corridor like type, includes the *roads, streets, and sidewalks* (footpaths), which mainly serve the circulation or transportation. Reservoir or room like type is mainly the *urban squares*, which accommodate various types of outdoor social activities like meeting, waiting, eating, watching, etc. In the case of the path, the two types of urban space could be found. Different types of spaces and urban elements could be seen in paths, such as streets, lanes, nodes, plazas, landmarks, water canals, bridges, gates, and portals. Paths also could be classified according to different basis:

(a) According to the evolution of the cities' urban pattern; [3] The ABCD typology has been developed with the intention of reflecting typical street patterns that are encountered in different kinds of urban analysis. The four types are best introduced by considering different patterns featured at different stages of growth of towns and cities, arranged as if stretching outwards from the historic core of a settlement to its outskirts Fig. 1.

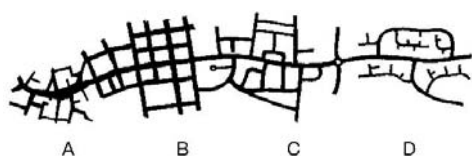


Fig. 1 ABCD typology of paths

(b) According to the scale and the proportions of the space, [3] Poundbury's hierarchy of spaces appears to place the square as the most prominent place at the top of the hierarchy; Square, street, lane, courtyard, mews, and pedestrian streets.

(c) According to the sense of the place and the scene, [4] Vitruvius classified the space to three kinds of scenes; one called Tragic, second, the Comic, third the Satyric. Their decorations are different and unlike each other in scheme.

B. Heritage Value of Historic Paths

Historic paths and paths that carry heritage value are urban spaces that have historic authenticity, and architectural/urban character with distinctive historic features, whether they had been established in ancient times or not that old. Those paths represent a part of the cities' urban heritage and have some or all of these values: Aesthetic value, symbolic value, spiritual value, social value, authenticity value, and the value gained from the public collective memory.

III. REGENERATION CONCEPT

A. Urban Regeneration and Sustainable Development of Cultural Heritage

In relation to cultural heritage, [5] the issue of sustainable development can be understood in two ways:

- Intrinsic; as a concern for sustaining the heritage, considered as an end in itself, and part of the

environmental/cultural resources that should be protected and transmitted to future generations to guarantee their development.

- Instrumental; As the possible contribution that heritage and heritage conservation can make to the environmental, social and economic dimensions of sustainable development
- The first approach rests on the assumption that cultural heritage and the ability to understand the past through its material remains, as attributes of cultural diversity, play a fundamental role in fostering strong communities, supporting the physical and spiritual well-being of individuals and promoting mutual understanding and peace. According to this perspective, protecting and promoting cultural heritage would be, in terms of its contribution to society, a legitimate goal per se.
- The second approach stems from the realization that the heritage sector, as an important player within the broader social arena and as an element of a larger system of mutually interdependent components, should accept its share of responsibility with respect to the global challenge of sustainability. In the current context of mounting pressure from human activities, reduced financial and environmental resources and climate change, the contribution of heritage protection to sustainability and sustainable development could no longer be taken for granted, but should be demonstrated on a case-by-case basis through each of the three 'pillars'; the social, the economic and the environmental dimensions.

B. Principles of Urban Regeneration

When regeneration is considered in the context of urban, it involves the rebirth or renewal of urban areas and settlements. Urban regeneration is primarily concerned with regenerating cities and early/inner ring suburbs facing periods of decline due to compounding and intersecting pressures. In the context of urban heritage, [6] regeneration concept is the comprehensive definition for the conservation, restoration, and preservation practices, which based on some basic principles:

- Coordination between various sectors.
- Creating a holistic vision.
- Regenerating people rather than a place.
- Creating partnerships across all levels of government.
- Building public sector capacity and leadership.
- Engaging the local community in the planning process.

IV. KOM EL-DEKKA HISTORIC PATH

A. Identifying the Path

Kom El-Dekka is considered to be one of the oldest five districts of Alexandria. History of the area dates back to the Ptolemaic period, and it used to have a historic importance over eras. Kom El-Dekka is located on a hill and reaches at its highest level to 26 meters above sea level, which distinguished the district and added a unique urban quality. This gained value resulted from accumulations of many urban layers over years.

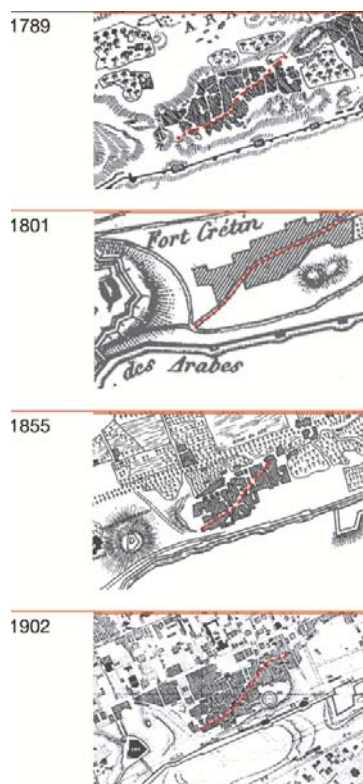


Fig. 2 Kom El-Dekka Historic Path analysis over historic maps

Based on historic maps of Alexandria drawn by Charles Muller and others, morphological analysis has been performed for the study zone and Kom El Dekka appeared as an essential zone on these maps. When overlaying these maps Fig. 2, it becomes so clear that Kom El Dekka Historic Path is the major spine and the most authentic path over time. This analysis shows how the path penetrates Kom El Dekka and forming the urban pattern.

