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THE AMERICAN UNIVERSITY IN CAIRO

الجامعة الأمريكية بالقاهرة

Graduate Studies

**Creating a Development Framework: a Generic Lens for
Public Markets' Analysis and Development in Integration
With Their Zone of Influence Revitalization**

A Thesis Submitted by

Nourhan Khaled Ahmed

to the Sustainable Development Graduate Program

March 27, 2022

**In partial fulfillment of the requirements for the degree of
Master of Science in Sustainable Development**

Under the supervision of

Dr. Basil Kamel, Professor of Architecture and Urban Theory, Chairman

Department of Architecture

The American University in Cairo

Egypt, 2022

“The Markets of Cairo help to make Cairo as much as Cairo makes them, and in an attempt to rejuvenate our city, our efforts are spanned to cover public markets with their stimulated dynamism”.

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Dedication

I sincerely dedicate this thesis to all of my family for their unconditional love and support in each and every step. Their motivation was quite an empowerment that kept me going despite the hard times. I also dedicate this thesis to my beloveds who have passed away, who once wished to see me pursuing my graduate academic study and passing knowledge to the coming generations.

I can never forget to dedicate this thesis to those working in the Egyptian public markets who struggle every day in the marketplace, those who have hope in Allah Jalla Jalaluh, in us, in tomorrow, and in themselves to see the market flourish once again.

Abstract

This thesis discusses how the development of public markets through a structured framework can be a catalyst for revitalizing its zone of influence¹. Public markets have always been marked by their rich experience, and their central role in towns, cities, and villages, as they have been vital engines for urban growth and cities formation since their prevalence. Needless to mention their role in entrepreneurship and their significance for the social development of neighborhoods. Nowadays, local governments are rediscovering the central role of public markets and are putting them under focus to catalyze the urban growth and neighborhoods revitalization by their development. This role entails regenerating public spaces, developing buildings, and fostering healthy social interactions and local economic structures. Despite this interest, there has been limited scholarly attention given to the notion that developing public markets can be a tool to physically transform its surrounding zone of influence inside the city. Hence, this thesis contributes to filling in the gap by studying the realm of public markets and generating a development framework that can be used for analyzing and developing any market in integration with its zone of influence revitalization.

This thesis used both secondary and primary research methods to study the active role of public markets in relation to their zone of influence and the different systems, functions, and components of public markets. It also used secondary research methods to study the different theories and approaches that can be used for analyzing and dissecting the public markets into their basic units and their relationships. By using the above methodology, the thesis created a development framework that can be used for analyzing any market and developing it in integration with its zone of influence revitalization. Then, it applied the development framework on a case study, Souq Al-Tunsi. The findings of this application revealed that the core problems that affect its functionality are: informality, lack of management, poor education, and having an informal culture. As part of developing the market in integration with its zone of influence revitalization, the thesis proposed guidelines such as: formalizing the market and its surrounding area, enhancing the education and culture, creating a market management body, and upgrading the market's services, urban fabric, and built-up form in correspondence with its context. Applying these guidelines leads to a better selling process, efficient supply chain of goods, renovating historic monuments in the area of the market, provision of quality infrastructure and urban fabric systems, reviving landmarks, and creating active public spaces. Applying these guidelines also leads to increase the diversity, safety, and attractiveness of the market and its surrounding area, leading to an increase in the number of customers, the profitability of the market, and the upgrade of the whole area.

¹ The zone of influence of the market is the area affected by the market's performance and functioning systems, it can be the surrounding neighborhoods and communities in mega cities and large portions of the city in mini cities, and whole towns in town villages. It can include planned/unplanned, formal/informal areas.

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Nomenclature

- **ANT:** The Actor-Network theory.
- **EGP:** Egyptian Pounds.
- **GHG:** Green House Gas Emissions, mainly CO₂.
- **HCWW:** Holding Company for Water and Wastewater.
- **Khan:** Type of inn that functions as a trading center and a hostel, found in the Middle East and parts of North Africa and Central Asia.
- **Masjid:** An Islamic worshipping place synonym to Mosque.
- **Non-SMTT Systems:** The non (specific, measurable, tangible, and timely) systems.
- **NOUH:** National Organization of Urban Harmony.
- **Qahwa:** A local coffee shop.
- **Qaysariyya:** A type of caravanserai that lodges craftsmen on its upper floors and houses their goods on the ground floor around a Sahn, a central open area.
- **SDGs:** The sustainable development goals.
- **SMTT Systems:** The specific, measurable, tangible, and timely systems.
- **Souq:** Market and its plural is Souqs.
- **UDF:** The Urban Development Facility formerly known as the *ISDF*.

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Chapter 1: Introduction

1.1. Public Markets as the Heart, Soul, and Motor of Cities

For millennia, public markets have existed as important centers for cities, villages, and towns; they have been crucial engines for urban regeneration. As illustrated in figure (1), Public markets have a long history of being a major attraction in the centers of towns and cities, where lots of towns are known, up till now, as *market towns*, as they are places for central exchange activities and public spaces². Markets are not only major focal points in cities and towns, but they have also been driving forces for cities' formation. As the main constituent in markets, food retailing has been playing a major role in organizing the city to become more compact and livable, by strengthening “the relations of proximity and the sense of community”.³



Figure 1- Inside Boqueria Market, Barcelona 1918-1922 (Costa et al., 2015)

Although an engine for community life, public markets have witnessed a noticeable decline after the “rise of the wholesale system” and the development of the chain stores in the twentieth century⁴. However, markets did not disappear from the urban landscape, where they

² Caramaschi, S. (2014). Public markets: Rediscovering the centrality of markets in cities and their relevance to urban sustainable development. *WIT Transactions on Ecology and the Environment*, 191, 2. Retrieved from: https://www.researchgate.net/publication/271417630_Public_markets_Rediscovering_the_centrality_of_market_s_in_cities_and_their_relevance_to_urban_sustainable_development/citation/download

³ Ibid, p.3.

⁴ Ibid.

succeeded in “recovering their traditional character of being an urban fact that has a completely different experience from the generic and controlled environment of the hyper places”⁵. This distinguished experience as well as the centrality of the public markets inside the cities were the main drivers for the markets’ existence up to this moment.⁶

1.2. Background and Significance of Research

Public markets offer many experiences that are richer and more authentic than other formats, where it is a medium of interactions, proximity, and diversity⁷. Markets bring diverse people of different genders, ethnicities, races, socioeconomic status, and ages together “around the experiences of food, shopping, and conversation”, thus, they play a distinguished role in the urban fabric, as they are “the most socially diverse public places in a community”⁸.



Figure 2- Mercat de Mercats, Barcelona, Institut Municipal de Mercats de Barcelona (Costa et al., 2015)

Besides, the nature of the buying and selling process, in the atmosphere that public markets provide as illustrated in figures (2) and (3), generates a high level of socialization that is not found at a regular supermarket. That turns public markets from a regular space of buying and selling into “an engine for community life”.⁹

⁵ Caramaschi, (2014), Public markets, p.3.

⁶ Ibid.

⁷ Ibid.

⁸ Pannozzo, F., (2013). Policy paper on the role of urban markets for local development and urban regeneration. *Central Markets Project*, p.9. Retrieved from:

http://www.centralmarkets.eu/files/Study_on_the_role_of_urban_markets.pdf

⁹ Ibid.



Figure 3- St John Market in the Old Town, City of Wrocław, Poland (Costa et al., 2015)

1.2.1. The centrality of public markets

Markets have also been characterized by their centrality in cities, towns, and villages, becoming the heart of city life. The centrality of the Market is not only attributed to the location of the markets inside the city, but also to the wide range of benefits that public markets offer to the various segments. These benefits, as illustrated in below figure (5), are summarized in the following:

1. First, public markets can revitalize urban centers, when properly managed, by linking them to the rural world, thus, leading to a short supply chain of quality food and other local domestic products. This efficient short supply chain promotes the urban-rural network and integrates communities into cities.¹⁰
2. Second, public markets facilitate socio-economic cohesion and foster the economic development of the community by creating local employment opportunities and providing better collective marketing techniques.¹¹

¹⁰ Caramaschi, (2014), Public markets.

¹¹ Ibid.

3. Third, as shown in figure (4), public markets create quality urban life, where they support healthy social relations, develop a sense of community, “increase safety in the streets, attract tourists, enhance property values and inspire people in their daily life”.¹²
4. Fourth, public markets have lower CO₂ emissions as they “facilitate non-motorized forms of transport, like cycling or walking”¹³. When properly planned, urban markets become a hub of a sustainable system of mobility for customers and vendors integrating public transport to facilitate the entry to markets without private cars usage¹⁴.



Figure 4-St John Market in the Old Town, City of Wrocław, Poland (Costa et al., 2015)

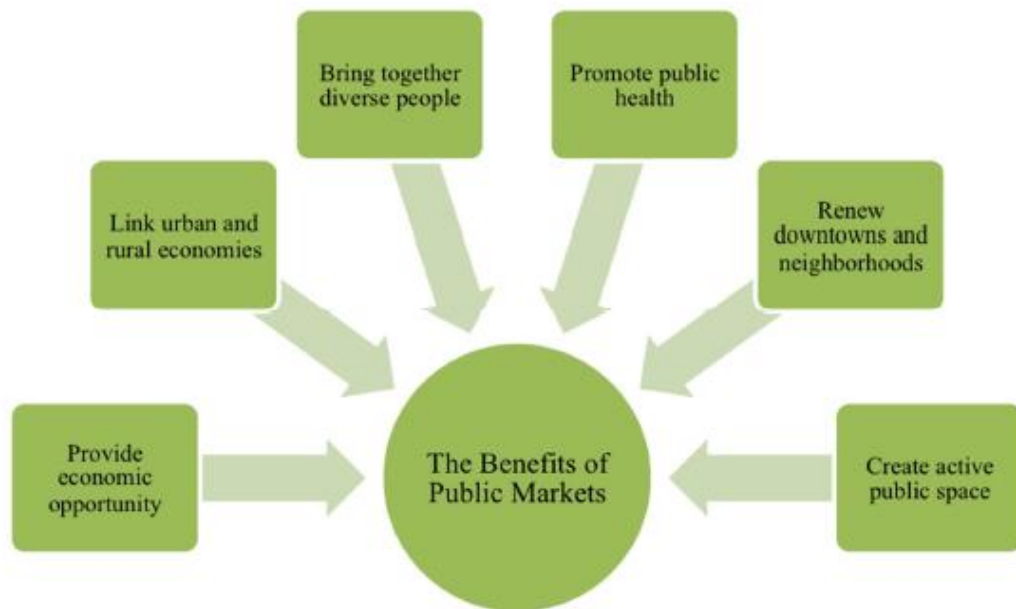


Figure 5-The Benefits of Public Markets (Caramaschi, 2014)

¹² Caramaschi, (2014), Public markets, p.8.

¹³ Ibid, p.10

¹⁴ Ibid.



Figure 6- A Market Stall in Barcelona (Costa et al., 2015)

“Historically, markets, the heart of the cities, have been fundamental for growth, exchange, and supply”¹⁵

1.2.2. Significance of research

Nowadays, local governments are rediscovering the central role of public markets in the city in terms of their significance to the sustainable urban development, their role in entrepreneurship, jobs creation, and their significance for the social development of neighborhoods. Thus, public markets are now under focus to lead a crucial role in urban growth and their zone of influence revitalization. This role entails regenerating public spaces, developing buildings, and fostering healthy social interactions and local economic structures. Most importantly, this role can be fully realized with the market development.¹⁶ This thesis attempts to highlight how this role can be achieved through developing public markets in a structured manner.

¹⁵ Costa et al., (2015), Urban markets, p.8.

¹⁶ Ibid.

1.2.3. City and neighborhood revitalization through the development of markets

The market development, as noted from literature and applied cases, can stimulate the dynamism of neighborhoods inside the city. If taken into consideration as part of a city planning policies and strategies, “the market can be a mean to physically transform a city and its neighborhoods” especially to underprivileged neighborhoods¹⁷. Rebuilding and remodeling strategies for the public markets can enhance the urban landscape of our cities. Since the market in essence is a series of built and/or open-air spaces that host interaction between various stakeholders in the neighborhood, therefore the public market can influence its surrounding context by changing the flow and pattern of people, goods, and traffic, and it can bring within its ties “an essential set of annexed services”¹⁸. Developing the markets—when considered



Figure 7-The Market's Ecosystem (Caramaschi, 2014)

within the policies of the city's urban planning—can lead to the creation of public goods: “they could be an answer to the need of generation of public spaces and quality life, preserving historic heritage or even creating new poles of tourism attraction and designing new iconic elements in the city”¹⁹. For that to be fully attained, an integrated “strategy of action and coordination is required among the various public and private stakeholders” found in the market ecosystem, as illustrated in the above figure (7)²⁰. Furthermore, the market remodeling process is a good chance to “rethink and upgrade the services and urban planning of the neighborhood through an integrated action plan: it may involve green areas, establishing links with the district's commercial axis, and pedestrianization of streets”²¹. All in all, “markets can bring new dynamism”, especially to underprivileged neighborhoods²².

¹⁷ Costa et al., (2015), Urban markets, p.49.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

1.2.4. An example of space regeneration using market revitalization: The Old Market Square, Wrocław:

An Example of revitalizing the neighborhoods inside the city through developing the markets can be found in the case of “The Old Market Square in Nowy Targ in the town of Wrocław”²³. This market historically was one of the three major public markets in the town of Wrocław. Over time, the square that hosts the market has been transformed by modern mono-functional buildings that ended in the square being unattractive and empty, only filled with parking places, the place started to lose its original function and identity. The market and the whole space had to develop in order to gain back its commercial and social function as a gathering space for citizens. As illustrated in figure (8), the development of the market included moving the car park underground and restricting the cars’ access to the square corners as well as creating newly designed walls around the paved space. Recreational areas were designed in the north and south frontage and commercial activities were revived with a multifunctional pavilion in the south and north poles of the square. Retail stores returned to offer fresh produce back again in the commercial zone. Briefly, the regeneration and development of The Old Market Square have led to “a new modern leisure square with a commercial function and a new architecture, an inviting place to relax”.²⁴



Figure 8- Street Market in Wrocław (Costa et al., 2015)

²³ Costa et al., (2015), Urban markets, p.48.

²⁴ Ibid.

1.2.5. An example of space regeneration using market restoration: The Ancient Souq of Aleppo, Al-Saqatiyya

Another Example of regenerating the city through market restoration can be found in the case of the restoration of the Ancient Aleppo Souq, Al-Saqatiyya. This market lies in the historic commercial center of Aleppo city. Aleppo was a popular commercial city whose Souqs were the biggest historical markets in the world. Souqs in Aleppo, in the early twentieth century, covered an area of 12 km and 16 ha reaching 119 markets. Souq Al-Saqatiyya, among the various markets in Aleppo, was the social, economic, and cultural center of the city. It was considered an

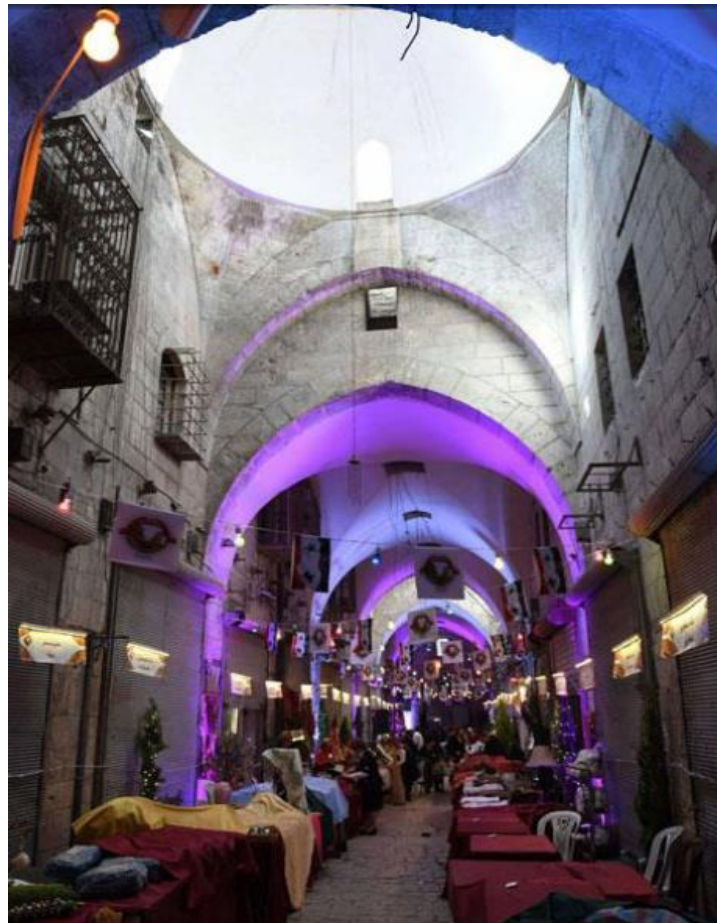


Figure 9- Aleppo Shopping Festival in Souq Al-Saqatiyya (Yaghi, 2017)

interactive hub of assembly, discussion, and social interaction for the Aleppians as illustrated in figure (9). The Souk had a length of 113 m, a wide corridor of 4.7-4.9 m, and 53 shops of different specialties on its sides. The storefronts of the shops made a continuous strip of semicircular arches and groined vaults that occupied the entire facade of the street as shown below in figure (10). The Souq sold grains, spices meats, food, pistachios, vegetables, and it encompassed restaurants.²⁵ In 2012, the Syrian civil war started, and the city was harshly damaged along with its commercial center. Souq Al-Saqatiyya was severely impacted by the war to the extent that 34 out of 53 shops were destroyed as shown in the below figure (11).²⁶

²⁵ Ibrahim, S. (2020). Decision-making methodology between revitalization and rehabilitation of world heritage city centers, case study: The ancient city of Aleppo (Syria). *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol. XLIV-M-1-2020, 2020. Retrieved from: <https://www.researchgate.net/publication/343203020>

²⁶ Yaghi, A. (2017). Restoration protocol in conflict zones, practical insights from the old city of Aleppo. *Cologne Institute of Conservation Science*. Retrieved from:

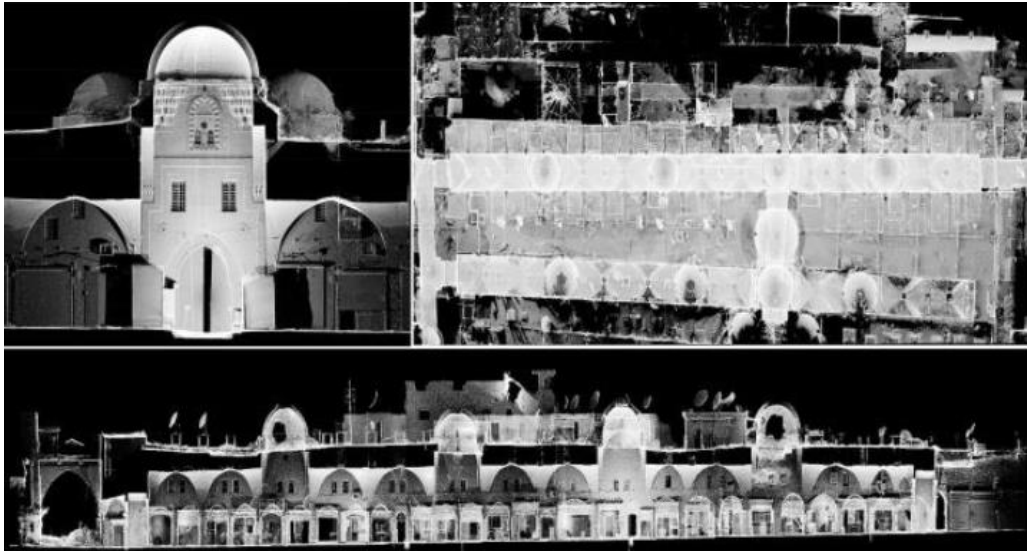


Figure 11- Souq Al- Saqatiyya Section and Site Plans (Ibrahim, 2020)



Figure 10- Souq Al-Saqatiyya Before and After the War in Aleppo (Yaghi, 2017)

Post the war, different frameworks emerged to address the challenges of the city revival and conservation, one of the applied frameworks aimed to tackle the rehabilitation of the ancient Souq of Aleppo, Souq Al-Saqatiyya. For Aga Khan Foundation, The Directorate General of Antiquities and Museums in Syria, and the different national stakeholders, reviving Souq Al-Saqatiyya was the seed for restoring and revitalizing the whole city. Reviving Souq Al-Saqatiyya was believed to be the catalyst that can boost the restoration and the revitalization of the whole city historically, economically, and culturally. That is because, in heavily destroyed cities, revitalization starts with reviving the social and economic core of activities to regain back the cities' original vitality after the war.²⁷ Restoring and reviving Souq Al-Saqatiyya started in 2018 by having the following:

1. Consultation with micro, meso, and macro stakeholders such as shop owners, community members, and policymakers.
2. Training local labor by international experts to conduct restoration techniques.

https://www.academia.edu/36666862/Restoration_Protocol_In_Conflict_Zones_Practical_Insights_From_The_Old_City_Of_Aleppo_

²⁷ Ibrahim, (2020), Decision Making Methodology: The City of Aleppo.