There is no doubt that the urban pattern evolved through the years, but the path remained without facing radical changes, and still the most important open space in the district.

B. Problems of Kom El Dekka Historic Path

Kom El-Dekka historic path and the district overall used to be neglected for many years. The lack of maintenance and negligence caused many problems; some of these problems could be mentioned as the following:

1. Deterioration of the Streets' Urban Fabric

Layers and layers of inappropriate interventions have flooded the distinctive historic urban fabric, and led to a distorted image for a unique place Fig. 3. This deformed image combines historic buildings, deteriorated buildings, and informal residential towers. Due to the radical changes of the urban ideologies, deterioration of the urban fabric was reflected on the streets' identity and social character.

2. Absence of Organized Maintenance and Restoration Practices

Absence of organized maintenance and restoration practices for old buildings led to the deterioration of Kom El-Dekka

Historic Path architectural character. Some maintenance practices have been performed by the residents, but most of these practices are not considering the historic value of the buildings.

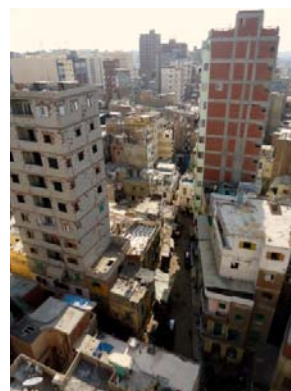


Fig. 3 Inappropriate interventions in Kom El Dekka Historic Path

3. Neglecting Historic Building with Heritage Value

Most of historic buildings along the street had been destroyed or on their way to be. Some of these buildings are not even noticeable for the street visitors or passers. Even worse, some of them turned to be an abandon place that hosts homeless and criminals. In some cases, historic buildings turn to be an animal shed, like the house of Sayied Darwish Fig. 4, that almost demolished and only its ruins remain.



Fig. 4 Ruins of Sayied Darwish historic building

4. The Non-Contextual Interventions in the Path

Random constructions are interrupting the path river, blocking the historic buildings elevations, and disturbing the order of the historic streets alignments, Fig. 5.



Fig. 5 Random constructions in Sayied Darwish Street

5. Noticeable Violations for the Building Regulations

High rise residential buildings with unsuitable designs and color scheme are distorting the street skyline, ruining the proportions, and affecting the historic path's value. These buildings are violating the district's building regulations, Fig. 6.



Fig. 6 High rise residential building in Sayied Darwish Street

6. Lost Urban Spaces along the Path

Lost urban spaces could be noticed along Kom El-Dekka Historic Path, leaving those spaces underused led to urban misusing activities, like using lost urban spaces as storage spaces for street vendors stuff, or even using those spaces as animal sheds. That phenomenon not only happens in the vacant plots, but also on the main path river.

7. Absence of the Public Awareness of the Streets' Residence

As a result of the radical social changes that took place in the streets of Kom El Dekka, the Historic Path ideology turned to be very complex, and the social fabric became incoherent. Certainly, that had a bad effect on the residents' awareness of the historic value of the place they are living in, and these values became out of their priorities. The street residents are not the only responsible of this problem, the government and the local organizations are responsible too of the public awareness for the local community of the street.

V. COMPREHENSIVE ANALYSES OF KOM EL-DEKKA HISTORIC PATH

A. Typology and Configuration

The path consists of two main streets, Said Darwish Street and Sedy Mehrez Street, besides some distinctive side alleys branching from them. Along the path there are 3 main nodes, 3 semi-nodes, and 16 junctions 5 of them are intersections, Fig. 7.

B. Spatial Analysis for Kom El Dekka Historic Path [Syntactical Analysis]

Spatial analysis for the path using Space Syntax software [7] enables to perform traditional syntactical analysis, called the primal analysis, which consists in describing a spatial configuration as a set of axial lines and working out their relative proximities, like connectivity, integration, and depth map.