3. Creating Youth groups from Aleppo who were called *Subhuyyat* by Aga Khan Trust for Culture to help in the revitalization project.
4. Conducting consultation meetings that involved art and cultural classes, seminars, workshops, and events for nine months.²⁸

The main objective of conducting these steps was to prioritize the intervention action plan according to the local view and to create local expertise able to take part in the restoration process. Designing the intervention in a participatory manner was followed by the implementation that included: selective reconstruction, structural repairs, general rehabilitation, and developing the services in the Souk and surrounding it, as illustrated in figure (12).²⁹

Reviving the market had a great impact on the city, where it returned the commercial traffic back again after its restoration. Before the war, merchants and shop owners used to come from diverse social backgrounds: from the main city, the

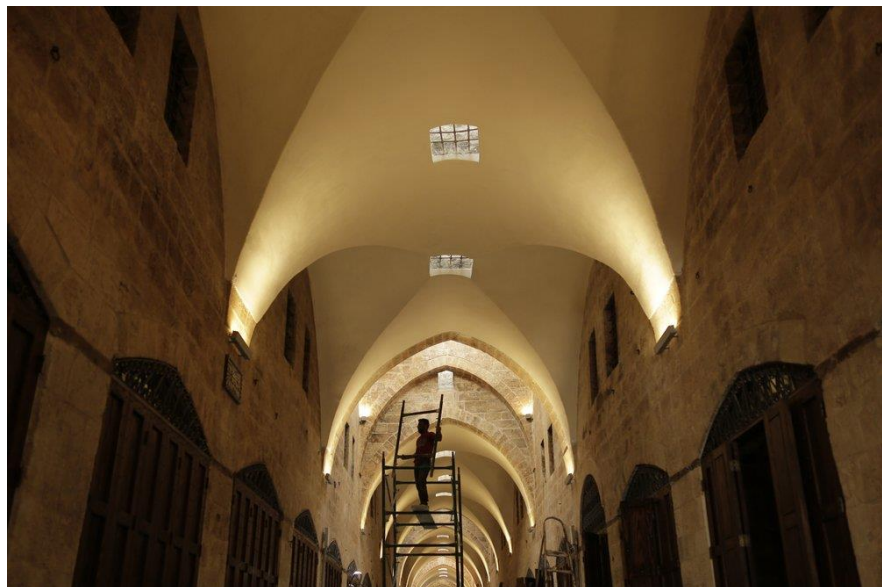


Figure 12- The Recovery of Souq Al-Saqatiyya (Egypt Independent, 2019)

outskirts, and the rural towns. After the restoration, the Souq has been activated again bringing back gradually who remained from the market users after the war. Moreover, reconstructing the Souq helped in restoring back the surrounding services and amenities that used to exist in its surrounding zone of influence. Not only that, but also the successful accomplishment of this project—within the anticipated timeframe, cost, and materials, and retrieving the function and vitality of the Souq—gave hope for the city and its residents that continuing the city restoration is achievable.³⁰

²⁸ Ibrahim, (2020), Decision Making Methodology: The City of Aleppo.

²⁹ Ibid.

³⁰ Ibid.

1.3. The Work of the UDF on Developing Cairene Public Markets

The UDF (Urban Development Facility) formerly known as the Informal Settlements Development Facility, ISDF, is an Egyptian governmental body that is accountable for funding redevelopment projects. Its work includes redeveloping lots of public markets in and outside the city of Cairo.³¹ Two of its implementable projects inside Cairo are:

1. Souq Ghazza, in Al-Zawiya Al-Hamra neighborhood.
2. Souq Al-Qunayyisa in Umraniya neighborhood.

The UDF has worked on developing Souq Ghaza by constructing steel structures for expanding the Souq on an empty land that has been used formerly as a car park, as illustrated in figure (13). The new construction along with the old Souq now includes 390 commercial stores. This new expanded Souq has been provided by a developed system for firefighting in order to make the market safer.³²

The UDF has developed Souq Al-Qunayyisa as well, which lies in Uthman Muharram area. In the past, the Souq was informal and unregulated, but now, it has been renovated and organized to include 66 stalls and 20 stands, as illustrated in figure (14).³³

It is observed that the UDF has worked on developing the two markets only without paying much attention to the relationship between the market and the context, and how the market can affect its surrounding zone and vice versa.



Figure 13- Souq Ghaza Development (ISDF, 2021)



Figure 14- Souq Al- Qunayyisa Development (ISDF, 2021)

³¹ ISDF. (n.d.). About the development facility. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/AboutGov.aspx?about=6>

³² ISDF. (n.d.). Souq Ghaza project detail. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/ProjectsDetails.aspx?project=15#>

³³ ISDF. (n.d.). Souq Al-Qunayyisa project detail. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/ProjectsDetails.aspx?project=18#>

1.4. An Example of Developing a Market in Integration With the Surrounding Context: The Work of Giza Governorate in Developing Souq Zinin

Another example of developing a Cairene public market is the work done to improve Souq Zinin in Boulaq Al-Dakrur by Giza Governorate in coordination with The National Council for Women. This project has been done as part of a fund granted by the “Safe cities free from violence against women and girls” program. Before the Souq has been developed, it was situated along Zinin street causing traffic, over-crowdedness, road misuse, and unsafety, as shown in figure (15). Now, it is the first market to be rebuilt with the highest environmental



Figure 15- Souq Zinin Before Development (Mahgoub, 2019)

and cultural specifications, as shown in the below figures (16) and (17), where it has been rebuilt to have 116 stalls and equipped with electricity, water, and waste management systems. The market has also been provided with waste collection units, fire extinguishing units, WCs, and surveillance cameras to provide safety for female users. Moreover, the market has been attached with a dedicated area of 160 m² for children and women, as shown in the below figure (18), since most of the stalls have been rented to female vendors. The development plan also

included literacy courses for the women sellers as part of assisting them and upgrading their educational level. The development also included revitalizing Zinin street and the surrounding area.³⁴

This development has been conducted as part of the urban regeneration adopted by the “Safe cities free from violence against women and girls” program to make public areas safer for the society in general and for women in particular.³⁵



Figure 16- Souq Zinin After Development (Khalafawi, 2019)



Figure 17- Souq Zinin After Development (Khalafawi, 2019)



Figure 18- The Attached Area to Souq Zinin After Development for Women and Children (Khalafawi, 2019)

³⁴ Khalafawi, S. (2019). Zinin market frees Boulaq Al-Dakrur from flea vendors. *Youm7*. Retrieved from: <https://www.youm7.com/story/2019/10/17/116/4461668/-الباعة-الجانلین-بولاق-الدکرو-من-الباعة-الجانلین-إنشاء>

³⁵ Ibid.

1.5. Problem Definition

Despite the power of public markets in influencing neighborhoods and cities by their development in the former European and Syrian examples, there has been limited attention given from the Egyptian scholars and civic and governmental entities to the notion that developing Cairene³⁶ public markets can be a transformational tool for the market's zone of influence³⁷. There are some studies conducted on Cairene public markets such as the previously mentioned work of the Urban Development Facility and Giza governorate on the development and redesign of public markets in informal areas. However, the reciprocal relationship between the market and its zone of influence has been limitedly investigated. Therefore, this research aims to examine and elaborate on this relationship by generating a general development framework that can be used for analyzing and developing Cairene public markets in integration with their zone of influence revitalization. The zone of influence revitalization includes urban growth and regeneration, fostering socio-economic development, and quality urban life. This development framework is based on two main pillars: first, studying the public markets' dynamic components and systems in relation to their surroundings (such as positioning, mobility, management, infrastructure, social systems, built systems, economic systems, supply systems, ...etc.). The second pillar is proposing guidelines about how the markets' internal components and systems should be developed in relation to revitalizing their zone of influence. This development framework is designed generically, fitting all types of markets with no specificity, to evaluate the functioning of any existent market and create a guide for its development. This development framework is also a guide for building new markets.

³⁶ Only the Cairene public markets have been selected for this study due to limitations of researching public markets in other cities in the country of Egypt.

³⁷ The zone of influence of the market is the area affected by the market's performance and functioning systems and components, it can be the surrounding neighborhoods and communities in mega cities and large portions of the city in mini cities, and whole towns in town villages. The zone of influence can include planned/unplanned, formal/informal areas.

1.6. Hypothesis and Objectives

Fostering the sustainable development, growth, and management of the market is a key catalyst for revitalizing the market's zone of influence.

Objectives:

Objective 1: to study the market's main functions, components, systems, and its development in relation to the surrounding context's revitalization.

Objective 2: to generate a general framework that can help analyze the market and propose guidelines for its development in integration with its zone of influence revitalization.

Objective 3: to integrate the government, market management body, and market users' roles in the development framework to achieve a balance that can prosper the market and its surrounding area.

Objective 4: to examine the formality/informality of public markets inside the framework, and how that corresponds to the level of safety, security, environmental aspects, pollution, regulation, accessibility, urban density, infrastructure, resource flow, diversity, socialization, and employability.

Objective 5: to apply the development framework on a public market in the city of Cairo, showing an example of how the framework can be used on an existing case study.

1.7. Methodology

The methodology adopted to achieve the research objectives is based on two main parts which compose the core chapters of this research. The first part is the theoretical basis that constitutes the first three chapters, whereas the second part is the empirical study which constitutes the fourth chapter.

The theoretical basis in the first two chapters demands using secondary research methods that look into existing literature to know about the centrality of public markets, and their zone of influence revitalization through the development of markets with selected examples. These secondary research methods also extend to show the market's evolution over time, and how it became an intricate system of objects in our current time. Moving forward, the theoretical base—through the secondary research methods—looks at theories and approaches that are used for analyzing and dissecting any object into its basic units and their relationships. Here the theoretical base focuses on the Actor-Network theory, the ANT, as the

main theory while showing its deficiency, and how it can be used in complementation with other theories and approaches such as the Marxist theory of production and the specific, measurable, tangible, and timely systems, the SMTT systems approach.

The theoretical basis in the third chapter demands using both secondary and primary research methods. Secondary research depends on looking into the existing literature and current studies to know about the market’s main functions, dynamic systems, and components in correspondence with its zone of influence. Complementing the literature review, the researcher looks at several existing markets in Cairo using primary qualitative research methods. These methods are based on paying 14 field study visits to seven different Cairene markets³⁸, where five visits have been paid to Souq Al-Sayyida ‘Aisha, and Souq El-Itneen (in spring 2020 afternoon to sunset for both Souqs), four visits have been paid to Souq Al-Tunsi, and Souq Al- Jum’a (two visits in spring 2020 and two visits in fall 2020 from morning to sunset for both Souqs) and five visits have been paid to Al-Azhar street, Souq Al-‘Ataba, and Khan Al-Khalili (five visits in spring 2020 from morning to evening time for all Souqs). The 14 field study visits included conducting observations and interviews with 20 merchants, 5 **auxiliary workers**,³⁹ and 11 customers as illustrated in table (1):

Table 1- The Number of Interviewees in Each Souq

The name of the Souq and the type of the interviewee	Souq Al-Sayyida ‘Aisha	Souq El-Itneen	Souq Al-Tunsi	Souq Al-Jum’a	Al-Azhar street	Souq Al-‘Ataba	Khan Al-Khalili
Merchants	3	2	4	3	3	2	3
Auxiliary workers	-	-	2	-	2	1	-
Customers	2	1	2	2	-	2	2

The interviews are based on structured questionnaires that can be found in appendix C, and the data—obtained from the interviews and the observations—were analyzed using thematic analysis. The thematic analysis was based on classifying the data into definite themes that are explained in chapter three in section 3.2. This primary method has been conducted for the aim of gaining practical knowledge about how the markets’ components and systems

³⁸ The researcher has conducted primary research on markets in Cairo city only, not greater Cairo.

³⁹ Auxiliary workers include all workers who facilitate the exchange process for the merchants and the customers such as: car drivers for transporting the goods to the customer’s homes, baggers for carrying the goods, and technicians who can assemble and disassemble the goods like carpenters, plumbers, ...etc.

dynamically interact with the various systems of the surrounding neighborhoods and communities, thus, generating collective analytical lenses. The theoretical base uses these lenses in generating the development framework for analyzing public markets and their impact on their zone of influence as well as proposing guidelines for their development

Moving progressively, the empirical study in chapter four starts with applying the development framework through using both secondary and primary research methods. The secondary research methods in this empirical study look into the literature about the general context and profile of the Cairene public markets in an attempt to gain an overview of the surrounding problems/potentials and the specific nature that is tied to the Cairene context. The secondary research methods also examine the state of the city of Cairo, its need for urban regeneration especially for its informal communities, and the strong relation of Cairene public markets with the informal settlements in Cairo.

The empirical study then uses primary qualitative research methods for collecting data about the market under study, Souq Al-Tunsi, and its surrounding urban context. These qualitative methods have been based on conducting nine field study visits to the market setting and its surrounding area. These visits were paid in fall 2020, five visits from morning time to afternoon, and four visits from afternoon to sunset. The nine field study visits included taking footage of the market and its surrounding area, and conducting observations and in-depth interviews with 13 merchants, 3 auxiliary workers, and 5 customers. Another interview was conducted with an urban designer in the ministry of housing, utilities, and urban communities. The interviews are based on structured questionnaires that can be found in Appendix D, and the data obtained from the interviews and the observations were analyzed using thematic analysis. This type of analysis was based on classifying the data into the schema structured themes mentioned in chapter four in section 4.5.1. The qualitative methodology used to acquire data about the market is intertwined with other secondary research that encompasses additional information about the market and its zone of influence.

Using all the information collected about Souq Al-Tunsi through primary and secondary research methods, the researcher applies the development framework on the specified market by analyzing it and proposing guidelines for its development in integration with its zone of influence revitalization.

The whole methodology can be summarized in the below table (2)

Table 2- The Methodology Used

Base	Method: Primary/ secondary	Aims	Activities	Target population	Context	Time frame	Findings
Theoretical base	Secondary research methods	<p>To study the following:</p> <ul style="list-style-type: none"> The centrality of public markets. The neighborhoods' revitalization through the development of markets with selected examples. The market's evolution over time and its intricate systems of objects, components, and functions in our current time. Theories and approaches for analyzing and dissecting any object into its basic units and relations such as the ANT, the Assemblage theory, the SMTT systems, and the Marxist theory of production. The market's main functions, dynamic systems, and components in correspondence with its zone of influence. 	Looking in the existing literature and current studies	N/A	N/A	N/A	The literature findings are used in examining the market and its reciprocal relationship with its zone of influence as well as developing the development framework.
	Primary research methods	<p>To examine the following:</p> <ul style="list-style-type: none"> The market's main functions, dynamic systems, and components in correspondence with its zone of influence. 	<p>Conducting 14 field study visits that comprise observations and interviews. Interview questions are listed in appendix C.</p>	20 merchants, 5 auxiliary workers, and 11 customers as detailed in the table (1).	<ul style="list-style-type: none"> Souq Al-Sayyida 'Aisha Souq El-Itneen Souq Al-Tunsi Souq Al- Jum'a Al-Azhar street Souq Al-'Ataba Khan Al-Khalili 	<ul style="list-style-type: none"> 5 visits to Souq Al-Sayyida 'Aisha, and Souq El-Itneen (in spring 2020 afternoon to sunset for both Souqs). 4 visits to Souq Al-Tunsi, and Souq Al- Jum'a (2 visits in spring 2020 and 2 visits in fall 2020 from morning to sunset for both Souqs). 5 visits to Al-Azhar street, Souq Al-'Ataba, and Khan Al-Khalili (5 visits in spring 2020 from morning to evening time for the three Souqs). 	Data are analyzed by a thematic analysis (as mentioned in detail in section 3.2.) and used in developing the analytical lenses of the development framework.

Base	Method: Primary/ secondary	Aims	Activities	Target population	Context	Time frame	Findings
Empirical base	Secondary research methods	<p>To study the following:</p> <ul style="list-style-type: none"> The general profile of Cairene public markets, their problems, and their specific nature that is tied to the Cairene context. The state of the city of Cairo, and its need for urban regeneration. The strong relationship of Cairene public markets with the informal settlements in Cairo. Souq Al- Tunsî and its zone of influence. 	Looking into existing literature and current studies.	N/A	N/A	N/A	<p>The findings are used to gain an overview of the surrounding problems/potentials and the specific nature of public markets that is tied to the Cairene context. The findings are also used to get information about Souq Al-Tunsi and its zone of influence to be used in the application of the development framework on the case study.</p>
	Primary research methods	To collect data about Souq Al-Tunsi, and its surrounding urban context.	<p>Conducting 9 field study visits that comprise observations, footage, and interviews. Interview questions are listed in appendix D.</p>	13 merchants, 3 auxiliary workers, and 5 customers in Souq Al-Tunsi, and an urban designer in the ministry of housing, utilities, and urban communities.	Souq Al-Tunsi	<ul style="list-style-type: none"> In fall 2020: 5 visits have been paid to Souq Al-Tunsi from morning time to afternoon, and 4 visits from afternoon to sunset. 	<p>Data is analyzed by a thematic analysis (as mentioned in detail in section 4.5.1.) and used in applying the development framework on Souq Al-Tunsi.</p>

Chapter 2: Literature Review

2.1. Introduction

This chapter starts by investigating how public markets evolved across history developing different social, economic, political, and regulatory systems. Then it shows how they grew with the act of commercialization to reach their current form in the present time. The chapter moves to discuss how the market is viewed as an intricate system of objects, and thus shows the need to pick a theory that hammers on the composition of a system in a given space and studies the relations between its various components. The chapter briefly examines the two main theories that speak about the system composition, components, and actants: the Actor-Network theory, the ANT, and the Assemblage theory. The chapter picks the ANT theory as the main analytical lens, as it is the only theory that taps on all types of topologies: Network, Euclidean, and Fluid, unlike the Assemblage theory which is based on only fluidity, exchangeability, and multiple functionalities.⁴⁰ Picking the ANT theory, the chapter discusses in detail its different aspects: the functions, actants, and relations of a certain object, and the different types of objects in relation to their spatial topologies. Afterward, the chapter examines fluidity and spatial resilience that are attributed to a certain type of objects in the ANT, then it examines the intersection between the different types of objects in real life. The chapter thereafter highlights the deficiencies of the ANT and attempts to fill in its gaps by studying the SMTT (Specific, Measurable, Tangible, and Timely) systems approach and the Marxist theory of production. The chapter discusses the two types of systems in the SMTT systems approach and uses the Marxist theory as a method to study these systems, examine their evolution and investigate how they affect each other. Finally, the chapter clarifies how the Marxist scientific method is used to investigate the nature of social production, and the mode of production including the elements, relations, and forces of production.

2.2. The Evolution of Markets

Public markets, as widely known, are gathering spaces for people for the aim of sale and purchase of food, goods, livestock, and other commodities. They have existed in recorded history as early as the Babylon and the early Middle Eastern and Mediterranean empires as they have been a core notion of development and civilization, acting as city centers and vital

⁴⁰ Buchanan, I. (2015). Assemblage theory and its discontents. *Deleuze Studies*. doi:10.3366/dls.2015.0193.

active spaces.⁴¹ With the progression of markets over history, a clear manifestation of the market—as a well-developed institution that has its own territory, boundary, and governing rules—was evident in Islamic cities starting from the seventh century. Markets in Islamic cities were called *Souqs*, and their origins followed two main theories⁴²:

1. The theory by Savage, Grunebaum, and Riefstahl suggests that Souqs developed from Roman and Greek commercial facilities, where they evolved from the Roman basilica macellum and forum as part of the city Islamization⁴³. Evidence of this theory can be found in cities of pre-Islamic origin such as Aleppo and Damascus where exchange activities remained in the same place as in the past Roman time. However, gradual transformation occurred over time in the Islamic period when the streets were encroached by shops and arcades were occupied by booths, resulting in a new urbanscape.⁴⁴
2. Another theory suggests that the Souq was a pure oriental institution that was there before Islam and grew further with the Islamic civilization because Islam was born on a land of great experience in the trade between Yemen and Sham cities⁴⁵. Thus, markets did exist in the Arab lands and became well manifested with the foundation of the Islamic city. Prophet Muhammad (Peace and blessings be upon him), when laying down the foundation of the first Islamic city, Al-Medina, located the Souq next to the Masjid (which was considered at its time the main religious institution) to accentuate the social interaction of the Muslims in the commercial activities along with the religious act of prayer, forming a communal physical center.⁴⁶

In these early years, Souqs were semi-open without being totally covered, till the Umayyad Rule in the late seventh century, where Souqs started to have an enclosed shelter out of a climatic and an economic requirement. In this Umayyad era, markets followed the same logic of development as in the early Islam days, where Souqs developed in the central urban complexes that comprised the Masjids and the religious schools connecting the royal administrative quarter with the residential quarter. Souqs, in the mid-Umayyad era, were made

⁴¹ Casson, M., & Lee, J. (2011). The origin and development of markets: A business history perspective. *Business History Review*, 85(1), 9-37. doi:10.1017/S0007680511000018

⁴² Awad, J. (1989). *Islamic souqs (bazaars) in the urban context: The souq of Nablus* [Master's dissertation, Kansas State University]. College of Architecture and Design, Kansas State University. Retrieved from: <https://core.ac.uk/download/pdf/33362255.pdf>

⁴³ Ibid

⁴⁴ Ibid

⁴⁵ Ibid

⁴⁶ Ibid

with assigned places for the traders and the craftsmen. They were considered a focal point along with the Masjids for the Islamic city and they were always built next to each other in the center of the city. The Souq had a hierarchical arrangement of trades where certain kinds of goods were placed near the Masjid, others were located near the city gates, and the remaining were placed in between. Souqs were also built and rented to traders in many Islamic cities such as Souq Al-Qayrawan in Tunisia and Souq Al-Fustat in Egypt.⁴⁷

Moving forward to the Abbasid dynasty that spanned from the eighth century to the thirteenth century, many Souqs were built mostly in Iraq by the Abbasids and in Iran by the Seljuks. Souqs in this dynasty were made of Khans and Qaysariyyas, and they had a great influence on urban history to the extent that streets and urban districts were named after the traders and the craftsmen who worked there. Followed by the Mamluks in the mid-thirteenth century to the sixteenth century, Souqs continued to be built or refurbished in Syria, Egypt, and Turkey.⁴⁸

On the other hand, European Markets, between the twelfth and the fourteenth centuries, always developed near to castles, royal residences, and monasteries as these places were large centers of consumption. European markets protected their trade by a charter that would oblige them to pay an annual fee, known as *the farm*.⁴⁹ Markets were either promoted by:

1. Their occupants of local merchants and craftsmen who were monitored “through self-governing guilds”, while having the major regulations set by local officials.
2. Or by local burgesses who had acquisition of the market plots and “would regulate the market and collect its tolls to pay for the farm”.⁵⁰

Thus, markets had systems that were political, social, and economic, these systems were governed by regulations that controlled quality, pricing, freedom of entry, and so forth. These regulations were enacted by “law, agreement, and social convention” and they worked to keep the repute of the market system. These regulations are still present in our current times but with other forms and terminologies.⁵¹

The growth of the markets over history, both in European and oriental cities, depended on commercialization, where economic development and urbanization turned small local

⁴⁷ Awad, (1989), Islamic Souqs in The Urban Context.

⁴⁸ Ibid.

⁴⁹ Casson, & Lee, (2011), The Origin and Development of Markets, p.14.

⁵⁰ Ibid.

⁵¹ Ibid, p.13.

fragmented outlets and itinerant tradesmen into large-scale marketplaces with fixed/semi-fixed shops and clearly defined paths and access points. The growth of shops provided a permanent place of exchange and a stable connection between the merchant and the consumer. Some opinions might argue that by the expansions of shops, markets had declined, however, shops whether fixed or enclosed were found to be “within and outside the marketplace”⁵². Hence, they were also one of the constituents of the public market. Not only that, but they also formed centers of production as they were often associated with “workshops and family dwellings of artisans”⁵³. With the emergence of shops, *selds* came into being, they were “bazaar-like structures, set back from the street”⁵⁴. *Selds* aimed at displaying goods in front of street passersby to increase attraction.⁵⁵

With the growth of markets, fairs were held annually and occasionally to provide temporary “outlets for higher value trade”⁵⁶. Fairs were related to religious and social festivals, where large crowds served as potential customers and were a great chance for trade. Fairs were privileged by having “local, regional, national, and international affairs” as well as providing high-value commodities that normal shopkeepers would not afford the expenses generated out of stocking them on a regular basis⁵⁷. In medieval Europe, international fairs were held in Eastern England, Flanders, Champagne, as shown in figure (19), and the Lower Rhine. With the growth of demand, some of the high-value commodities were offered through permanent shops, yet that did not intrude with the occurrence of fairs.⁵⁸



Figure 19- A Fair in Champagne in the 13th Century, Paris
(Epic World History, 2020)

Fairs continued to exist with different scales in our current time with a more modern form specializing in lots of fields with occasional occurrences. In the city of Cairo, there are

⁵² Casson, & Lee, (2011), *The Origin and Development of Markets*, p.17.

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

⁵⁶ *Ibid.*, p.16.

⁵⁷ *Ibid.*, p.17.

⁵⁸ *Ibid.*

fairs for furniture, home accessories, stationery, books, arts, and botany as shown in figures (20), (21), and (22).

From the fifteenth century to the seventeenth, markets expanded in scope progressively due to the growth of credit and expansion of regional and international trade. However, within this time, markets passed by periods of economic stagnation that happened as a result of political instabilities, famines, and wars.⁵⁹



Figure 20- Syrian Fairs for Home Accessories, (El-Balad News, 2017)



Figure 21- Cairo International Book Fair (2020)



Figure 22- Al-Orman Spring Botany Fair (Ahramonline, 2020)

Approaching the eighteenth century, major developments occurred in retailing, especially in Europe. Shops became more advanced, well-furnished, and lit with glass frontages; advertisements started to appear for fashionable goods and latest trends. Still, markets remained “an important component of the urban economy” and continued to expand especially in economically less developed areas⁶⁰. However, markets tended in this era to be more specialized and wholesale.⁶¹ At this time of history, there were specialized markets with definite types such as:

- Farmers
- Fish
- Flea
- Furniture
- Flower
- Food halls
- Antiques
- Crafts

⁵⁹ Casson, & Lee, (2011), The Origin and Development of Markets.

⁶⁰ Ibid, p.22.

⁶¹ Ibid.

- Home accessories ⁶²

Moving forward in history to mass production, the system required a more extensive and effective retail mode something that “small shopkeepers or public markets and fairs could not offer”⁶³. That led to the rise of department stores that provide a great volume of production for the growing consumer demand. An example of these department stores was

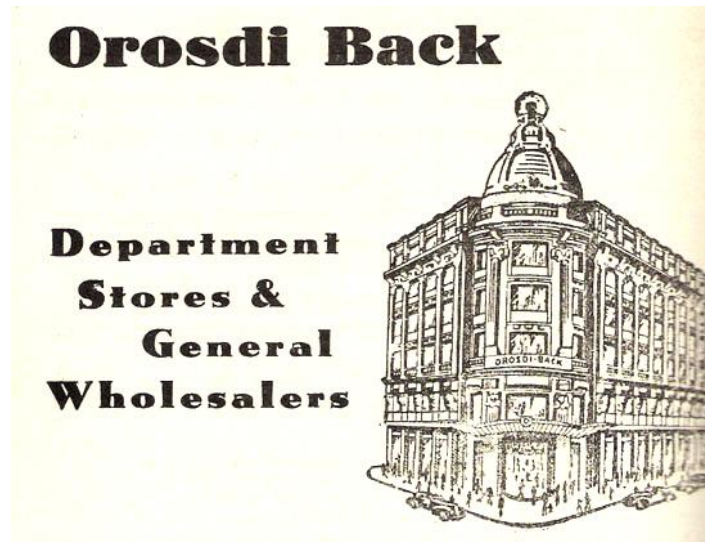


Figure 23- Orosdi-Back Ads (Orosdi-back, 2020)

Orosdi-Back—also known as Omar Effendi—as illustrated in figure (23), which was established in Cairo in 1856. Another example was Le Bon Marché, which was established in Paris in 1880, as illustrated in figure (24), and then became “the world’s largest department store by 1906”. ⁶⁴

Department stores had features that were very distinctive and seductive unlike public markets, they had intricate advertising, bright displays, and fashionable interior design. Shopping in such a medium became a social leisure activity rather than a need, unlike public markets. Engagement techniques here played a huge role in the success of



Figure 24- Le Bon Marché in 1880 (Complete France, 2016)

⁶² Costa, N., Mackay, M., Perez, O., & Navarro, G. (2015). Urban markets: heart, soul, and motor of cities, making city markets the drivers of sustainable urban development. *Institut Municipal de Mercats de Barcelona (IMMB)*. Retrieved from https://urbact.eu/sites/default/files/urbact_markets_handbook_250315.pdf

⁶³ Casson & Lee, (2011), *The Origin and Development of Markets*, p.18.

⁶⁴ *Ibid*, p.19.

department stores and the development of malls in our present time. Department stores also succeeded because they grew to be institutional commercial structures not just sole merchants or producers but a whole entity that works in production, distribution, marketing, and display.

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With the rise of capitalization, wholesale systems, and the development of chain stores in the twentieth century, public markets have witnessed a noticeable decline and have become more of *free markets*. However, they did not disappear from the urban landscape, where they succeeded in “recovering their traditional character of being an urban fact that has a completely different experience from the generic and controlled environment of the hyper places and department stores”.⁶⁶ Public markets retained culture and heritage and integrated the shopping experience within. They were also remarked to hold freedom of institutional control, thus giving room for small and medium businesses to sell cheaper goods to the middle and lower classes of public consumers. Moreover, markets in urban centers were distinguished to offer a wide range of commodities and services thus meeting the public demands unlike other forms of shopping and retailing. These distinct features as well as the centrality of the public markets inside the cities were the main drivers for the markets’ existence up to this moment.⁶⁷

Nowadays markets in our contemporary city may seem modern, but still, some medieval features exist under disguise. Addressing the evolution of markets across time, as illustrated in the below figure (25), has revealed these medieval features in their current modern form and the systems that developed over time to supply certain demands in the societies. This provides the researcher and reader with a better understanding of how the market reached its current functions, components, relations, and systems tied by the surrounding context and the demand of public consumers. Addressing the growth of markets also clarifies the evolution of the different social, economic, political, and regulatory systems that have developed over time inside the market. By knowing how these systems developed, a study of how these systems currently work together can be achieved, and a study of how they can potentially develop for the growth of the markets and the prosperity of their zone of influence can be realized.

⁶⁵ Casson, & Lee, (2011), *The Origin and Development of Markets*.

⁶⁶ Caramaschi, (2014), *Public markets*, pp. 3-4.

⁶⁷ *Ibid.*

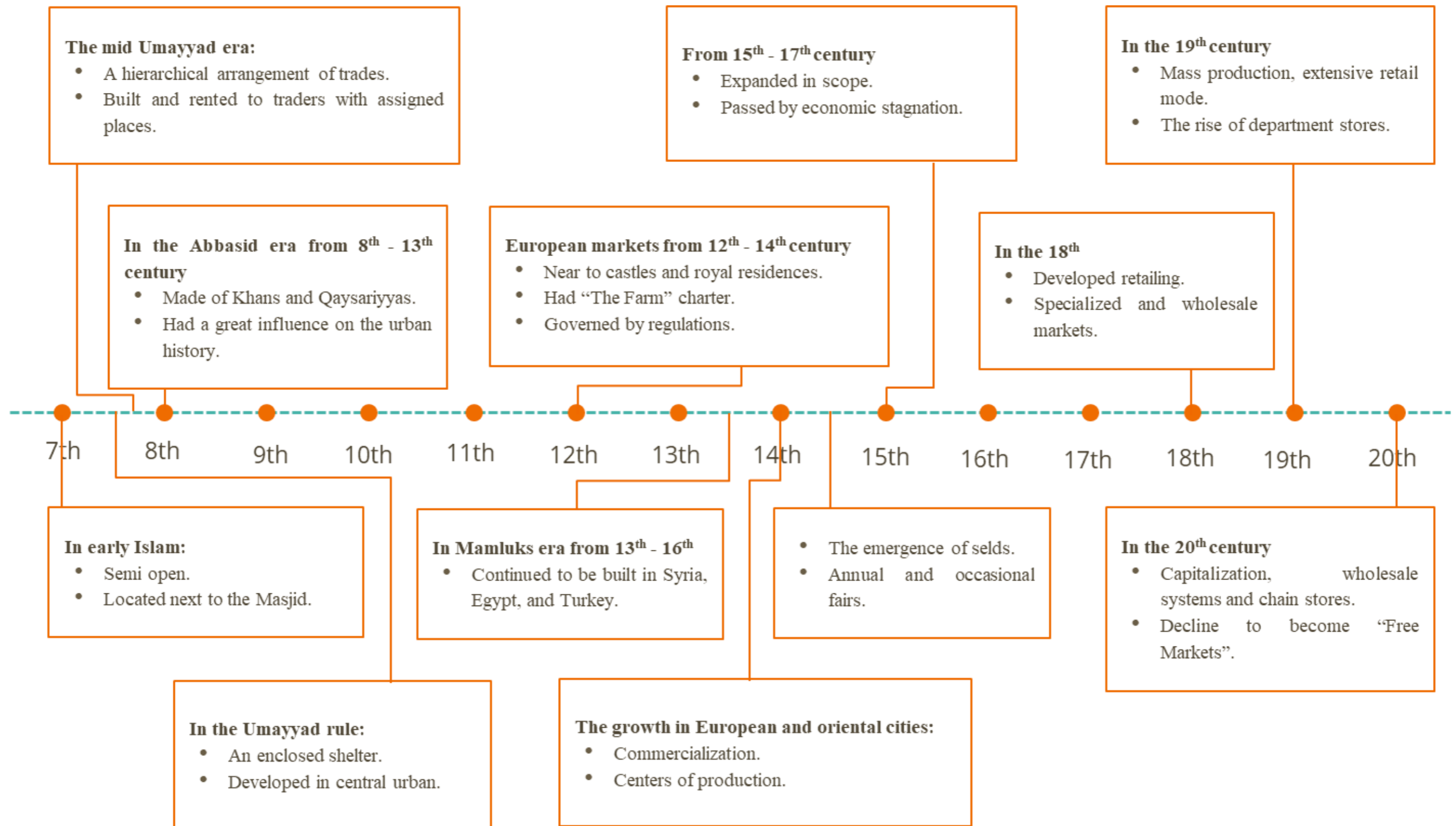


Figure 25- Summary of the Evolution of Markets Across Time

2.3. The Market as an Intricate System of Objects

If we look up now public markets in different literature, we find them in urbanism referred to as city centers and major activity hubs with social nodes. In economics, they are regarded as “intersections of supply and demand”⁶⁸. In sociology, it is “the most socially diverse public places in a community” where it brings diverse people of different genders, ethnicities, races, socioeconomic status, and ages together “around the experiences of food, shopping, and conversation”⁶⁹. Through critical observation of public markets’ growth over history and their current existence, it is evident that they are a system of different objects working together in integration, the kind and scale of these objects and the relations between them determines the variation between markets and make them distinguished from each other across time and place. In order to further understand the dynamics inside the market and propose a strategy for developing them and their zone of influence, the different objects, components, and relations in the public market need to be determined and analyzed based on a grounded theory that speaks about such aspects.

2.4. Theories Speaking About Objects, Compositions, and Assemblages

The two main theories that speak about objects and their components—that work together in relation in order to perform a certain function or form a certain assembly—are the Actor-Network theory, the ANT, and the Assemblage theory. Both theories, as shown in the below figure (26), talk about the composition of a system in a given space and study the relations between the various components in the system, and how these components are interwoven together in a functional assemblage, where all are effects of a collective activity⁷⁰. However, the Assemblage theory tackles only one type of object which is the Fluid object, where it only speaks about fluidity, exchangeability, and multiple functionalities. Whereas the ANT taps on all types of objects: the Network, Euclidean, and Fluid objects, as well as demonstrating their stability in relation to spatial topologies. The ANT also surpasses the Assemblage theory by speaking about the possible intersections between the different types of objects in real life, thus, the ANT theory has a broader scope and threshold.⁷¹ That is why the

⁶⁸ Casson & Lee, (2011), *The Origin and Development of Markets*, p.13.

⁶⁹ Pannozo, (2013), *Policy Paper on the role of Urban Markets*, p.9.

⁷⁰ Buchanan, (2015), *Assemblage Theory and Its Discontents*; Shoaib, H. (2015). *Highway urban assemblage: A strategy for the regeneration of public spaces* [Doctoral dissertation, Cairo University]. Faculty of Engineering Cairo University, Pp 39-41.

⁷¹ Buchanan, (2015), *Assemblage Theory and Its Discontents.*; Shoaib, (2015), *Highway Urban Assemblage*.

ANT theory will be used as the main lens for analyzing the market's components and relations, thereof, the ANT theory is demonstrated below.