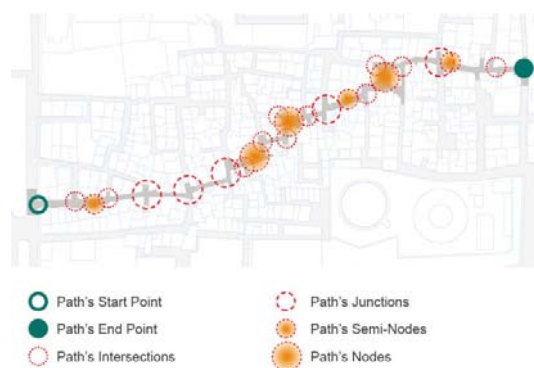


Fig. 7 Configuration analysis for Kom El Dekka Historic Path

TABLE I
COMPREHENSIVE ANALYSIS FOR KOM EL DEKKA HISTORIC PATH

General layout	
- Length	514 m
- Average width	6.4 m
- Access of vehicles	Accessible for vehicles
- Sense of direction	Random vehicles in and out movement
- Number of lanes	One / two lanes in some wide spaces
- Presence of formal parking	Some non-formal parking spaces
- Presence of widening	The path has irregular widths and non-formal configuration (Traditional compact urban fabric). At some spaces, these widening form nodes or plazas.
- Walkability	As a part of a traditional fabric, the path with its remarkable streets and nodes is considered to be a very interesting urban space to walk in, with easy and smooth stoops and many focal points.
- Presence of sidewalks	Rare presence of sidewalks (only in the areas with new alignments)
- Walkability of the sidewalks	It is much easier and more interesting to walk on the river of the path than to walk on a narrow sidewalk
- Presence of safe crossing	Most of the path are very safe for crossing.
Open space	
- Presence of trees	Some trees near old buildings and ruins, also near coffee shops.
- Presence of green areas	Rare
- Presence of garbage collecting points	Non-formal garbage collecting points would be found.
- Presence of public lighting	Not enough lighting units.
- Presence of steps	In some alleys around the main path.
- Presence of Paving	Paved sidewalks and asphalt for the path river
- Presence of coverage	Non-formal coverage in some spaces by the inhabitants.

a) Connectivity Syntactical Analysis

Syntactical Axial Map, Fig. 8, shows the connectivity value of the Kom El-Dekka streets and open spaces, represented in a color range which varies from red as the highest connectivity value to the blue as the least value.

Conclusion: Kom El-Dekka Historic Path has intermediate connectivity value which is getting lower in the middle of the path and Sayied Darwish Coffee Shop Node, and is getting higher along the first part of Sayied Darwish Street and Sidi Mehriz Street.