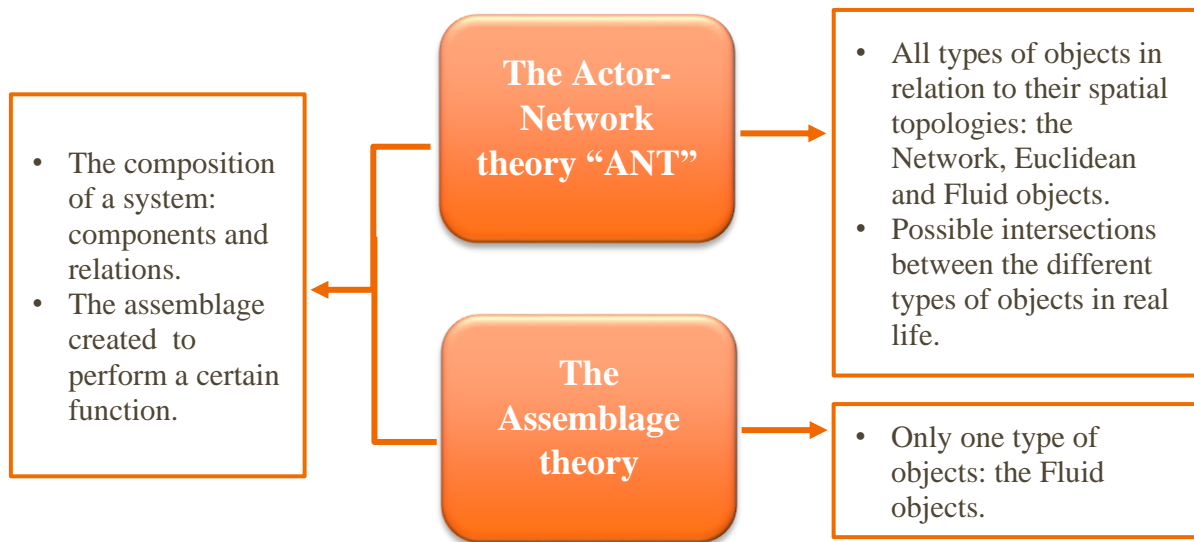


Figure 26- Theories Speaking About Objects, Compositions and Assemblages.

2.5. The Actor-Network Theory, the ANT

The ANT is a theory that emphasizes a heterogeneous combination of conceptual, social, textual, and technical actors, where all components of a network are significant to each other for performing a certain function. An *actant/actor*, in the ANT theory, is a sole or a collective agent that can get associated with other agents, where the nature of the actants is not defined by their own selves, but rather by the network of relations they get associated with to carry out the function of the object.⁷²

According to Law, the network of the actants make up the Network Object, “in other words, Network objects are an effect of stable arrays or networks of relations”⁷³. For example, a marine vessel is a Network object that contains a set of actants such as “the hull, spars, sails, ropes, guns, food stores, sleeping quarters and crew” as explained by Law⁷⁴.

As illustrated in the below figure (27), the relations between the actants can be unidirectional or bidirectional depending on the function they perform. For instance, the food store and the crew have a unidirectional relationship stemming from the function of the food

⁷² Farías, I., Bender, T., & Portales, U. D. (2012). Urban assemblages: How Actor-Network theory changes urban studies. *Florence: Routledge Ltd.* doi:10.4324/9780203870631; Shoaib, (2015), Highway Urban Assemblage.

⁷³ Law, J. (2002). Objects and spaces. *Theory, Culture & Society*, 19(5-6), 91.

doi:10.1177/026327602761899165

⁷⁴ *Ibid*, p.93.

store that supplies food and nutrition to the crew. Whereas the relationship between the navigation system and the crew is bidirectional, where the crew operates the navigation system, and the navigation system provides steering and direction-finding to the crew. The relationship can also be direct or indirect, for example, there is an indirect relationship between the sails and the navigation system, where the navigation system provides the location and orientation

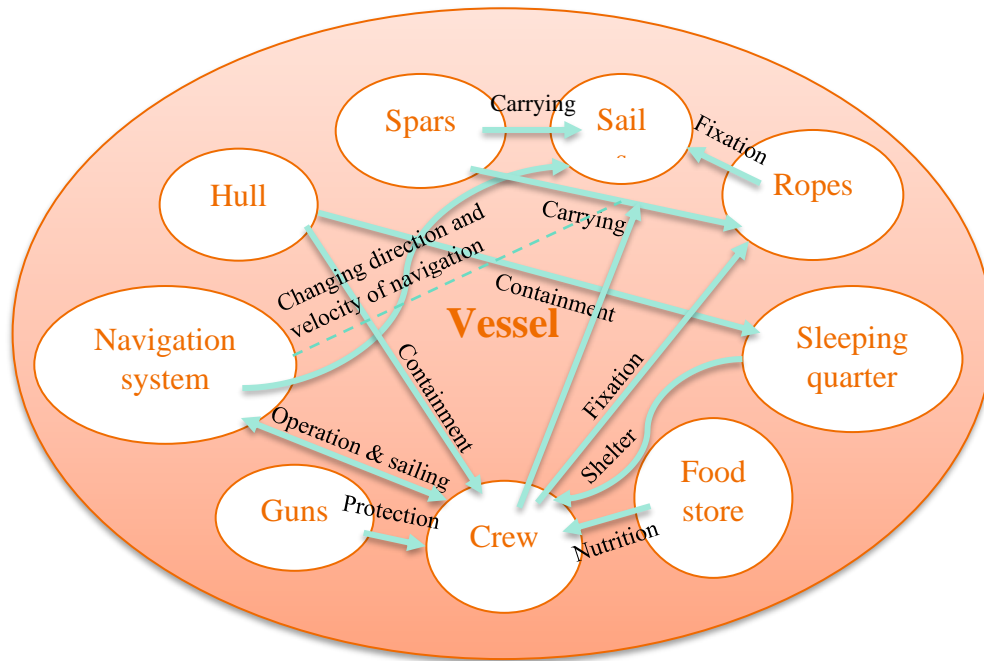


Figure 27- The Vessel as an Object in the ANT Theory. The author's drawing reflects Law's example of a Network object, (Law, 2002, p.93)

and thus provides the directionality of the sails for the vessel to reach its destination. However, the sails cannot get their right direction unless there is a mediating actant, *the crew*. Moreover, the relationship can be permanent or temporary depending on the permanence or temporariness of the actant, for example, the guns are used by the crew as a means of protection, but once the missiles are all fired, the relationship that is constructed between the crew and the gun ends by the absence of the missiles. Therefore, there are temporary actants with temporary relationships, once these actants are absent, the relationship is terminated. That is how objects work under the ANT theory, and as Law suggests, any object is sustained as long as each actant and the relations associated with it to other actants stay in place. Thus, any absence of an actant or any break of a relationship between two or more of the actants can result in partial or full failure of the object's functioning. That means that the continuity of an object's existence and functionality depends on the continuous presence of actants and "the stability of the syntax, logic, and pattern of those relations between the actants".⁷⁵

⁷⁵ Law, (2002), Objects and spaces, p.95.

2.5.1 Types of objects and their relation to spatial topologies

Having objects implies having spaces of certain spatial topologies that affect and get affected by the object ⁷⁶. That means that the different types of objects help shape certain spatial topologies and the reverse. According to Law, there are three types of objects, as shown in figure (28), that implies three types of spatial topologies:

1. The first type is the Network object that is constructed by stable relations of its actants to perform a certain function. Network objects are stable not by the fixed positioning of their actants, but rather by stabilizing the connections between the actants and keeping them intact and stable. Network objects create Network topology.⁷⁷
2. The second type is the Euclidean object that is constructed and stabilized by “a constant set of orthogonal coordinates” to carry out the specified function of the object⁷⁸. Euclidean objects are not only stable by stabilizing the connections between the actants but also by

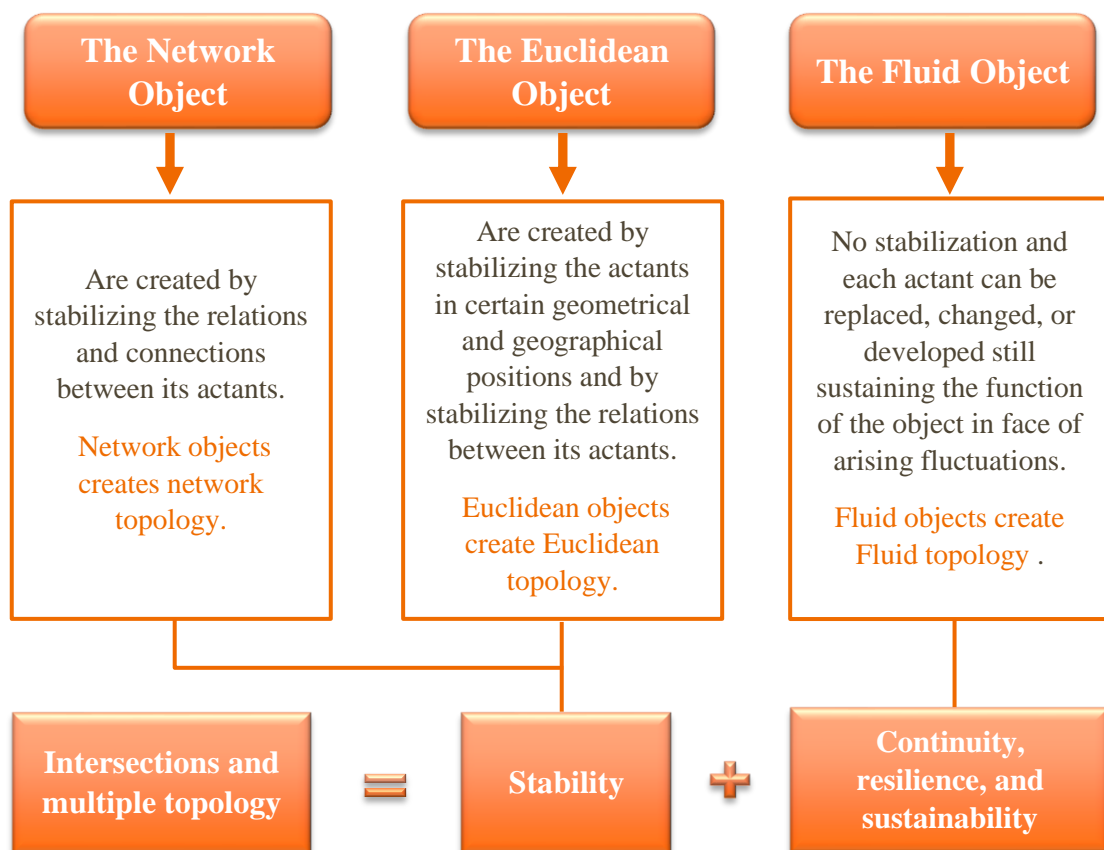


Figure 28- Types of Objects and Their Stability in Relation to Spatial Topologies

⁷⁶ Law, (2002), Objects and spaces, p.92.

⁷⁷ Ibid.

⁷⁸ Ibid, p.95.

keeping the actants in certain geometrical and geographical positions. Euclidean objects create Euclidean topology.⁷⁹

3. The third type is the Fluid object that contains “a set of actors that all share a certain family resemblance”⁸⁰. Fluid objects are different from the Network and Euclidean objects in that each actant can be replaced, changed, or developed still sustaining the function of the object in face of arising fluctuations. Fluid objects create Fluid topology.⁸¹

2.5.2 Fluidity and spatial resilience

Fluidity or Fluid objects amongst the other two types of objects and spatial topologies are the most resilient thus the most sustainable form of objects and topology. Fluidity depends on the variability of the actants that shifts to adapt to new conditions and circumstances by changing shape and working in different ways, so, there is “no fixed structure, no basic agenda”⁸². Thus, actants are neither stable in position nor relationships, rather they keep changing to reach the optimal functionality suiting time, context, and situation. They simply *adapt* with their fluid composition and that drives them to success. Hence, a Fluid object “holds its shape in a fluid manner enacting a fluid form of space” that is marked to have high spatial resilience.⁸³

Fluid spaces also have the merits of having different shapes and figures unlike Network and Euclidean objects. That is because the “more different actors that can be connected to the sort, the more possible shapes and figures a certain fluid space can take on, the more moveable it becomes”⁸⁴. Thus, a fluid space can be associated with many different places because constructing the space can be done in different possible ways. An example of fluid spaces can be seen in bathing places, football pitches, climbing trees, and most importantly *markets*. These spaces can be easily constructed by different actors, so they are demonstrated in different places with different manifestations.⁸⁵

In order to understand fluidity more deeply, a closer look at fluid spaces is made. According to John Law, there are some rules defining fluid spaces:

⁷⁹ Law, (2002), Objects and spaces, p.95.

⁸⁰ Kärholm, M., Nylund, K., & Prieto de la Fuente, P. (2014). Spatial resilience and urban planning: Addressing the interdependence of urban retail areas. *Cities*, 36(1), 121-130. Retrieved from: <https://doi.org/10.1016/j.cities.2012.10.012>

⁸¹ Ibid.

⁸² Law, (2002), Objects, and spaces, p.99.

⁸³ Ibid.

⁸⁴ Kärholm et al., (2014), Spatial resilience and urban planning, p.128.

⁸⁵ Ibid.

1. First, there is not a constant specific structure of relations, because actants hold new relations as they change and adapt. These new relations can be the inclusion of new elements or the reconfigurations of existing elements⁸⁶.
2. Second, relations in the Fluid topology “change bit by bit rather than all at once, to prevent loss of shape-continuity, rupture, and the loss of identity”⁸⁷.
3. Third, no rigid boundary can be enacted around a Fluid object instead there can be mobile boundaries.⁸⁸

2.5.3 Intersections between the different types of objects in real life

Highlighting the distinguished advantages of fluidity, an important question is raised: Does fluidity take it all? And can real objects exist completely in fluid forms? John Law attempted to answer these questions by elaborating intersections between the three different types. Even in a fluid space, Network and Euclidean spaces remain crucial to assure stability, likewise, Network and Euclidean spaces cannot exist without having Fluid objects to assure continuity, resilience, and sustainability to keep pace with the arising changes. Thus “successful objects are topologically multiple, existing as intersections or interferences between different spaces including Euclideans, Networks, and Fluids”.⁸⁹

2.5.4 Deficiencies of the ANT theory

Even though the ANT theory has dwelled in the nature of the objects, actants, and their relations to better understand the various components and influences of an assemblage, the ANT theory has some gaps that were not covered within its ties. The ANT theory rejects the dualism of the physical materialistic side, and the social, political, and cultural one, where it treats the non-human actants as if they had the same properties as human actors. The ANT theory equates between material actants and human actants to a great extent—as for the ANT theory they are all actors in a certain assemblage—not showing the different capacities of each, and how the human being has the greater influence over the matter. This has led to misrepresentation of each actant’s capacity and a denial that the human factor has the greater domination over objects through its social realm that the ANT theory does not dwell into. In the end, an object would not have been one without the social drivers that called for its existence due to a social need that developed out of the advancement of society. Not only that, but

⁸⁶ Law, (2002), Objects and spaces, p.98.

⁸⁷ Ibid, p.99.

⁸⁸ Ibid.

⁸⁹ Ibid, p.102.

existing objects (even if they are fully functional with the presence of all the needed actants and relations) can also diminish when there is not a social need for them anymore, they lost the attributed social meaning maybe by developing other objects that took their roles or just by the satisfaction of the social need. All in all, the Actor-Network theory ignores the human social agency with the social forces, and thus disregards the dualistic nature of the world, that there exists a materialistic side and a social, cultural, and political one that shapes and affects the physical objects.⁹⁰

In an attempt to cover the gaps of the ANT theory, a theory and an approach are used to tackle these gaps and complement the ANT theory, in order to create an overall approach that can be used for analyzing markets and generating a framework for their development.

2.6. The SMTT and non-SMTT Systems Approach

The SMTT and non-SMTT systems approach is added to complement the ANT theory covering its gap, as it taps on the dual nature of the world distinguishing between the materialistic systems and the social ones. It is based on analyzing any type of object by looking into its various type of systems in a classified manner and noticing their different impact on each other. The approach, as part of being dualistic, creates two folds of classification that any type of system can fall under, the (physical materialistic) SMTT system and the (social) non-SMTT systems. SMTT systems are the ones that have the following qualities: being *Specific*, *Measurable*, *Tangible*, and *Timely*. Any system, that has *specific tangible* elements and components that are organized for a common purpose in a specific *time* duration and can be practically *measured*, is a SMTT type of system. Whereas non-SMTT Systems are the ones that are intangible, unspecific, nonphysical, and cannot be measured within a given time. These systems cannot acquire the four traits of the SMTT systems due to their specific nature, however, these systems—though may seem nonphysical—are powerful enough to shape and affect the SMTT systems. This approach is added to complement the ANT theory since it lays a considerable amount of attention to the social non-SMTT systems as they are forces and drivers to the SMTT systems formation and development.

Any object through the lens of the SMTT and the non-SMTT approach is a system of systems, and in order to understand the dynamics of this object classifying its internal systems

⁹⁰ Elder-Vass, D. (2015). Disassembling Actor-Network theory. *Philosophy of the Social Sciences*, 45(1), 100–121. <https://doi.org/10.1177/0048393114525858>

and detangling them is a must. Applying this approach on the market, as an object having internal systems, it is found that the SMTT systems include the following:

- Economic systems.
- Goods production, distribution, and supply systems.
- Energy generation and supply systems.
- Water supply and treatment systems.
- Waste generation and treatment systems.
- Transport and mobility systems.
- Communication systems.
- Urban fabric including hardscape, softscape, and lighting systems.
- Built systems.

These systems can be practically measured in terms of their production and consumption, each with a unit suiting its nature, for example, energy can be measured in kWh, water in m³...etc. Furthermore, all systems can be measured by the amount of carbon emissions produced, known as the *Carbon Footprints*⁹¹.

On the other hand, the non-SMTT Systems are represented in the following:

- Social systems: the constructed social connections and ties within the physical place that develops a sense of community and self-agency, it can also be known as the community system.
- Culture and identity.
- Political systems.

Notably, this approach stresses on studying how the different systems interlace affecting each other in any given object and it does not dictate a certain methodology for studying these systems, rather it only accentuates the importance of their examination regardless of the methodology. That is why it is necessary to tap on a theory that presents a method to study these systems, examine their evolution and investigate how the non-SMTT systems, namely the social, cultural, and political systems, are translated into the SMTT systems in a way that affects and shapes their form.

⁹¹ McMorrow, D. (2011). Methods for remote determination of CO₂ emissions. *Office of Research & Development for National Security, Federation of American Scientists*. Retrieved on 16 March 2021 from: <https://fas.org/irp/agency/dod/jason/emissions.pdf>

2.7. The Marxist Theory of Production

The Marxist theory of production complements the ANT theory and the SMTT systems approach as it taps upon the conception of the human social nature with respect to the world as the main lens for investigating how all other materialistic systems evolved, developed, and are currently being shaped. The Marxist theory of production also presents a method for studying the different systems, examining their evolution, and investigating how the non-SMTT systems, namely the social, cultural, and political systems, are translated into the SMTT systems in a way that affects and shapes their form.

Marx and Engels, the founders of the Marxist theory of production, claimed that humans were distinctive from other living species by producing their means of subsistence, whereas other thinkers attributed this distinction to the human ability to reason. For Marx and Engels, men and women were different when they started to “act productively on the world to consciously transform it to meet their needs”, this act of production was in essence “a form of social practice” that required language to enable it⁹². This language was the language of materialistic life, meaning that the conceptual act of production was intertwined with “the material activity and the material intercourse of men”⁹³. From here, we notice that the non-SMTT and the SMTT systems began to evolve interwoven together as a result of the social need for production, but only with the social and the material aspect as a historical start. Later on, they developed to have cultural, economic, political, physical, and ecological aspects. This system development stemmed from the fact that the social act of production met the human

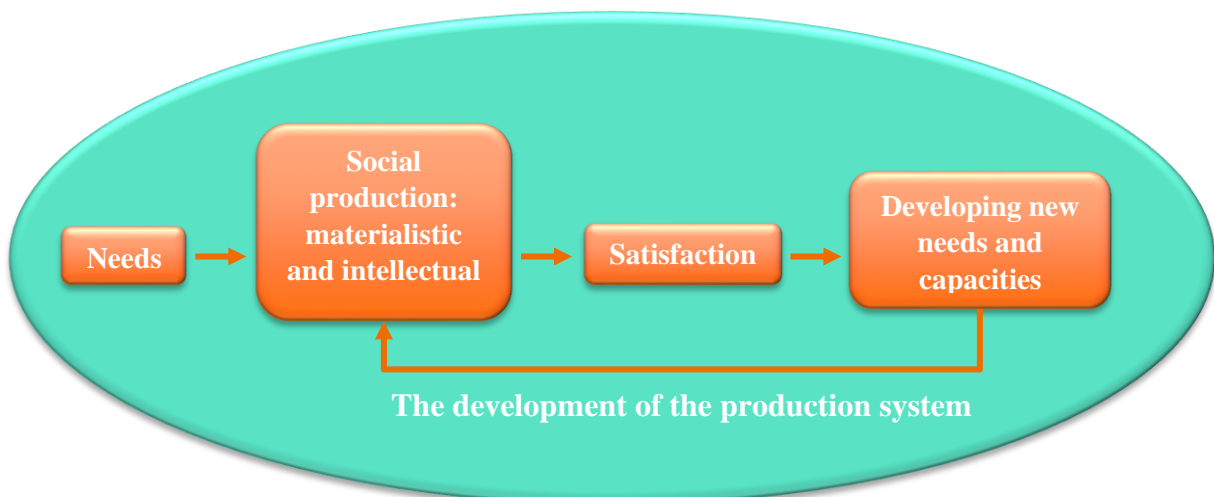


Figure 29- The Development of the Production System, (Author's Illustration)

⁹² Blackledge, P. (2006). *Reflections on the Marxist theory of history*. Manchester University Press. Retrieved from: <http://ebookcentral.proquest.com>

⁹³ Ibid.

needs and also developed new needs and capacities that would push humans to recreate themselves. This process can be illustrated in the above figure (29).⁹⁴

2.7.1. Marxist scientific method to investigate the nature of social production for understanding its systems

Marx developed a method to enquire into the nature of production in order to understand its various systems and components more deeply. As Marx explains, this method looks at the social totality of the production system, and it dissects it into components, determinants, and relations. Only then, the system can be reconstructed or developed by determining and analyzing its many constituents. Here the Marxists’ scientific method shares with the ANT theory a common analytical lens, where they both tend to look at the basic actants, relations, and determinations of the totality of the objects to understand how to reconstruct it or develop it, except that the Marxist theory attributes the totality to have social drivers.⁹⁵

Looking into the social totality of production necessitates knowing the elements and relations of production that distinguish several epochs of production over time. The elements of production are recognized generally as production, distribution, exchange, and consumption systems, falling under the SMTT systems. These elements—also considered as systems—and the relations between them vary from one era to another, due to the presence of different social, political, and historical processes, represented in the non-SMTT systems, and they are predominated by the production as illustrated in figure (30).⁹⁶

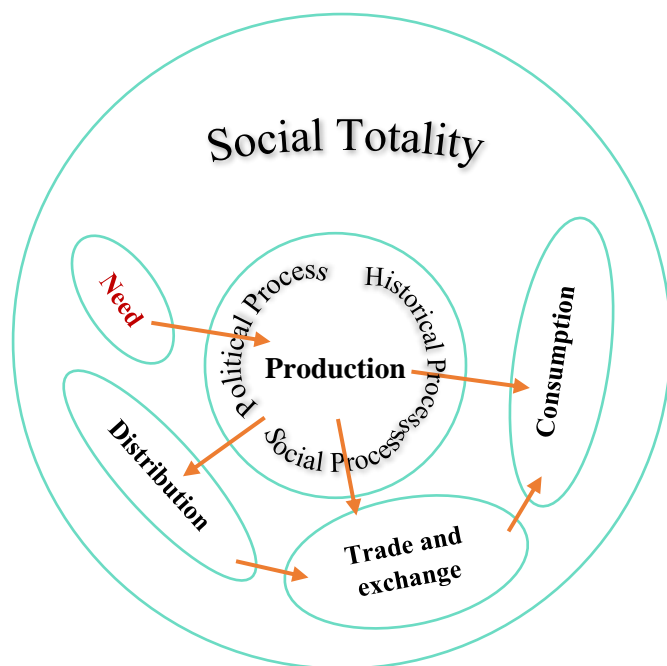


Figure 30- The Elements of Production and Their Relationships
(Author’s Illustration)

⁹⁴ Blackledge, (2006), Reflections on the Marxist theory of history, p.32.

⁹⁵ Ibid.

⁹⁶ Ibid.

2.7.2. Marxist mode of production: forces and relation of production

According to the Marxist theory, the relations between the elements of production, or in other terms *the relations of production* dictate a certain mode of production. In the Marxist etiology, relations of production stem from the technical relations of production and the social relations of production. Technical relations are those constructed between humans and objects in the physical dimension, those objects are called *means of labor* or *means of production*. On the other hand, the social relations of production are the social relationships that people have to construct to produce, reproduce and survive, participation in these social relationships is not voluntary. The totality of the technical and social relationships creates a relatively steady and stable structure, known as the mode of production.⁹⁷

The mode of production is also comprised of forces of production, which are drivers for production. Forces of production when translated into systems, would appear as the non-SMTT type of systems, the ones that have social, cultural, and political forces that would direct the production into a certain direction, creating a certain mode of production and reflecting on the physical SMTT systems. As illustrated in figure (31), when the forces of production change along with the relations of production, a certain mode of production is created over time. Thereof, Marx divided history into several modes of production, “each of which he understood as a distinct articulation of forces, elements, and relations of production”⁹⁸. Marxist historians have also previewed the different modes of production as “distinct totalities and dynamic systems that are related to each other across space and time”⁹⁹. Some examples of modes of production over time can be found in slavery modes of production, feudalism, capitalism, and post-capitalism modes of production.¹⁰⁰

2.7.3. Hidden relations of production, commercialization, and social dependency

With the rise of commercialization, some relations of production became obscured. Nowadays, the market has become a place where people will purchase goods and commodities without knowing who made them and where. They know that there is a social dependency on the producers objectively since they rely on their production to satisfy their needs, however, they do not know who the producers are specifically. Here the commercial relationships, as shown in the below figures (31) and (32), have mediated between some social and technical

⁹⁷ Blackledge, (2006), Reflections on the Marxist theory of history, p.35.

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

relations, where the technical relations of people with nature and the social relations between people have been turned into a commercial relationship between things: goods, money, and capital. This has led to proliferating the relationships between tradeable things. Not only that, but these commercial relations have also started to regulate and control the human pattern of contact and technique.¹⁰¹

That means that these commercial relationships have a role in affecting the SMTT systems and particularly the urban setting. Mutually, the urban setting and the city urban planning affect these commercial relations and if organized properly can be a key driver for sustainable development. For example, in the plastics industry, the commercial relationship between the producer, the distributor, and the seller is reflected on the production site, the transportation acts going back and forth carrying the plastic goods, the distribution activity to the merchants, and the crowd selling activity that constitutes certain space and time that is governed by the social and political forces. All these processes and activities resulting from the

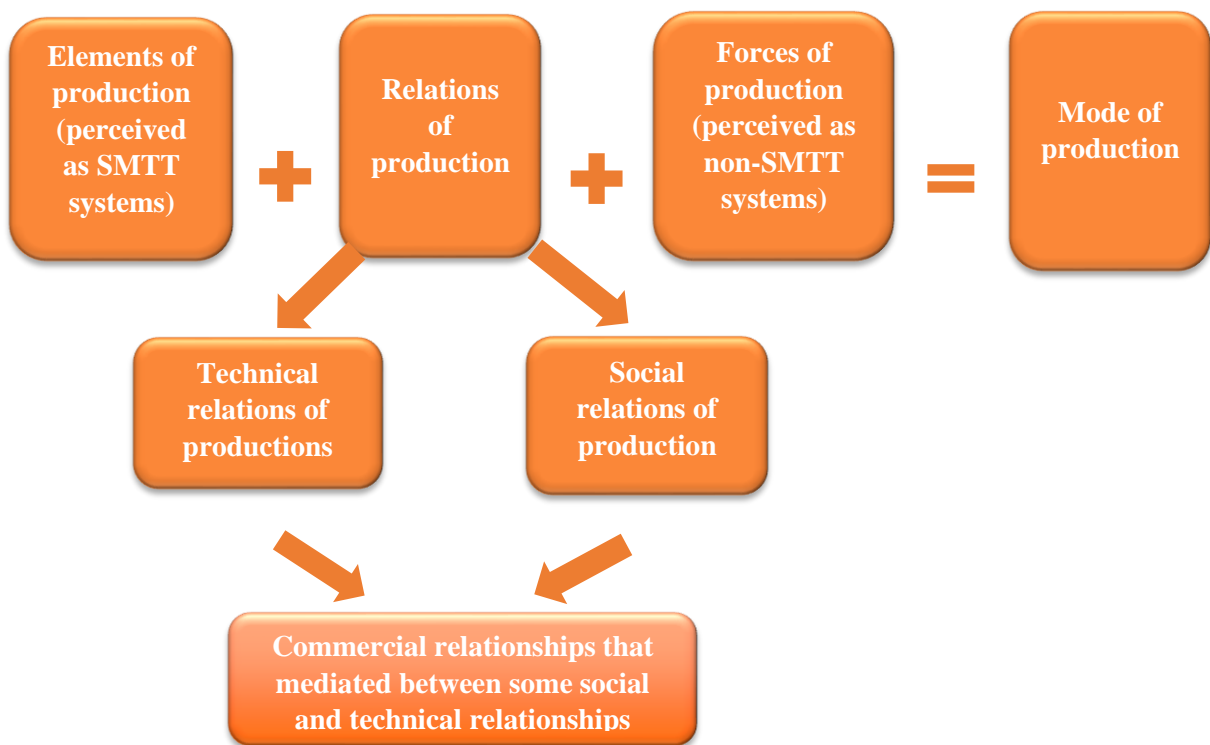


Figure 31- The Components of the Mode of Production (Author's Illustration)

¹⁰¹ McMurtry, J. (2015). *Structure of Marx's world-view*. Princeton University Press, 76-80; Morrow, R. (1986). [Review of *In the Tracks of Historical Materialism*, by P. Anderson]. *The Canadian Journal of Sociology / Cahiers Canadiens de Sociologie*, 11(4), 469-473. <https://doi.org/10.2307/3341062>; Rockenbach, B., Gintis, H., Bowles, S., Boyd, R., & Fehr, E. (2007). Moral sentiments and material interests—The foundations of cooperation in economic life. *Journal of Economics*, 90(2), 215-218. Retrieved from: <https://doi.org/10.1007/s00712-006-0236-0>; Therborn, G. (1976). *Science, class, and society: On the formation of sociology and historical materialism*. NLB, 88-119.

commercial relationship help create an urban setting with certain traits. Reciprocally, that created urban setting along with the generated SMTT systems fosters certain types of commercial relationships that carry within its ties hidden social and technical relationships.

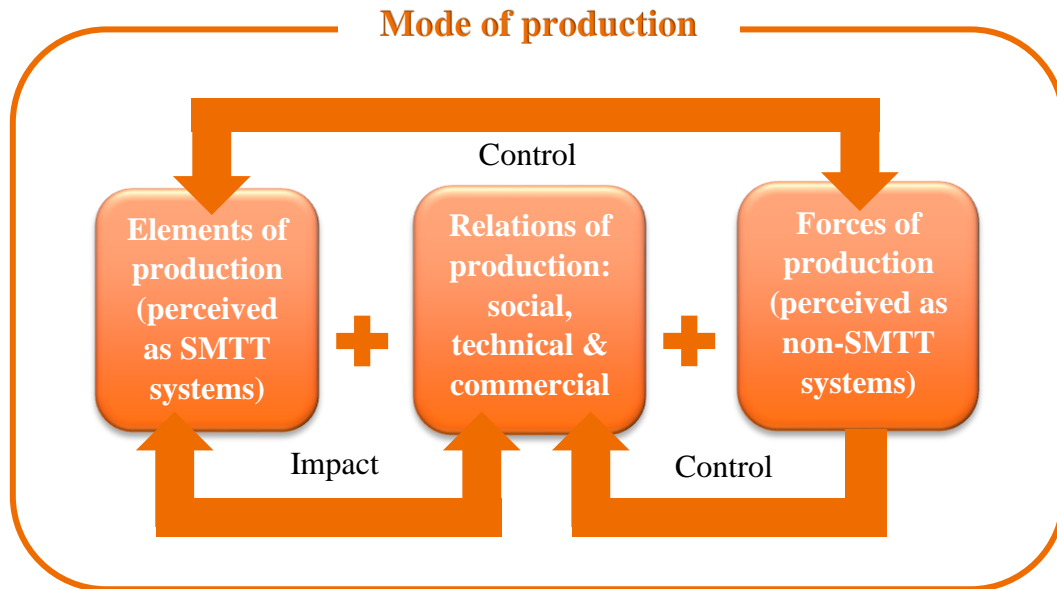


Figure 32- The Mode of Production, (Author's Illustration)

All in all, the Marxist theory of production presents a demonstration of the dualistic world of humans and matter complementing the ANT theory and providing a methodology that studies the evolution of the systems and examines how the non-SMTT systems affect and shape the SMTT systems in a certain mode of production.

2.8. Conclusion

In conclusion, this chapter discussed how public markets evolved since early civilization and developed across history moving from the twelfth century up to the current time. In the process of development, public markets moved from farms and charters to large-scale marketplaces with fixed and semi-fixed shops that progressively led to the appearance of fairs. With the advancement of technology in the eighteenth century, markets tended to be more specialized and wholesale with the rise of department stores that catered for mass production at its time. Moving forward with the rise of capitalization and the development of chain stores in the twentieth century, public markets witnessed a noticeable decline and became more of free markets, however, retaining culture and heritage, and preserving the distinguished experience that differentiates them from the controlled environment of hyper places and department stores. Public markets were also remarked to hold freedom of institutional control, thus giving room for small and medium businesses to offer cheaper goods to the lower and

middle classes of public consumers. Moreover, markets in urban centers were distinguished to offer a wide range of commodities and services thus meeting the public demands unlike other forms of shopping and retailing. These distinct features as well as the centrality of public markets inside the cities were the main drivers for the markets' existence up to the current time.¹⁰²

Nowadays markets in our contemporary city may seem modern, but still, some medieval features exist under disguise. Addressing the evolution of markets across time has revealed these medieval features in their current modern form and the systems that developed over time to supply certain demands in the societies. This provided a better understanding of how the market reached its current functions, components, relations, and systems tied by the surrounding context and the demand of public consumers. Addressing the growth of markets also clarified the evolution of the different social, economic, political, and regulatory systems that have developed over time inside the market, marking the market as a system of different objects working together in integration thereof tapping on the theories that address this issue.

The chapter briefly examined the two main theories that speak about the system composition, components, and actants: the Actor-Network Theory, the ANT, and the Assemblage theory. The chapter picked the ANT theory as the main analytical lens, as it is the only theory that taps on all types of topologies: Network, Euclidean, and Fluid, unlike the Assemblage theory which is based on only fluidity, exchangeability, and multiple functionalities¹⁰³. Relations in the ANT can be direct, indirect, unidirectional, and bidirectional between the different actants. Moreover, the relations can be permanent or temporary depending on the permanence or temporariness of the actants that they are associated with. The chapter then explained the different types of objects: Network, Euclidean, and Fluid objects in relation to their spatial topologies, marking the Fluid object to create the most spatially resilient topology, thus the most sustainable space. Networks and Euclidean also assure stability of the object, that is why a successful object is “topologically multiple, existing as intersections between the different spaces: Euclidean, Networks, and Fluids”¹⁰⁴. Working to demonstrate the different aspects of the ANT, the chapter concluded the theory by showing its deficiencies that comprised ignoring the human social agency with the social forces, and disregarding the

¹⁰² Caramaschi, (2014), Public markets; Casson & Lee, (2011), The origin and development of markets; Costa et al., (2015), Urban markets.

¹⁰³ Buchanan, (2015), Assemblage theory and its discontents.

¹⁰⁴ Law, (2002), Objects and spaces, p.102.

dualistic nature of the world, that there exists a materialistic side and a social, cultural, and political one that shapes and affects the physical objects.¹⁰⁵

Attempting to cover the ANT gaps, the chapter used the SMTT systems approach and the Marxist theory of production. The SMTT systems approach necessitates classifying the internal systems of any object into physical materialistic SMTT systems and social non-SMTT systems in order to understand its dualistic dynamics and examine how the non-SMTT systems affect and shape the other type of systems. The approach did not dictate a certain methodology for studying the systems, something that the Marxist theory came to cover. The Marxist theory of production offered a method that studies how the different systems evolved tapping on the social totality of production. This method studies the different systems, examines their evolution, and investigates how the non-SMTT systems, namely the social, cultural, and political systems, are translated into the SMTT systems in a way that affects and shapes their form. The Marxist theory also dissects the social totality of production into elements, relations, and forces of production. The elements of production include production, distribution, trade, and consumption, and they fall under the SMTT systems. The relations of production span between the technical, social, and commercial relations, whereas the forces of production are the social drivers that call for a certain type of production falling under the non-SMTT type of systems. Lastly, the chapter showed how a certain mode of production is created over time with the change of the forces of production along with the elements and relations of production. All in all, the Marxist theory of production presented a demonstration of the dualistic world of humans and matter complementing the ANT theory and providing a methodology that studies the evolution of the systems and examines how the non-SMTT systems affect and shape the SMTT systems in a certain mode of production.¹⁰⁶

¹⁰⁵ Elder-Vass, (2015), *Disassembling Actor-Network theory*; Farías et al., (2010;2009;2012), *Urban assemblages*; Kärrholm et al., (2014), *Spatial resilience and urban planning*; Law, (2002), *Objects, and spaces*, p.100.; Shoaib, (2015), *Highway urban assemblage*.

¹⁰⁶ Blackledge, (2006), *Reflections on the Marxist theory of history*, p.30.

Chapter 3: Creating the Development Framework

3.1. Introduction

Having explained the theories and approaches in the former chapter that can help determine the dynamic components, actants, and relations of any object without ignoring the dualistic nature of the systems, this chapter moves forward to develop a general framework for analyzing public markets and developing them in integration with their zone of influence revitalization. The chapter starts by demonstrating the used methodology for constructing an analytical schema for analyzing the dynamic components of public markets. The chapter then constructs the analytical schema that is based on the ANT theory determining the main functions that public markets should be performing, then breaking down these functions into qualitative components, factors, actants, and relations. After that, the chapter adds another analytical lens based on the Marxist theory and the SMTT systems approach to complement the main schema. This complementary analytical lens addresses how the human aspect has the greater influence over the whole object, *the market*, and how the human aspect can be classified into its own systems, the non-SMTT systems, still affecting the other non-human systems, the SMTT systems, in the mode of production model. After completing the analytical lens, the chapter determines how the main guidelines can be proposed for the market's development in integration with their zone of influence revitalization.