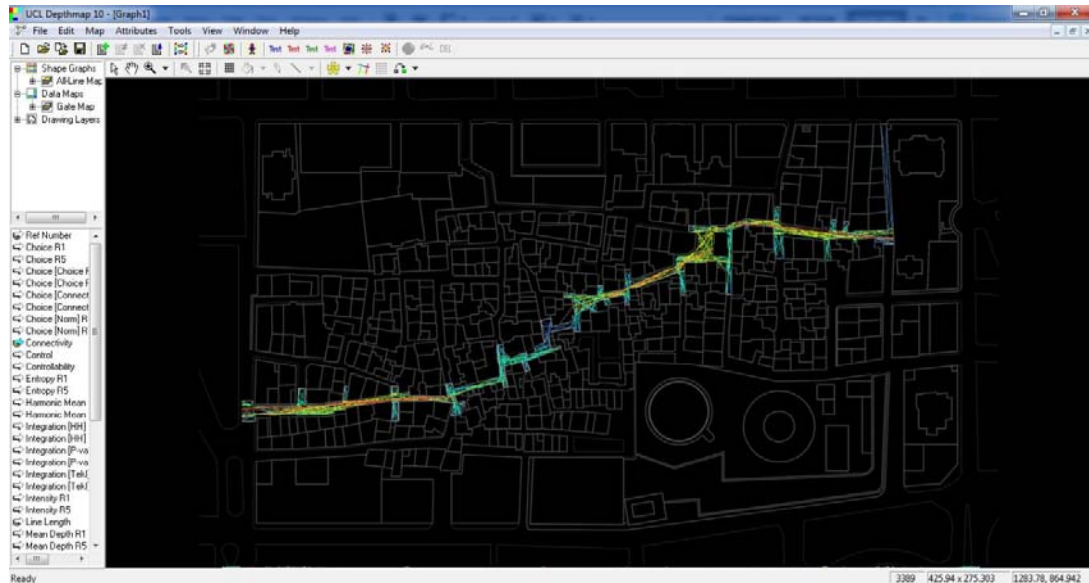


Fig. 8 Connectivity syntactical analysis for Kom El Dekka Historic Path

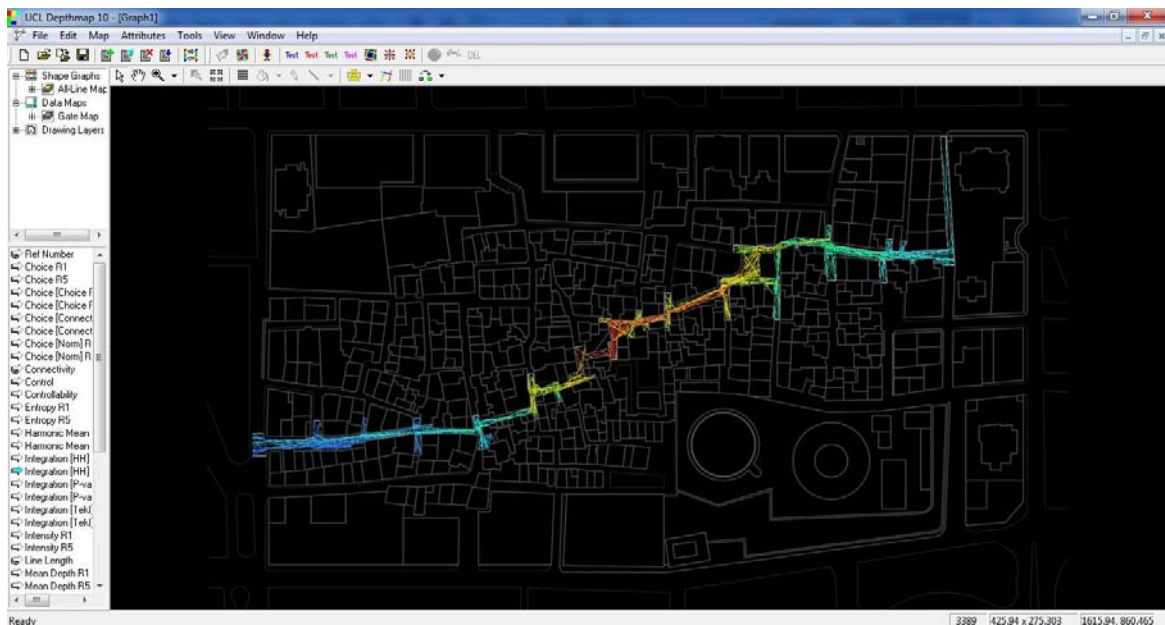


Fig. 9 Integration syntactical analysis for Kom El Dekka Historic Path

b) Integration Syntactical Analysis

Syntactical Axial Map, Fig. 9, shows the integration value of the Kom El-Dekka streets and open spaces, represented in a color range which varies from red as the highest integration value to the blue as the least value.

Conclusion: Kom El-Dekka Historic Path has high integration value (based on the compact urban fabric of the district), which is getting lower along the straight streets like the beginning of Sayied Darwish Street and Sidi Mehriz Street, and is getting higher in the nodes.

c) Depth Map Analysis

Depth Map is explaining the hierarchy of the streets according to the ratio between the length and the width of each

street, represented in a color range which varies from red as the highest depth value to the blue as the least value, Fig. 10.

Conclusion: Kom El Dekka Historic Path has intermediate depth value which is getting higher in the beginning of Sayied Darwish Street, and is getting lower in the nodes and the short parts of the path.

d) Isovist Analysis

Isovist is the field of view, available from a specific vantage point; a horizontal slice through this field of view is then calculated, usually taken at eye height and parallel to the ground plane. As an application of this concept on Kom El-Dekka Historic Path, Isovist Analysis has been performed

along the path in the main nodes and junctions, to show the compactness of the path's open spaces, Figs. 11 and 12.