3.2. The Used Methodology for Building the Analytical Schema

For constructing an analytical lens (general schema) for analyzing public markets and developing them in integration with their zone of influence revitalization, a primary qualitative methodology has been used. This methodology has been based on paying 14 field study visits to seven different Cairene markets¹⁰⁷, where five visits have been paid to Souq Al-Sayyida 'Aisha, and Souq El-Itneen (in spring 2020 afternoon to sunset for both Souqs), four visits have been paid to Souq Al-Tunsi, and Souq Al- Jum'a (two visits in spring 2020 and two visits in fall 2020 from morning to sunset for both Souqs) and five visits have been paid to Al-Azhar street, Souq Al-'Ataba, and Khan Al-Khalili (five visits in spring 2020 from morning to evening time for all Souqs). The 14 field study visits included conducting observations and

¹⁰⁷ The researcher has conducted primary research on markets in Cairo city only, not greater Cairo.

interviews with 20 merchants, 5 **auxiliary workers**,¹⁰⁸ and 11 customers as illustrated in the below table (3):

Table 3- The Number of Interviewees in Each Souq

The name of the Souq and the type of the interviewee	Souq Al-Sayyida 'Aisha	Souq El-Itneen	Souq Al-Tunsi	Souq Al-Jum'a	Al-Azhar street	Souq Al-'Ataba	Khan Al-Khalili
Merchants	3	2	4	3	3	2	3
Auxiliary workers	-	-	2	-	2	1	-
Customers	2	1	2	2	-	2	2

The interviews have been based on structured questionnaires that can be found in appendix C, and the data obtained from the interviews and the observations have been analyzed using a thematic analysis that was based on classifying the data into definite themes that included the following:

- The different types of spaces used for offering a wide range of objects and the impact of their composition and nature on the exchange process and the surrounding context.
- The dynamics of the goods distribution and supply systems and their reflection on the traffic inside and outside the market.
- The nature and frequency of the work of the merchants and the auxiliary workers, and how that reflect on the exchange process.
- The persona of the customers and the frequency of their visits to the market.
- The impact of the positioning, reachability, accessibility, internal circulation, and mobility of the market on itself and the surrounding context.
- The management of the market, including its operations, maintenance, regulation, security, enforcement of environmental and public health safety requirements, cleanliness, and facility management.
- The state of the existing infrastructure and urban fabric, and how that contributes to the functioning/malfunctioning of the market and its zone of influence.

¹⁰⁸ Auxiliary workers include all workers who facilitate the exchange process for the merchants and the customers such as: car drivers for transporting the goods to the customer's homes, baggers for carrying the goods, and technicians who can assemble and disassemble the goods like: carpenters, plumbers, ...etc.

- The presence/absence of focal points and landmarks and measuring how they serve to define the whole area and act as navigational aids for achieving better wayfinding for the market and its surrounding areas.
- The presence/absence of active public spaces and their role in achieving areas with urban vitality that attract people, increase safety, and elevate the quality of life by presenting a medium where people can move actively and exchange ideas.
- The presence/absence of a free socially diverse experience inside the market.
- The presence/absence of local employment opportunities and room for small and medium businesses.
- The presence of quality urban life for the market and its surrounding urban spaces.
- The current mode of production and its physical interpretation on the existing objects, and the flow and pattern of people and goods.
- How the potentials of the current mode of production can be tied to the development of markets and the upgrade of the associated zone of influence.

The qualitative methodology used to develop the schema has been complemented with secondary research (that is demonstrated in the body of this chapter) that discusses the centrality of public markets, its relation to the surroundings, its various systems and components, its functioning and performance, its management and urban development, and its role on social connectivity, economic growth, and quality urban life.

3.3. Building the Analytical Schema for Analyzing Public Markets

Using the above methodology and the ANT theory mentioned in chapter 2, the researcher has created a generic lens for analyzing and understanding the public markets' dynamic components in relation. This lens first determines the function that public markets should be performing (as an object), then it breaks down the main functions into subdivided components and factors. After that, it determines the involved actants and how these actants should be in relation to perform the designated function. This analytical lens, expressed in the below table (4), is a general schema that fits all types of markets with no specificity, it has been based on literature studies about markets and their functionality. This schema also comprises a *point system* that acts as *an indicator* only (not a statistical component) for determining generally how much a market is functioning well. The point system depends on having 1 point for the presence of the factor/component or 0 points for its absence, and 1 point for each quality attributed to the factor/component or 0 points for its absence. Thus, it is a yes/no component

based on the availability or the absence of the factors/components/attributed qualities. The scholar/interested audience should be giving points to each present component/factor/attributed quality, then he/she should be calculating the total number of points given to the market under study divided by the overall number of points multiplied by 100 to get a percentage. This percentage provides an indicator of how much the market under study is functioning well. Apart from examining existing markets using the schema for developing them, this schema can be also used as a guide for building new markets.

The public markets schema lists the main functions that any market should be performing as part of being the heart of the city that is central for growth, exchange, and supply¹⁰⁹. The main functions comprise exchange, urban growth and regeneration, an engine for community life, fostering economic development, and creating quality urban life¹¹⁰. Each function is broken down into a list of qualitative components, factors, actants, and relations that affect the performance of the function. Since the schema tries to draw for the main function a successful outline of components and factors, thus, it determines some detailed qualities for each that will potentially make the market a more sustainable place. After determining the quality of each component and factor, the schema lists the actants that should be present for the function to be performed. *The actants in the schema* denote sole or collective agents who act in relation to other actants to fulfill the desired function¹¹¹. These agents can be both human and non-human entities (even if the whole framework will be designed to accommodate for dualism) just to show the importance of the non-human elements and their relative impact in delivering the function (this does not oppose the fact that the framework acknowledges the different capacities of human and non-human agents, and this shall be further explained in applying the Marxist theory in the development framework)¹¹². The actants are then shown in relation to each other in sequential diagrams shown in table (4).

An elaboration for the five main functions with their breakdown of components, factors, actants, and relations is illustrated below.

¹⁰⁹ Costa et al., (2015), Urban markets.

¹¹⁰ Ibid.

¹¹¹ Farías et al., (2012), Urban assemblages

¹¹² Farías et al., (2012), Urban assemblages; Shoaib, (2015), Highway Urban Assemblage.

3.3.1. Exchange

The first main function that a market should be delivering is the process of selling and buying, in other words, the process of exchange ¹¹³. This process has different factors that if are achieved to a great extent would result in a successful exchange. First, exchange depends on the presence of a wide range of commodities and services that are offered to different classes at competitive prices for the aim of attracting a wide segment of customers and making the market more teemed and profitable.¹¹⁴ The presence of a wide range of commodities and services necessitates the presence of:

1. Selling objects, such as shops, stalls, booths, and selds, that contain sustainable, attractive, and organized display space, secure, climate-controlled, and pest-free storage spaces, and exchange spaces. The presence of selling objects is one of the core components that make the exchange process attainable since they make the market spatially defined. Selling objects draw the spaces where merchants and customers will be interacting together for selling and buying, and they provide spaces for keeping the objects safely and displaying them for grabbing the attention of the customers. Selling objects in the market should be made of sustainable resilient materials and design to accommodate for a high spatial resilient space with low carbon emissions.¹¹⁵

The needed actants¹¹⁶ and their relationships, for the selling objects, are manifested as follows:

1. The *merchants* display the goods in a *display space* that is characterized to be sustainable, attractive, and organized.
 2. The *storage* provides a secure, climate-controlled, and pest-free space for the *merchants* to store excess *goods*.
 3. The *merchants* can buy and sell in the *exchange space*.
 4. The *market regulators* regulate the type and location of the *storage* and the *display space* as well as supervise and monitor the *merchants*.
2. Distribution and supply systems. These systems include short efficient supply chains of commodities from the factories and the workshops to the distributors then to the

¹¹³ Casson & Lee, (2011), The Origin and development of markets.

¹¹⁴ Visconti, L. M., Minowa, Y., & Maclaran, P. (2014). Public markets: An ecological perspective on sustainability as a megatrend. *Journal of Macromarketing*, 34(3), 349–368. Retrieved on 14 Jan 2021 from: <https://doi.org/10.1177/0276146714525201>

¹¹⁵ Visconti et al., (2014), Public markets; Wirtz, J. (2018). Winning in service markets: Crafting the service environment. *World Scientific*, 8, 24. Retrieved 8 December 2020 from:

https://www.researchgate.net/figure/Design-Elements-of-A-Retail-Store-Environment_tb11_319350454

¹¹⁶ Note: actants are shown in italics in all the coming lists of actants and their relationships.

warehouses or directly from the distributors to the shops, and proper handling of goods inside the market to reach the selling objects. Short efficient supply chains and proper circulation of goods are critical to the exchange process as they are responsible for the delivery of goods to the marketplace in a quick regular manner that is more sustainable than long supply chains. Proper handling of goods inside the market to reach the selling objects is also very crucial to be considered in any market for the success of the exchange process, that is because if it is poorly managed it can lead to the damage of the goods before reaching to the selling objects, accidents, or injuries for the people in the market, and it can create traffic inside the market.¹¹⁷ The needed actants and their relationships, for short efficient supply chains and proper handling of goods, are illustrated as follows:

1. *Factories, workshops, or neighborhoods* (in case of reused goods) supply the *merchants* with goods and commodities indirectly by having the *distributors* as mediating agents who work on collecting the goods from *factories, workshops, or neighborhoods*.
 2. The *distributors* distribute the goods to the *merchants*, or they deposit them in a *warehouse* where the *merchants* can fetch the *goods* from.
 3. The *market service lanes* provide an unloading and transportation space for *the merchants* to deliver the *goods* to the *shops*.
 4. The *market regulators* supervise and control what enters the *shops* through the *market service lanes* and when.
3. Customers, merchants, and auxiliary workers who show frequent presence in the markets' working hours and conduct exchange acts. The human component in the market who is responsible for the exchange process is by far the most important object affecting the whole exchange process. This human component includes the customers (a wide range of segments, including men, women, children, elderly and disabled), merchants, and auxiliary workers such as car drivers for transporting the goods to the customer's homes, baggers for carrying the goods, and technicians who can assemble and disassemble the goods like carpenters, plumbers, ...etc. There's a need for visiting the market on a regular basis from the customers' side so that the exchange process can

¹¹⁷ Chao, E. & Henshaw, J. Materials Handling and Storage. (n.d.). *United States Department of Labor, Occupational Safety and Health Administration*. Retrieved on Jan 14, 2021, from: <https://www.osha.gov/Publications/OSHA2236/osha2236.html>; Zhang, X., Qing, P. & Yu, X. (2019). Short supply chain participation and market performance for vegetable farmers in China. *Australian Journal of Agricultural and Resource Economics*, 63, 282-306. <https://doi.org/10.1111/1467-8489.12299>

occur between them and the merchants. For this to be attainable, merchants and auxiliary workers should show frequent presence inside the market (in the market's working hours) and perform the exchange process with the customers. The act of buying and selling will in return ensure that the merchants and auxiliary workers gain profitable income that would keep them keen on showing presence in the market.¹¹⁸ In this case, the needed actants and their relationships are manifested as follows:

1. The *market regulators* supervise and monitor the presence of the *merchants and workers* in the working hours of the market.
2. The *merchants and workers* sell goods to the *customers*.
3. The exchange acts generate *profit*, and in return, *profit* provides a constant income for the *merchants and workers*.

The process of exchange also depends on other factors, other than the presence of commodities, such as the positioning and reachability of the market. The market's positioning and reachability are significant to the exchange process as they control who can reach the market and how, thus if they are employed well, they can be a reason for augmenting the number of customers thus increasing the profitability and popularity of the market. The good positioning of a certain market is tied to the situation of the market near to the customers' residence, the merchants' and workers' residence, public transport facilities, commercial facilities, and social facilities. Meanwhile, the reachability of the market can be better achieved by linking the market to the surrounding districts' main axes.¹¹⁹ The needed actants and their relationships, for the positioning and reachability factors, are shown as follows:

1. *Mobility planners* and *traffic officers* in coordination with the *government* study the *market* in order to make it more reachable (indirectly) by establishing *road links* and conducting proper *traffic management*.
2. *Road links* connect the *Market* in an efficient way to the *districts' main axis*, *public transport facilities*, *commercial and social facilities*.
3. *Public transport facilities* transport *customers*, *merchants*, and *auxiliary workers* from their communities to the *market*.

¹¹⁸ Graber, S. (2013). Reassessing the merchants' role in a globalized economy. *International Development Policy*, 4.2(1), 153-193. Retrieved on Jan 14, 2021, from: <https://doi.org/10.4000/poldev.1636>

¹¹⁹ Tracey-White, J. (1999). *Market infrastructure planning, a guide for decision-makers*. FAO. Retrieved from: <http://www.fao.org/3/x4026e/x4026e06.htm#bm06>; Tracey-White, J. (2003). *Planning and designing rural markets*. FAO. Retrieved from: <http://www.fao.org/3/y4851e00.htm#Contents>

Not only does positioning and reachability plays a huge role in achieving the exchange process, but also accessibility, smooth internal circulation, and mobility have their notable impact. If the market has poor accessibility, that will affect the number of customers entering it, likewise, if the market has poor internal circulation and mobility, the customers will not be able to reach all stalls and shops, thus the whole exchange process will be negatively affected, and the market will not be profitable. Good accessibility dictates having clearly defined access points and easy access for deliveries to the market without facing any obstacles, on the other hand, smooth internal circulation and mobility demand having a good network of passages and local streets connecting to all stalls and shops.¹²⁰ The needed actants and their relationships, for accessibility, smooth internal circulation, and mobility factors, are shown as follows:

1. *Market regulators* regulate and control the opening and closure of the *access points for users and goods*.
2. *Access points for users* link the users to the *internal passages*, which in turn connects the users to the *shops and stalls*.
3. *Access points for goods* lead the goods to *service lanes*, which in turn allow the goods to reach the *unloading decks* to be carried to the *shops and stalls*.

Aside from the positioning and reachability of the market, the average built-up density of the market plays an important role in making the exchange process more lucrative. The built-up density, if not controlled in the market, results in a poor exchange process. That is because if the market is overly dense, there will be no room for proper display and exchange, and there will be a high tendency for theft and poor public health. On the contrary, if the market is less dense it will be less profitable, as there will be fewer customers. Therefore, an average built-up density is the best option for having a good number of customers and an adequate space for display and exchange. An average built-up density can be achieved by having a form that compromises between compactness and uncrowdedness.¹²¹ The needed actants and their relationships, for having an average urban density, are elaborated in the following:

¹²⁰ Tracey-White, (1999), Market infrastructure planning.

¹²¹ Dave, S. (2010). High urban densities in developing countries: A sustainable solution? *Built Environment*, 36(1), 9-27. Retrieved December 8, 2020, from <http://www.jstor.org/stable/23289981>; Raines, F. (2000). Playing from strength: The market power of cities. *The Brookings Institution*. Retrieved on 14 Jan 2021 from: <https://www.brookings.edu/articles/playing-from-strength-the-market-power-of-cities/>

1. *Urban designers* in coordination with the *market management body*¹²², *merchants*, and *involved users* collaborate together in a participatory design or redesign for the *built-up form* to achieve an average built-up density.

Beside all the mentioned factors, the process of exchange, like any type of process, demands proper management to be appropriately realized. The lack of management or the presence of poor management can lead to failure or malfunctioning of any object including the market. That is why it is necessary to have good management for proper functioning. Management of the market includes the presence of permanent stable operations and continuous maintenance. Permanent stable operations of the market consist of administration and record-keeping, and application of market rules and regulations. Market rules and regulations include: keeping stable working hours of the market, applying renting and shop-allocation policies, taxes and fees collection, traffic and security regulation, enforcement of food safety, environmental and public health requirements, hygiene control and product inspection, and keeping public order.¹²³ The needed actants and their relationships, for permanent stable operations, are illustrated as follows:

1. *The market management body* manages and supervises the *market regulators and operators*.
2. *Market regulators and operators* ensure food safety, hygiene control, and product inspection for *goods*.
3. *Market regulators and operators* apply rental and stall allocation policies for *shops and stalls*.
4. *Market regulators and operators* ensure stable working hours, order, security, traffic control, and enforcement of environmental requirements inside the *whole market*.
5. *Market regulators and operators* collect fees and taxes from *merchants and auxiliary workers* and keep public health for them and for *customers*.

Continuous maintenance, as part of good management, is an important factor for keeping the exchange process inside the market. Continuous maintenance of the market includes recurrent cleaning and improvement of facilities and used objects inside the market. If continuous maintenance is not done frequently, it can affect the functioning of the objects, that is because objects decay over time, and some actants need to be fixed or replaced.

¹²² The market management body can be communal (community leaders operating and managing the market), governmental (local municipality/any other associated governmental body), or private sector based, depending on the nature of each market, its policies, owners, and controllers.

¹²³ Tracey-White, (1999), Market infrastructure planning.

Furthermore, if objects are not well maintained and cleaned, that will result in an accumulation of waste leading to environmental problems and hazards.¹²⁴ The needed actants and their relationships, for continuous maintenance, are elaborated in the following:

1. *The market management body* sources and supervises the *cleaning and maintenance body*, which in return works on cleaning and maintaining the *market*.

The last factor that impacts the exchange process inside the market is the attractiveness of the market. A market that is not attractive, will not pull a huge number of customers, and people will go there out of a need not out of a desire of spending time in the market. Whereas an attractive market with lots of seduction will be more appealing to customers, and the exchange process will not only be a necessity, but rather a social leisure activity. A market can be attractive by the presence of engagement techniques, seductive elements, sensory temptations, entertainment features, and interesting facades.¹²⁵ The needed actants and their relationships, for the market's attractiveness, are shown as follows:

1. *The market management body* arranges with the *local municipality* for hiring *architects and contractors*.
2. *Architects and contractors* work on designing engaging seductive elements and entertaining features inside the *market* and work on redesigning the facades of the *surrounding buildings*.

3.3.2. Urban growth and regeneration

Known as the central heart of the city, the market's main functions span beyond exchange to cover urban growth and regeneration. A successful market can stimulate the dynamism of their *zone of influence*¹²⁶ inside the city by being a mean to physically transform them. Successful markets have the leading role in enhancing the urban landscape because they are a series of built and open spaces that host interaction between various segments in the neighborhood. Therefore, they can influence the surrounding context by changing the flow and pattern of people, goods, and traffic, and bring within their ties "an essential set of annexed services"¹²⁷. Developing the markets when considered within the policies of the city's urban planning can lead to the creation of public goods: "they could be an answer to the need of

¹²⁴ Tracey-White, (1999), Market infrastructure planning.

¹²⁵ Casson & Lee, (2011), The origin and development of markets.

¹²⁶ The zone of influence of the market is the area affected by the market's performance, functioning systems, and components, it can be the surrounding neighborhoods and communities in mega cities and large portions of the city in mini cities, and whole towns in town villages. It can include planned/unplanned, formal/informal areas.

¹²⁷ Costa et al., (2015), Urban markets, p.49.

generation of public spaces and quality of life, preserving historic heritage, creating new poles of tourism attraction or even designing new iconic elements in the city”¹²⁸. All in all, markets are in charge of bringing new dynamism to their zone of influence inside the city.¹²⁹

Urban growth and regeneration, as a function of the market, depend on several components. It entails preserving cultural and historic heritage, integrating communities, developing infrastructure, renovating urban fabric, tourism attraction, creating focal points and landmarks, and creating active public spaces. These components are integral for the market’s functioning, and they impact the zone of influence directly and indirectly according to the nature of each component.¹³⁰

First, preserving cultural and historic heritage plays a vital role in assisting the market to function properly as well as revitalizing its zone of influence. Preserving cultural and historic heritage depends on maintaining the culture that distinguishes the market area, improving the components of the urban space, and ensuring the wellbeing of life in a medium that considers the soundness of the structures. That is why preserving cultural and historic heritage depends on renovating historic monuments and ancient buildings that are inscribed inside the market or surrounding it.¹³¹ The needed actants and their relationships, for preserving the cultural and historic heritage, are elaborated in the following:

- *Ministry of Antiquities* coordinates with *architects, NGOs, and international organizations* who are concerned with preservation for renovating and restoring *historical monuments and ancient buildings*.

Second, integrating urban and rural communities affects urban growth and development for the market and the associated neighborhoods in a way that fosters socio-economic performance. Urban and rural communities both hold complementary assets and the integration between these assets helps achieve economic development. The partnerships between the two kinds of communities can improve the creation of public goods and new economic opportunities. Different key players on the national scale are required to perform that role and the market considered as the central heart of the city has the leading part to enhance and strengthen the connections between the two types of communities. The market can do this

¹²⁸ Costa et al., (2015), Urban markets, p.49.

¹²⁹ Ibid.

¹³⁰ Ibid.

¹³¹ Castanheira, G. & Bragança, L. (2012). Urban renovation of Portuguese historical centres. *Universidade do Minho, Departamento de Engenharia Civil Azurém*. Retrieved from: https://www.researchgate.net/publication/275824478_Urban_Renovation_of_Portuguese_Historical_Centres

connective role by delivering rural goods from rural communities surrounding it and providing stalls for rural merchants.¹³² The needed actants and their relationships, for integrating urban and rural communities, are shown as follows:

1. *The market management body* communicates with *merchants* in the surrounding rural communities and offers stalls for them.

Third, one of the most important components of urban growth and regeneration is developing infrastructure. Infrastructure services, including the provision of water, energy, telecommunications, transport, mobility, and waste disposal, are key components for the proper functioning of the market and its surrounding zone of influence. Moreover, they are central to the urban growth of the market and its associated zone of influence since they stimulate urban development. Developing infrastructure can lead to increasing production, expanding trade, improving environmental conditions, and reducing poverty, and that influence the environment of the market and the surrounding communities consequently.¹³³ Developing infrastructure inside the schema relies on five main pillars:

1. Water supply and treatment systems: this system depends on providing clean water, minimizing freshwater consumption through the use of reductive techniques (like the use of sensors), and recycling used water by employing greywater, treated black water, and harvested rainwater systems¹³⁴. The actants and their relationships, for the water supply and treatment systems, are expressed in the following:
 1. *The water company* provides water supply systems and water recycling systems in the *market*.
 2. *The water company* coordinates with the *market management body* for reducing water consumption inside the *market*.

¹³² OECD. (n.d.). Rural-urban linkages. *Organization for Economic Co-operation and Development*. Retrieved on December 6, 2021, from: <https://www.oecd.org/gov/rural-urban-linkages.htm>

¹³³ Song, Y. (2013). Infrastructure and urban development: Evidence from Chinese cities. *Lincoln Institute for Land Policy*. Retrieved from: <https://www.lincolnst.edu/publications/conference-papers/infrastructure-urban-development>

¹³⁴ Gassie, W., Englehardt, J., Wang, N., Brinkman, J., Garland, P., & Gardinali, T. (2016), Mineralizing urban net-zero water treatment: Phase II field results and design recommendations. *Water Research*, 105. Retrieved From: https://ac-els-cdn-com.libproxy.aucegypt.edu/S0043135416306820/1-s2.0-S0043135416306820-main.pdf?_tid=0f84d62a-0ed5-42d3-ab3b-ea9937f12e4b&acdnat=1543532128_d110096546b4d3668001c96f0da7dfdd; National Renewable Energy. (2015). *Laboratory of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy*. Retrieved from: https://www.energy.gov/sites/prod/files/2017/08/f35/net_zero_new_buildings.pdf

2. Waste generation and treatment systems: this system depends on waste collection, waste reduction, and recycling¹³⁵. The actants and their relationships, for the waste generation and treatment systems, are illustrated as follows:
 1. *Waste management company/informal waste pickers* collect waste from the *market* and recycle it.
 2. *Waste management company* coordinates with the *market management body* for reducing the waste generated.

3. Energy generation and supply systems: this system relies on supplying energy to the market from renewable resources, minimizing the use of fossil fuels, and decreasing the use of energy by reducing the heating and cooling loads (using passive energy-saving techniques), and using energy-efficient appliances and lighting fixtures ¹³⁶. The actants and their relationships, for energy generation and supply systems, are manifested below:
 1. *The energy company* supplies clean energy to the *market* and installs renewable energy systems if applicable.
 2. *The energy company* coordinates with the *market management body* for reducing fossil-fueled energy and using energy-efficient appliances.
 3. *Energy company* coordinates with the *market management body* for hiring *architects and consultants* for employing passive energy techniques inside the *market*.

4. Transport and mobility systems: this system depends on facilitating non-motorized forms of transport like cycling and walking inside the market and integrating public transport to facilitate access to the market while reducing private cars ¹³⁷. The actants and their relationships, for transport and mobility systems, are elaborated below:

¹³⁵ ZWIA. (2018). Zero waste definition. *The Zero Waste International Alliance, ZWIA*. Retrieved on Jan 14, 2021, from: <http://zwia.org/standards/zw-definition/>

¹³⁶ Kang, J.E., Ahn, K. U., Park, C. S., & Schuetze, T. (2015). A case study on passive vs. active strategies for an energy-efficient school building design. *8th Conference of the International Forum on Urbanism (IFoU)*. Retrieved from: https://www.researchgate.net/publication/300250245_A_Case_Study_on_Passive_vs_Active_Strategies_for_an_Energy-Efficient_School_Building_Design; The National Institute of Building Sciences U.S. Department of Energy. (2015). A common definition for zero energy buildings. *U.S. Department of Energy*. Retrieved From: https://www.energy.gov/sites/prod/files/2015/09/f26/bto_common_definition_zero_energy_buildings_093015.pdf

¹³⁷ UN Secretariat, The Department of Economic and Social Affairs of the United Nations. (2013). UN world economic and social survey 2013. *Sustainable Development Challenges*. Retrieved from: https://www.researchgate.net/publication/255708480_UN_World_Economic_and_Social_Survey_2013_Sustainable_Development_Challenges; Vashisth, A., Kumar, R., & Sharma, S. (2018). Major principles of sustainable

1. *The market management body hires architects and urban designers to work on facilitating non-motorized forms of transport inside the market.*
 2. *The market management body coordinates with the public transport body to facilitate public access to markets.*
5. Telecommunication systems: this system relies on providing telecommunication lines and mobile coverage linking the market with the surroundings¹³⁸. The actants and their relationships, for the telecommunication systems, are expressed in the following:
1. *The market management body coordinates with the telecommunication company for supplying the market with telecommunication lines and mobile coverage.*

Besides developing the infrastructure inside the market, renovating the urban fabric is important as well for urban growth and regeneration. Renovating the urban fabric is a vital component for a better functioning of the market and regenerating its surrounding area where it helps to revive the urban spaces and ensure the presence of a non-deteriorated fabric that allows for a healthy comfortable environment that eliminates any spatial difficulties. Renovating the urban fabric includes renovating the hardscape elements such as walkways, driveways, benches, seating, walls, fences, edgings, water features, lighting, pergolas, and patios if any, and refurbishing the softscape elements besides increasing the percentage of green areas.¹³⁹ Renovating the urban fabric demands these basic actants and their relationships:

- *The market management body hires architects and contractors who work on renovating the urban fabric inside the market.*

Aside from renovating the urban fabric, urban growth and regeneration encompass creating new/reviving existing poles of tourism attraction, focal points, and landmarks. Creating/reviving poles of tourism attraction, focal points, and landmarks and linking them to each other and to the market helps the market to be more attractive and helps prosper the surrounding area of the market. That is because tourism attractions make the market and the whole surrounding area more popular and profitable since they grab tourists and add an

transport system: A literature review. *International Journal for Research in Applied Science & Engineering Technology*, 6. Retrieved on Jan 14, 2021, from: <https://www.researchgate.net/publication/323336900>

¹³⁸ Moss, M., Kaufman, S., & Townsend, A. (2006). The relationship of sustainability to telecommunications. *Technology in Society*, 28(1–2). Retrieved on Jan 14, 2021, from: <http://www.sciencedirect.com/science/article/pii/S0160791X05000643>

¹³⁹ Habib, F., Peimani, N., & Reza Daroudi, M. (2013). Urban deteriorated fabric regeneration according to public open space enhancement, case study: Tabriz. *World Applied Sciences Journal*. Retrieved on Jan 13 from: DOI: 10.5829/idosi.wasj.2013.21.8.119

international exposure to the area of the market.¹⁴⁰ Whereas focal points and landmarks inside or surrounding the market serve to define the whole area and act as navigational aids, in this regard, they help achieve better wayfinding for the market and its surrounding area¹⁴¹. Creating/reviving poles of tourism attraction, focal points, and landmarks can be achieved by designing/renovating iconic elements in the market and surrounding it, besides conducting advertisement campaigns for attracting tourists to the newly designed/renovated area¹⁴². The actants and their relationships, who can help achieve new poles of tourism attraction, focal points, and landmarks, are shown below:

1. *The local government* coordinates with the NOUH/Specified governmental body to design/revive and link the surrounding landmarks and iconic buildings to the market.
2. *The local government* coordinates with *The State Information Service* to conduct advertisements for both (the proposed to be revived/designed) *landmarks and iconic buildings*, and the *market*.
3. *Landmarks and iconic buildings* increase the attraction for the *market* and contribute to better wayfinding.

The last component that assists in urban growth and regeneration for the market and its zone of influence is creating active public spaces in or surrounding the market. Quality public spaces can help the market function in a better way and revitalize its surrounding area. That stems from the fact that they create areas with a greater urban vitality that attracts people, increases safety and security, and elevates the quality of life by presenting a medium where people can move actively and exchange ideas.¹⁴³

Active public spaces can be created in or around the market by having pavilions, gardens, parks, playgrounds, cafes...etc. The actants and their relationships, for creating active public spaces, include the following:

1. *The local government* in coordination with the *market management body* hires *architects and contractors* to design *public spaces* in and around the market.
2. *The market management body* in coordination with the *local government* rents or sells the *public spaces* for *tenants and leaseholders* for them to operate the *public spaces*, this can

¹⁴⁰ Galdini, R. (2007). Tourism and the city: Opportunity for regeneration. *TOURISMOS: An International Multidisciplinary Journal of Tourism*, 2 (2). Retrieved on Jan 13 from: <http://mpira.ub.uni-muenchen.de/6370/>

¹⁴¹ Hirtle S. (2008). Wayfinding, landmarks. In: Shekhar S., Xiong H. (eds) *Encyclopedia of GIS*. Springer. Retrieved from: https://doi.org/10.1007/978-0-387-35973-1_1471

¹⁴² Pannozo, (2013), Policy paper on the role of urban markets; Galdini, (2007), Tourism and the city; Hirtle, (2008), Wayfinding, landmarks.

¹⁴³ Pacheco, P. (2017). Public spaces: 10 Principles for connecting people and the streets. *The City Fix, World Resources Institute*. Retrieved January 8, 2021, from: <https://thecityfix.com/blog/public-spaces-10-principles-for-connecting-people-and-the-streets-priscila-pacheco/>

be substituted by having the *local government* or the *market management body* in charge of operating the *public space* alone by itself (according to the regulatory norms of each city).

3.3.3. Engine for community life

Public markets' functions exceed being a medium for exchange and urban growth to an engine for community life. Public markets are not just a medium of materialistic exchange, but rather a social hub that hosts diverse people of different genders, ethnicities, races, socioeconomic statuses, and ages together around the experiences of shopping. Thus, they embrace lots of interactions, proximity, and diversity and that rank them as “the most socially diverse public places in a community”.¹⁴⁴

Being an engine for community life, as a core function of the market, demands the presence of several factors. These factors include: having a free non-controlled experience, bringing diverse people together, and having a high level of socialization. The first factor, being free and non-controlled, makes the public market retain its “traditional character of being an urban fact that has a completely different experience from the generic and controlled environment of the hyper places and department stores”¹⁴⁵. Moreover, holding freedom of institutional control fosters the economic realm of the market, as it gives room for small and medium businesses to sell cheaper goods to the middle and lower classes of public consumers¹⁴⁶. Thus, this non-controlled experience contributes to bringing different segments of the society inside the market and offering them a healthy space for interaction. The second factor, bringing diverse people together in the market helps to make the market a fueled engine for communal life. Bringing people of different backgrounds, genders, races, ages, and economic classes generates a social medium that is not found in any other space¹⁴⁷. The actants and their relationships, for achieving a diverse free non-controlled experience, are shown as follows:

- *The market management body* maintains a non-controlled experience and fosters diversity inside the *market*.

The remaining factor, that assists in making the market a communal engine, is having a high level of socialization. This factor works on achieving this social function by

¹⁴⁴ Caramaschi, (2014), Public markets; Pannozo, (2013), Policy paper on the role of urban markets, p.9.

¹⁴⁵ Caramaschi, (2014), Public markets, p.3-4.

¹⁴⁶ Ibid.

¹⁴⁷ Pannozo, (2013), Policy Paper on the role of Urban Markets.

strengthening proximity, social cohesion, and sense of community and developing effective social coalitions.¹⁴⁸ The actants and their relationships, that should exist for achieving a high level of socialization, include:

1. *The market management body* builds a sense of belonging and community between the *merchants, auxiliary workers, and the customers.*
2. *The market management body* fosters the growth of *social coalitions*, while the *merchants and auxiliary workers* work to build them.

3.3.4. Fostering economic development

Public markets extend in their functionality to act as an umbrella for economic development for the associated communities and neighborhoods. Since public markets are connector hubs and economic engines for various communities, where they host local economics and local trade between the associated communities, therefore, it is a core function of public markets to foster economic development by creating local employment opportunities and providing room for small and medium businesses that grow in the surrounding neighborhoods.¹⁴⁹ This can be achieved by having these actants and their relationships:

1. *The market management body* provides room and opportunities for *local workers and small and medium businesses.*

3.3.5. Quality urban life

The last function that public markets should be performing is creating a quality urban life for the market and its surrounding urban spaces. Creating a quality urban life is crucial to the functioning of the market and its associated neighborhoods as it contributes to creating a creative comfortable environment where people are motivated to live, work, and enjoy. Creating a quality urban life can be achieved by increasing safety and inspiring people in their daily life. Increasing safety in the market and the associated neighborhoods increases the sense of comfort in the daily lives of the users and community members. Safety can be achieved by having effective security systems (whether governmental or communal) to prevent theft and harassment, and the presence of a safe setting for all types of users (including women, children, elderly and disabled) that is always well-maintained (considering the disabled measures), with no dark ends and with non-hazardous materials. Safety can also be achieved by avoiding

¹⁴⁸ Caramaschi, (2014), Public markets.

¹⁴⁹ Caramaschi, (2014), Public markets; Ismail, S. (1996). The politics of space in urban Cairo: Informal communities and the state. *The Arab Studies Journal*, 4, (2), 119-132. Retrieved from: <https://www.jstor.org/stable/27933703>

potential hazards and risks such as fires, accidents, earthquakes, collapses, and landslides. Avoiding potential hazards and risks can be done by having effective firefighting systems, applying accidents' prevention measures, ensuring the presence of strong tolerant structures that endures earthquakes and deter collapses, and building retaining walls and diaphragms at slopes.¹⁵⁰ The actants and their relationships, that contribute to achieving safety in the market and its surrounding urban spaces, are listed as follows:

1. *The market management body employs a security company/communal security group for having a good security system inside the market to prevent theft and harassment.*
2. *The market management body supervises the market regulators who should regulate the safety of the market and keep it well maintained for the different types of users: women, children, elderly and disabled, as well as avoid the presence of dead ends, and hazardous materials.*
3. *The market management body hires fire safety consultants for providing firefighting systems inside the market.*
4. *The market management body coordinates with the mobility and transport body for providing accidents avoidance measures for the market.*
5. *The market management body hires structural engineers and consultants for checking the soundness of structures and the overall setting of the market.*

The second edge of creating a quality urban life is inspiring the market's users in their daily life by satisfying their needs and creating an enjoyable creative environment¹⁵¹. The actants and their relationships, for creating active public spaces, include the following:

1. *The market management body holds recurrent participatory meetings for problem-solving and needs-satisfaction for the merchants, auxiliary workers, and consumers as well as providing an open medium for suggestions for upgrading the market's environment to make it more enjoyable.*

Having illustrated all the functions, components, factors, actants, and relations, that the market should deliver, a collective table for the overall schema is shown below in table (4).

¹⁵⁰ Caramaschi, (2014), Public markets; Elvik R., Fridulv S., & Per Andreas L. (2019). An analysis of factors influencing accidents on road bridges in Norway. *Accident Analysis and Prevention*, 129, 1-6. Retrieved 9 December 2020 from: <https://doi.org/10.1016/j.aap.2019.05.002>; Tracey-White, (2003), Planning and designing rural markets.

¹⁵¹ Caramaschi, (2014), Public markets.

Table 4- A General Schema for the Markets' Analysis

Main Function	Components and factors		Points ¹⁵²	Involved actants ¹⁵³ (human/non-human)	Actants and their relationships
1. Exchange	1.1. Offering a wide range of commodities and services for different classes at competitive prices.	1.1.A. The presence of sustainable and resilient selling objects, such as booths, shops, stalls, and selds.	4	Merchants, market regulators, display space, storage, and exchange space.	
		1.1.A.1. The presence (1 point) of display space that is: <ul style="list-style-type: none"> • Attractive (1point) • Organized (1point) • And sustainable (1 point). 	4		
		1.1.A.2. The presence (1 point) of storage space that is: <ul style="list-style-type: none"> • Secure (1 point) • Climate-controlled (1 point) • And pest-free (1 point). 	1		
	1.1.A.3. The presence of an exchange space (1 point).	3	Factories, workshops, merchants and auxiliary workers, warehouse, distributors, market regulators, service lanes, and shops.		
1.1.B. Goods distribution and supply systems.	2				

¹⁵² The schema provides a **point system** that acts as an **indicator** only (not a statistical component) for determining generally how much a market is functioning well. The point system depends on having 1 point for the presence of the factor/component or 0 points for its absence, and 1 point for each quality attributed to the factor/ component or 0 points for its absence. Thus, it is a yes/no component based on the availability or the absence of the factors/components/ attributed qualities. The scholar/interested audience should be giving points to each present component/factor/ attributed quality, then he/she should be calculating the total number of points given to the market under study divided by the overall number of points multiplied by 100 to get a percentage. This percentage provides an indicator of how much the market under study is functioning well.

¹⁵³ Note 1: The actants' names may vary from one context/country to the other, so it is the responsibility of the interested audience who will use the schema to provide the name of the entities/individuals who should be carrying out the role of each actant.

Note 2: A single-angled straight line \rightarrow indicates a unidirectional relationship, whereas a double-angled straight \leftrightarrow line indicates a bidirectional relationship.

Note 3: An arrowed straight line \rightarrow indicates a direct relationship, whereas a dashed line \dashrightarrow indicates an indirect relationship that demands a mediating actant.