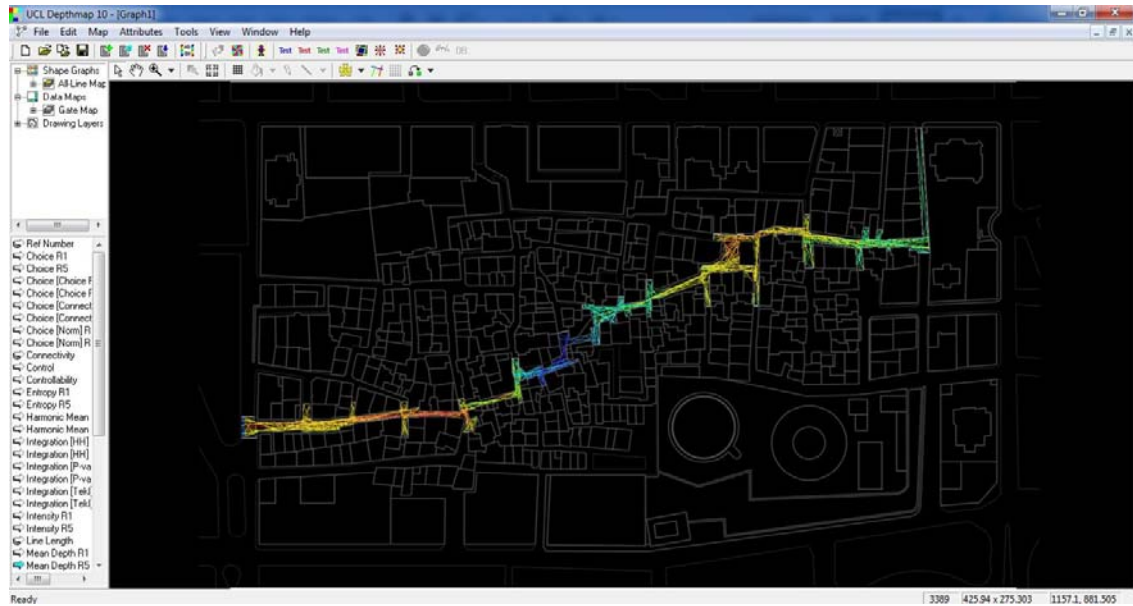


Fig. 10 Depth map analysis for Kom El Dekka Historic Path

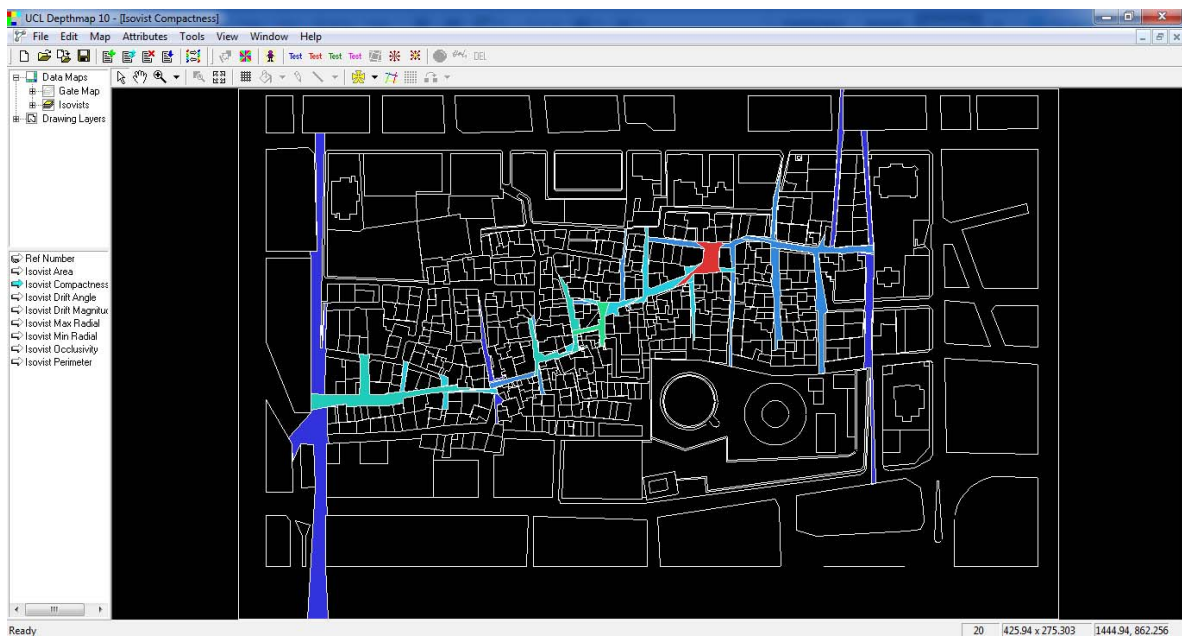


Fig. 11 Isovist analysis for Kom El Dekka Historic Path

Isovist Map shows the compactness value along the path, represented in a color range which varies from red as the highest compactness value to the blue as the least value.

Conclusion: Kom El-Dekka Historic Path has high compactness value which is getting lower along the open streets such as the beginning of Sayied Darwish Street, and is getting higher in the main nodes.

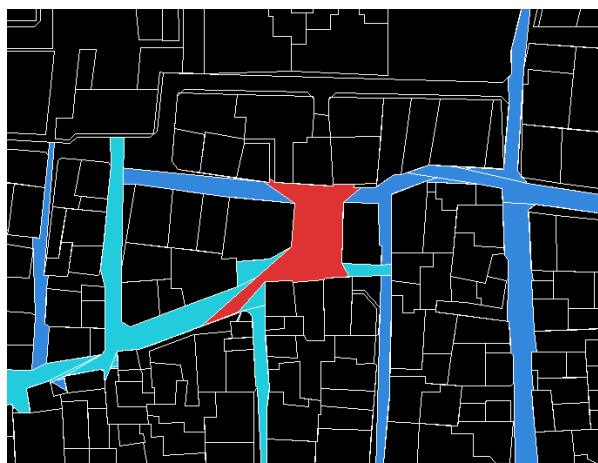


Fig. 12 Isovist analysis for Kom El Dekka Node

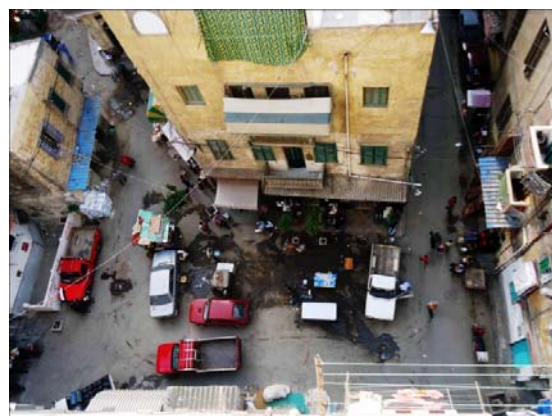


Fig. 13 Top view for Sayied Darwish coffee shop node, Kom El-Dekka

C. Activity Patterns Analysis for Kom El-Dekka Historic path [Sayied Darwish Coffee Shop Node as an Example]

Sayied Darwish Coffee Shop Node, Fig. 13, is considered to be the most important urban space along the path for the following reasons:

- Sayied Darwish Coffee Shop is one of the most authentic places not only in Kom El Dekka but in Alexandria. It has a historic significance cultural wise and considered to be a part of the old Alexandria city image.
- The node is very vital and full of different activities which reflect the cultural pattern of the street.
- Physically, the node is in a very critical space which connect the two main streets of the path, Sayied Darwish Street and Sidy Mehrez Street.

To identify the activity patterns that characterize non-residential uses in historic streets and open spaces (commercial, handicraft, services, production and wholesale, local markets, religious and cultural activities and events ...). [8] These activity patterns involve the local communities in one way or another; either as clients or as providers of the activity, or as principal actors defining the activity pattern and how it is performed based on their lifestyle and shared socio-cultural norms. For that reason, these activity patterns are regarded as “community-oriented” activity patterns.

Tables II-V represent a part of the activity pattern analysis of the node, in order to achieve community oriented activity patterns.

TABLE II
ACTIVITY SETTING ANALYSIS

Fixed feature elements	Semi-fixed feature elements	Non-fixed feature elements
Sayied Darwish coffee shop. Some old shops in the old buildings. Some new shops and stores in the new central residential building (grocery, poultry shop, and cloths store) A small oratory in a new building.	Small trees are planted in front of the coffee shop. Non formal outdoor storage places, used usually to store building materials and equipment. Some semi fixed kiosks belong to street vendors.	

TABLE III
RELATION TO SURROUNDINGS

Connectivity	Needs and potentials	Historic value components
Sayied Darwish coffee shop node is a semi-enclosed space with a high compactness value (based on the special analysis), it connects the two main streets of the path; Sayied Darwish Street and Sedi Mehriz Street and accessible from the two streets. Those spatial circumstances create a big potential of movement.	For the node’s actors, the node is considered to be a very active space. Most of their needs are related to commercial activities such as spaces for selling and buying goods, besides some other recreational needs and provision of parking spaces.	The node itself has historic urban value, and the existence of Sayied Darwish coffee shop raises this value.

TABLE IV
MODALITY OF APPROPRIATION OF PUBLIC SPACE

Right of Way (RoW)	The right to pass through the node is violated by the street vendors and people sitting in the coffee shop buffer zone.
Affordances / Anchors	Buildings' exterior walls, the coffee shop pavement, and some artificial anchors created by the vendors.
Need (from the surrounding area)	In addition to the need to pass through the node, the need to use the node as a commercial recreational area became essential.
Rules (who? Controls what?)	Street’s vendors and the coffee shop’s workers dominate the space
RoW configuration	Adjacent / through
Type of the space	Reservoir

TABLE V
 USABILITY OF THE SPACE

# of Passersby			Range of Users				Type of Users			
None	Small	Large	Local	Within District	Several Districts	City+	Residents	Workers	Clients	
		•	•	•			•	•	•	

D. The Economic Value of Kom El Dekka Historic Path

Kom El Dekka Historic Path has a distinctive historic value and social activities that reflect many potentials for the economic investment. The economic value of the path could be represented in two points; tourism development and boosting the local economic activities and managing them.

1. Sayied Darwish Musical Festival

Sayed Darwish was an Egyptian singer and composer who was considered the father of Egyptian popular music and one of Egypt's greatest musicians and its single greatest composer. Every year, the path turns into a carnival of art, songs and music of Sayed Darwish is played in the streets by local contemporary musicians celebrating his birthday on March 17.



Fig. 14 Sayied Darwish music festival in Kom El Dekka

The festival consists of a number of events, including musical evenings, art shows and documentaries inspired by the life and work of Sayed Darwish. People come from all over Alexandria to enjoy the art and the mood of Kom El Dekka. The festival is creating a great opportunity for the path local community to express their culture and art, Fig. 14.

2. Mapping Economic Value of the Path

As mentioned, the path carries a very unique economic value, in order to understand and realize this value, an analysis for economic value has been made to illustrate it, based on exploring the economic potentials along the path and use them as indicators for economic value. The mapping process emphasizes the spatial distribution of economic values of Kom El Dekka Historic Path related to heritage.



Fig. 15 Mapping the economic value of Kom El Dekka Historic Path

In order to provide a comprehensive view of the economic values of the path heritage, a multi-layered map laid over the economic potential spatial points to create an economic value topology map, Figs. 15 and 16, showing the liner configuration of the economic value.

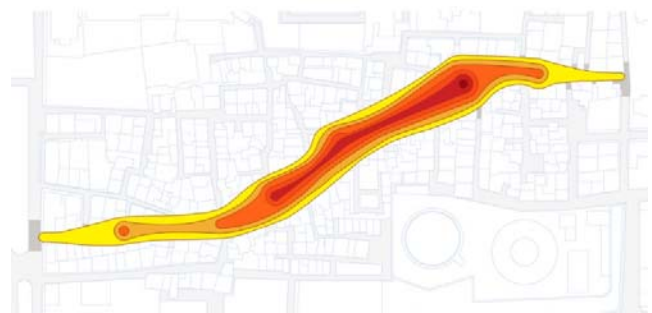


Fig. 16 Mapping the economic value of Kom El Dekka Historic Path

E. Heritage Value Assessment of Kom El Dekka Historic Path

Heritage value assessment has been done based on 5 criteria:

- Architectural/Urban authenticity.
- Presence of historic streets' alignment.
- Presence of traditional land sub-division patterns.
- Continuity and compactness of the built-up fabric.
- Activities and uses of the urban space.

1. Architectural/Urban authenticity

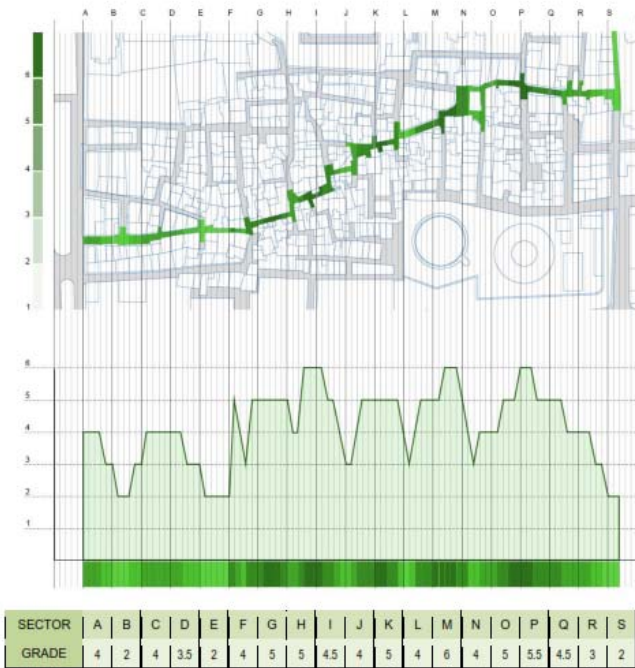


Fig. 17 The architectural/urban authenticity of Kom El Dekka Historic Path using a grading scale from 1 to 6

2. Presence of Historic Streets' Alignment

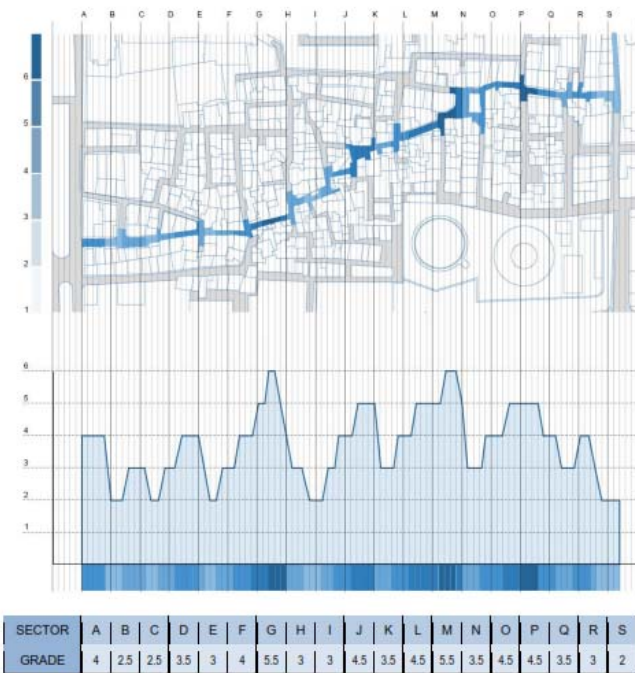


Fig. 18 The presence of historic streets alignment in Kom El Dekka Historic Path using a grading scale from 1 to 6

3. Presence of Traditional Land Sub-Division Patterns

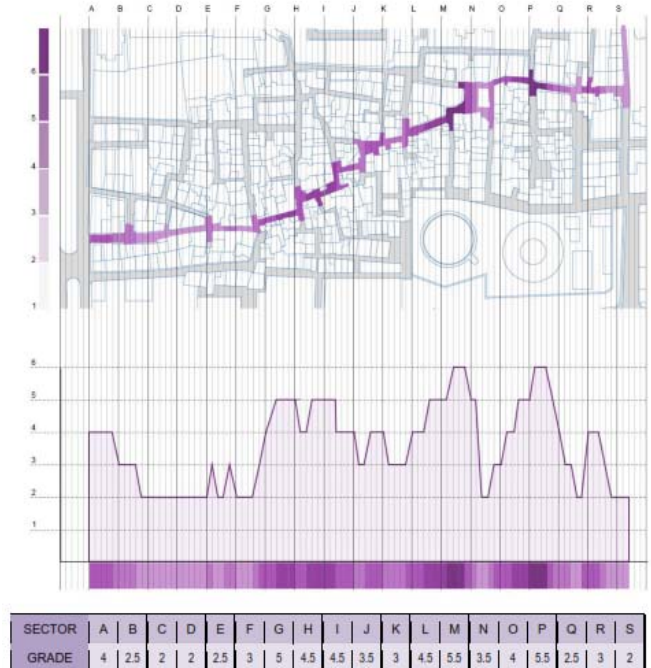


Fig. 19 The presence of traditional land sub-division patterns in Kom El Dekka Historic Path using a grading scale from 1 to 6

4. Continuity and Compactness of the Built-Up Fabric

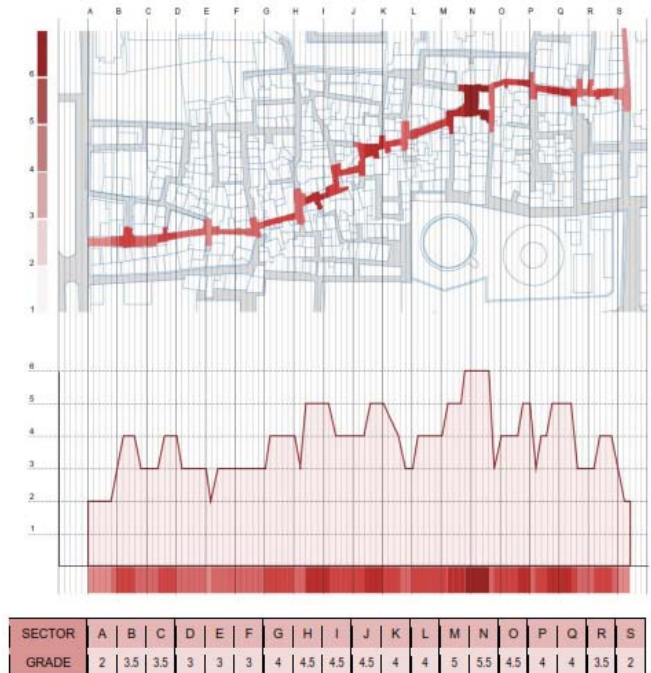


Fig. 20 The continuity and compactness of the built-up fabric in Kom El Dekka Historic Path using a grading scale from 1 to 6

5. Activities and Uses of the Urban Space

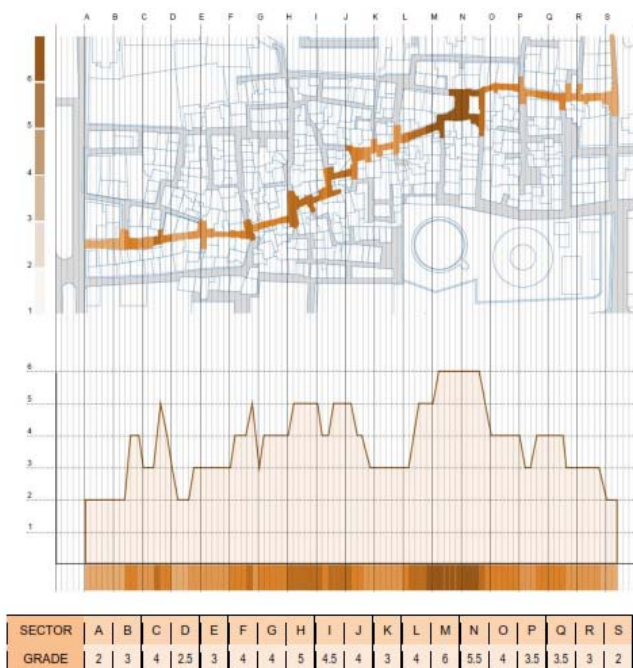


Fig. 21 The activities and uses of the urban space in Kom El Dekka Historic Path using a grading scale from 1 to 6

6. Overall Assessment of Kom El-Dekka Historic Path

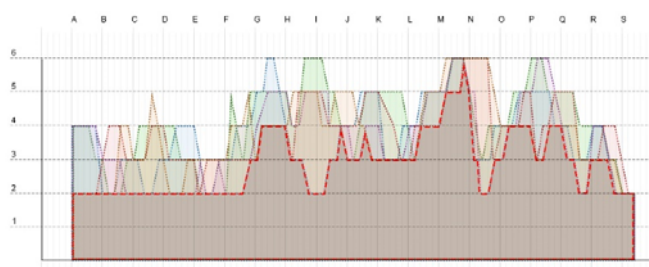


Fig. 22 Overall assessment for the heritage value of Kom El Dekka Historic Path using a grading scale from 1 to 6

VI. CONCLUSION

These are some resulted facts of the study that highlight the need to start solving the problems of the path and take action in a serious regeneration plan:

- Kom El Dekka historic path is considered to be the most authentic urban space in the district and have a lot of values that need to be preserved.
- The path is facing serious problems that should be halted and fixed.
- Comprehensive analysis and syntactical analysis of the path are giving valid indicators for the regeneration practices.
- Analysis of activity patterns of the path shows that Sayied Darwish coffee shop node is the most social active space along the path.
- Street's festivals like Sayied Darwish festival supports the value and the identity of Kom El Dekka historic path.

- Economic analysis and mapping show that the path has liner economic potentials.
- Heritage value assessment proves that the path has a distinctive heritage value besides its urban value.

VII. RECOMMENDATIONS

Underpinning the policies of the Regeneration Plan is a number of recommendations:

- To improve a wider public's awareness and appreciation of the cultural significance of Kom El-Dekka Historic Path.
- To ensure that the buildings is maintained to the appropriate standards and the structural elements are not at risk.
- To ensure proper and sufficient technical guidance and architectural historical information is available to both property owners and planning officials so that the appropriate standards for any building or maintenance works are implemented and to prevent inadvertent loss or damage to important building fabric, structure, historic layout and context.
- Activating adaptive reuse concept for lost and abandoned buildings and spaces along the path.
- To protect against inappropriate uses of interventions and alterations to the buildings on Kom El-Dekka Historic Path and their historic context.
- To consolidate and improve the presentation of the street and the public realm environment.
- To protect and consolidate the street's historic importance and its unique urban character in terms of its immediate surroundings and the broader city context.
- To include the path in the urban heritage preservation plan of the city of Alexandria.
- Supporting the tourism development of the path and include Kom El-Dekka historic path in the national tourism campaigns.
- Focusing on events and festivals as a tool for social and economic revitalization.
- Supporting the local commercial activities and encouraging the small project.
- Provision of funding resources for the regeneration practices with suitable contribution systems.

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REFERENCES

- [1] Lynch, K. *The Image of the City*, MIT Press, Cambridge, Mass, pp. 49. 1960
- [2] Spreiregen, Paul D. *Urban Design: The Architecture of Towns and Cities*, AIA, McGraw-Hill Book Company, London. 1965
- [3] Marshall, S. *Streets and patterns*, UK: Spon Press, pp. 53, 84. 2005
- [4] Moughtin, C. *Urban Design Street and Square*, 3rd edition, Oxford: Architectural Press, pp. 127,128. 2003
- [5] UNESCO. *Managing Cultural World Heritage*, Paris, France: UNESCO, pp. 20. November, 2013
- [6] Virginia Tech – Metropolitan Institute, viewed 18 November 2015 find

- at: mi.vt.edu/research/urban-regeneration/
- [7] The Bartlett, UCL Faculty of the Built Environment, Space Syntax Laboratory, viewed 11 November 2015, find at: bartlett.ucl.ac.uk/space-syntax
- [8] Shehayeb, D. *Community-Oriented activity Patterns*, Urban Regeneration Project for Historic Cairo – URHC, Egypt: URHC. 2012