		1.1.C. The presence of merchants, auxiliary workers, and customers.	1.1.C.1. Merchants and auxiliary workers show frequent (1 point) presence (1 point) in the market's working hours.	2	Merchants and auxiliary workers, customers, profit, and market regulators.	<pre> graph LR MW[Merchants & workers] -- Selling goods --> C[Customers] C -- Exchange acts generates --> P[Profit] MW -- Constant Income --> P MR[Market regulators] -- Monitoring Presence --> MW </pre>
			1.1.C.2. Merchants and auxiliary workers gain income from the earned profit that is achieved by the continuous exchange acts between them and the customers (1 point).	1		
			1.1.C.3. A diverse segment of customers (including men, women, children, elderly and disabled) visit the market on a regular basis and buy goods (1 point).	1		
	1.2. Positioning and Reachability	1.2.A. Positioned near to many communities.	1.2.A.1. Close to the customers' residence (1 point).	1	Mobility planners, traffic officers, the Government, efficient road links, market, district's main axis, public transport facilities, commercial and social facilities, customers' communities, merchants' communities, and auxiliary workers' communities	<pre> graph TD MPTG[Mobility planners, traffic officers, & the Government] -- Establishing --> RL[Road links] RL -- Linking to the market & Making distance closer --> CSF[Commercial & social facilities] RL -- Linking to the market & Making distance closer --> PTF[Public transport facilities] RL -- Linking to the market & Making distance closer --> DMA[Districts' main axis] PTF -- Linking & Transporting --> C[Customers] PTF -- Linking & Transporting --> AW[Auxiliary workers'] PTF -- Linking & Transporting --> M[Merchants] MPTG -- Studying --> M MPTG -.-> making the market more reachable M </pre>
			1.2.A.2. Close to the merchants' residence (1 point) and the auxiliary workers' residence (1 point).	2		
		1.2.B. Linked to the districts' main axis to be easily reached (1 point).	1			
		1.2.C. Close to public transport facilities (1 point).	1			
		1.2.D. Close to commercial facilities (1 point) and social facilities (1 point).	2			

	1.3. Accessibility	1.3.A. Presence of access points for users (1 point) that are clearly defined (1 point).			2	Access points for customers, merchants, and workers, access points for goods, market regulators, internal passages, shops/stalls, unloading decks, and service lanes.	
		1.3.B. Presence of access points for delivering goods to the market (1 point) in an easy manner (1 point).			2		
	1.4. Smooth internal circulation and Mobility	1.4.A. Presence of a network of passages/local streets (1 point) connecting to all stalls and shops (1 point).			2		
	1.5. Average built-up Density	1.5.A. A built-up form that compromises between compactness (1 point) and uncrowdedness (1 point).			2		
1.6. Management	1.6.A. Permanent stable operations	1.6.A.1. Operations of market rules and regulations	1.6.A.1. Operations of market rules and regulations	1.6.A.1.1. Stable (1 point) working hours for the market (1 point).	2	Market management body, market regulators and operators, merchants and auxiliary workers, customers, goods, shops and stalls, and the whole market.	
				1.6.A.1.2 Application of rental (1 point) and stall-allocation policies (1 point).	2		
				1.6.A.1.3 Fees collection (1 point) and taxes collection (1 point).	2		
				1.6.A.1.4. Security (1 point) and traffic control (1 point).	2		
				1.6.A.1.5. Enforcement of environmental (1 point), public health (1 point) and food safety requirements (1 point).	3		
				1.6.A.1.6. Hygiene control (1 point) and product inspection (1 point).	2		
				1.6.A.1.7. Keeping public order (1 point).	1		

			<u>1.6.A.2.</u> Administration (1 point) and record keeping (1 point).		2			
		<u>1.6.B.</u> Continuous maintenance	<u>1.6.B.1.</u> Recurrent (1 point) Cleaning (1 point).		2	Market management body, Cleaning and maintenance facilities, and the market.		
			<u>1.6.B.2.</u> Improvement of facilities (1 point) and used objects. (1 point).		2			
	<u>1.7.</u> Attractiveness	<u>1.7.A.</u> The presence of engaging elements (1 point) and sensory temptations (1 point).				2	Market management body, market, architects and contractors, local municipality, and the surrounding buildings.	
		<u>1.7.B.</u> The presence of interesting facades (1 point).				1		
		<u>1.7.C.</u> The presence of entertainment features (1 point).				1		
2. Urban growth and regeneration 154	<u>2.1.</u> Preserving culture and historic heritage	<u>2.1.A.</u> Renovating historic monuments (1 point) and ancient buildings (1 point).			2	Ministry of Antiquities, NGOs, International organizations, architects, historical monuments, and cultural buildings.		

¹⁵⁴ The function of public markets extends to urban growth and regenerations of its zone of influence. The zone of influence of the market is the area affected by the market's performance, functioning systems and components, it can be the surrounding neighborhoods and communities in mega cities and large portions of the city in mini cities, and whole towns in town villages. It can include planned/unplanned, formal/informal areas.

	2.2. Integrating communities	2.2.A. Linking the rural to the urban.	2.2.A.1. Delivering rural handmade goods to the public market (1 point) and offering stalls for them (1 point).		2	Market management body, and rural merchants.	<pre> graph LR A[Market management body] -- "Communicating with rural merchants & offering stalls for them" --> B[Rural merchants] </pre>
			2.3.A. Water supply and treatment systems.	2.3.A.1. Providing clean (1 point) water systems (1 point).		2	Water company, market, and market management body.
	2.3.A.2. Minimizing freshwater consumption.	2.3.A.2.1. Use of sensors/other reductive techniques (1 point).		1			
	2.3.A.3. Recycling used water.	2.3.A.3.1. Treated grey water (1 point).		1			
		2.3.A.3.2. Treated black water systems (1 point).		1			
		2.3.A.3.3. Harvested rainwater (1 point).		1			
	2.3.B. Waste generation and treatment systems.	2.3.B.1. Waste collection (1 point).		1	Waste management company/informal waste pickers, market, and market management body.	<pre> graph LR A[Waste Management Company/informal waste pickers] -- "Waste collection" --> B[Market] A -- "Waste recycling" --> B C[Market management body] -- "Coordination" --> A C -- "Reducing waste generation" --> B </pre>	
		2.3.B.2. Reducing waste (1 point).		1			
		2.3.B.3. Recycling waste (1 point).		1			
	2.3. Developing infrastructure	2.3.C. Energy generation and supply systems.	2.3.C.1. Supplying green renewable (1 point) energy (1 point).		2	Energy company, market management body, market, and architects and consultants.	<pre> graph LR A[Energy Company] -- "Energy supply/ Installing energy systems" --> B[Market] C[Market management body] -- "Coordination" --> A C -- "Hiring" --> D[Architects & Consultants] D -- "Passive energy techniques" --> B D -- "Reducing fossil fuel energy & Using energy efficient appliances" --> B </pre>
			2.3.C.2. Minimizing the use of fossil fuel energies (1 point).		1		
		2.3.C.3. Reducing energy uses.	2.3.C.3.1. Reducing heating and cooling loads using passive energy saving techniques (1 point).	1			
			2.3.C.3.2. Using energy efficient appliances (1 point) and lighting fixtures (1 point).	2			

		2.3.D. Transport and mobility systems.	2.3.D.1. Facilitate non-motorized forms of transport inside the market, like cycling or walking (1 point).		1	Market management body, public transport body, architects and urban designers, and the market.	<pre> graph TD MM[Market management body] -- Hiring --> AD[Architects & urban designers] AD -- Facilitate non-motorized forms of transport & cycling lanes --> M[Market] MM -- Coordinating --> PTB[Public transport body] PTB -- Facilitate public access to markets --> M </pre>
			2.3.D.2. Integrating public transport to facilitate access to markets (1 point) while reducing private cars (1 point).		2		
		2.3.E. Telecommunication systems.	2.3. E.1. The presence of telecommunication lines and mobile coverage linking the market to the surroundings (1 point).		1	Market management body, telecommunication company, and the market.	<pre> graph LR MM[Market management body] -- Coordination --> TC[Telecommunication Company] TC -- Communication systems supply --> M[Market] </pre>
	2.4. Urban fabric	2.4.A. Renovating hardscape using sustainable materials.	2.4.A.1. Walkways (1 point).		1	Market management body, architects and contractors, and the market.	<pre> graph TD MM[Market management body] -- Hiring --> AC[Architects & Contractors] AC -- Renovating urban fabric --> M[Market] </pre>
			2.4.A.2. Driveways (1 point).		1		
			2.4.A.3. Seating (such as benches... etc.) (1 point).		1		
			2.4.A.4. walls and fences (2 points).		2		
			2.4.A.5. Edgings (1 point).		1		
			2.4.A.6. Pergolas (1 point).		1		
			2.4.A.7. Water features (1 point).		1		
2.4.A.8. Lighting (1 point).			1				
	2.4.B. Renovating softscape (1 point) and increasing green areas (1 point).		2				

	2.5. Tourism attraction	2.5.A. Creating new poles of tourism attraction.	2.5.A.1. Reviving/designing new/existing iconic elements in/close to the market (1 point).		1	Local Government, NOUH, landmarks and iconic buildings, The State Information Service, and the market.	<pre> graph TD LG[Local Government] -- Coordinate with --> NOUH[NOUH] LG -- Coordinate with --> TSI[The State Information Service] NOUH -- Designing/Reviving & linking --> L[Landmarks & iconic buildings] TSI -- Publicizing & advertising --> M[Market] L -- better wayfinding --> M M -- Increasing attraction & --> L </pre>			
		2.5.A.2. Publicizing and advertising for tourism attraction (1 point).	1							
	2.6. Creating/reviving and connecting focal points (1 point) and landmarks (1 point) for better attraction and wayfinding in the market.				2					
	2.7. Creating active public spaces in/ surrounding the market.	2.7.A. Pavilions (1 point).						1	Local Government, market management body, architects and contractors, tenants/ leaseholders, and public spaces.	<pre> graph TD LG[Local Government] -- Hiring --> AC[Architects & Contractors] AC -- Designing --> PS[Public spaces] MM[Market management body] -- Renting/selling --> TL[Tenants/lease holders] TL -- Operating --> PS LG <--> Coordination MM </pre>
		2.7.B. Gardens/parks (1 point).						1		
		2.7.C. Restaurants/cafes (1 point).						1		
		2.7.D. Playgrounds/other similar spaces (1 point).						1		
	3. Engine for Community life	3.1. Free non-controlled experience.	3.1.A. Freedom of institutional control (1 point).					1	Market management body, and the market.	<pre> graph LR MM[Market management body] -- Maintaining a non-controlled experience & fostering diversity --> M[Market] </pre>
		3.2. Bring diverse people together (1 point).						1		
		3.3. High level of socialization.	3.3.A. Proximity (1 point), social cohesion (1 point), and sense of ownership and belonging (1 point).						3	Market management body, merchants and auxiliary workers, and social coalitions.
3.3.B. The presence of social coalitions (1 point) that are effective (1 point).			2							

4. Fostering economic development	4.1. Creating local employment opportunities (1 point).				1	Market management body, small and medium businesses, and local workers.	<pre> graph LR A[Market management body] -- "Providing room and opportunities" --> B[Small and medium businesses] A --> C[Local workers] </pre>	
	4.2. Room for small (1 point) and medium businesses (1 point).				2			
5. Quality urban life	5.1. Increasing safety	5.1.A. The presence of effective (1 point) security systems (governmental/communal) to prevent theft and harassment (1 point).			2	Market management body, market regulators, security company/communal security group, fire safety consultants, mobility and transport body, structural engineers and consultants, and the market.	<pre> graph TD A[Market management body] -- "Employing, supervising & coordinating with" --> B[Security Company/communal security group] A --> C[Fire safety consultants] A --> D[Market regulators] A --> E[Mobility & transport body] A --> F[Structural engineers & consultants] B -- "Providing security systems" --> G[Market] C -- "Providing firefighting systems" --> G D -- "Regulating the safety of the market & well-maintaining its setting for all types of users. Avoiding the presence of dead ends, and hazardous materials" --> G E -- "Providing accidents' avoidance measures" --> G F -- "Checking the strength of structures and treating slopes" --> G </pre>	
		5.1.B. The presence of a safe setting for all types of users (including women, children, elderly and disabled).	5.1.B.1. The presence of a well-maintained setting that considers the disabled measures (1 point) and is free from dead ends (1 point) and hazardous materials (1 point).		3			
		5.1.C. Avoiding potential hazards and risks (such as fires, accidents, earthquakes, collapse, landslides).	5.1.C.1. The presence of a firefighting system (1 point).		1			
			5.1.C.2. Applying accidents' prevention measures (1 point).		1			
			5.1.C.3. The presence of strong tolerant structures for enduring earthquakes and avoiding collapses (1 point).		1			
			5.1.C.4. Building retaining walls at slopes (1 point).		1			
		5.2. Inspiring people in their daily life	5.2.A. Satisfying the users' needs (merchants, workers, and customers) (1 point).		1			Market management body, merchants, auxiliary workers, and customers.
	5.2.B. Creating an enjoyable (1 point) creative (1 point) environment.			2				
	Total no. of points					121		

3.4. A Complementary Analytical Lens for the Schema

Having completed the analytical schema in former section 3.3. based on the ANT theory, another analytical lens is added to cover the ANT and respectively the schema gaps. The previous schema was based on determining the functions that the public market should be performing (as an object), then it broke down the main functions into subdivided components and factors. After that, it determined the involved actants denoting sole or collective agents who act in relation to other actants to fulfill the desired function¹⁵⁵. The main functions, subdivided components, factors, actants, and relations were expressed in the above table (4) to be used as an analytical lens for public markets in relation to their zone of influence. Having a closer look at the schema— which is based on the ANT theory— it is found that the actants can be both human and non-human entities showing the importance of the non-human elements and their relative impact in delivering the function. However, equating between the human and non-human actants has resulted in ignoring the different capacities of human and non-human agents, unrevealing the gaps of the ANT¹⁵⁶.

Because the ANT ignores the dual nature of the world and deals with the human and non-human elements as actants in one assemblage without stating their different capacities and properties, another analytical lens based on the Marxist theory and the SMTT systems approach is used to complement the schema¹⁵⁷. After determining the functions, components, factors, actants, and relations, another layer of analysis is added to understand how the human aspect has the greater influence over the whole object, the market, and how the human aspect can be classified in its own systems, the non-SMTT systems, still affecting the other non-human systems, the SMTT systems. That demands putting the Marxist mode of production model in integration with the SMTT systems approach as a supplementary way of analysis with the analytical schema in the mode of production.

As shown below in figure (33), the mode of production model deals with the market as a system of systems that varies between the SMTT and the non-SMTT systems. It is comprised of three main pillars:

1. The elements of production that vary between production, distribution, exchange, and consumption systems. These systems are specific, measurable, tangible, and timely so they follow the SMTT type of systems. The production system is concerned with all the

¹⁵⁵ Farías et al., (2012), Urban assemblages

¹⁵⁶ Farías et al., (2012), Urban assemblages; Shoaib, (2015), Highway urban assemblage.

¹⁵⁷ Elder-Vass, (2015), Disassembling Actor-network theory.

components that work together in a system to produce a certain type of product/service. The production system can be part of the market (production on-site), attached to it, or separated from it. This complementary analytical lens demands determining the relation between the market and the production system if it has a direct influence on it. The distribution system deals with distributing and supplying the market with the goods from the production sites or the warehouses, whereas the exchange system involves all the acting systems that facilitates the exchange process on-site such as transport and mobility systems, energy- water- waste systems, communication systems, the urban fabric, and the built systems. The consumption system depends on the consumption process that the end-user carries out with the product/service. Production and consumption may or may not be directly related to the market depending on the nature of the market and its surrounding context so they can be excluded from this model if they did not have a considerable impact on the market's functionality.¹⁵⁸

2. The relations of production that stem from the technical relations of production, the social relations of production, and the commercial relations of production. The relations of production play a huge role in affecting the SMTT systems in the elements of production. Mutually, the elements of production affect these relations of production.¹⁵⁹
3. The forces of production that contain the drivers that call for a certain type of production. These forces contain the social systems, political systems, culture, and identity, thus, these

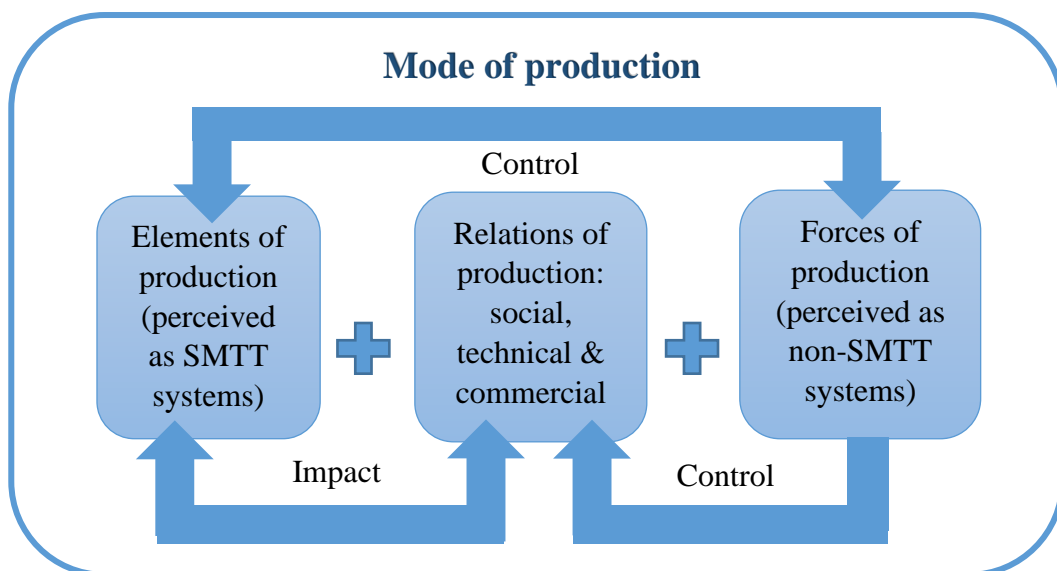


Figure 33- The Mode of Production (Author's Illustration)

¹⁵⁸ Blackledge, (2006), Reflections on the Marxist theory of history, p.32.

¹⁵⁹ Ibid.

forces are the non-SMTT type of systems that affect the market, shape it, and control the elements of production (SMTT systems) and the relations of production.¹⁶⁰

Having illustrated the mode of production model that shows the two folds of duality and how these dualities affect and shape each other, a demonstration of how to use the analytical schema with the mode of production is shown in the coming section for the aim of analyzing the market and proposing guidelines for developing it in integration with its zone of influence revitalization.

3.5. Creating the Development Framework

This section explains how to use the development framework in sequence starting with the analysis phase reaching to developing the guidelines for developing any market in integration with its zone of influence revitalization¹⁶¹. The development framework first requires an analytical stage that is based on using the analytical schema and the mode of production model as a complementary analytical lens. The schema has been based on the ANT theory as shown below in figure (34). It serves as a checklist that any interested scholar can use for evaluating the market's current performance, where it presents the functions, factors, actants, and relations, thus it can be used for developing any market by determining the absent actants, or relations that result in poor or incomplete functioning. Besides listing the functions, components, factors, qualities, actants, and relations, the schema provides a *point system* that acts as *an indicator* only (not a statistical component) for determining generally how much a market is functioning well. The point system depends on having 1 point for the presence of the factor/component or 0 points for its absence, and 1 point for each quality attributed to the factor/component or 0 points for its absence. Thus, it is a yes/no component based on the availability or the absence of the factors/components/ qualities attributed. The scholar/interested audience should be giving points to each present component/factor/ attributed quality, then he/she should be calculating the total number of points given to the market under study divided by the overall number of points multiplied by 100 to get a percentage. This percentage provides an indicator of how much the market under study is functioning well. By getting an indicator of the market's

¹⁶⁰ Blackledge, (2006), Reflections on the Marxist theory of history, p.32.

¹⁶¹ The zone of influence of the market is the area affected by the market's performance, functioning systems, and components, it can be the surrounding neighborhoods and communities in mega cities and large portions of the city in mini cities, and whole towns in town villages. It can include planned/unplanned, formal/informal areas.

Determining the zone of influence can be achieved in a detailed manner through the process of analysis using the schema and the mode of production model, where the analysis phase is designed in a way that shows which areas affects and are being affected by the market, thus determining the zone of influence of the market. Moreover, a brief guideline is presented in appendix E summarizing how the zone of influence of a market can be determined through the analysis phase of the development framework.

performance and tapping on the missing items, the researcher can develop guidelines that contribute to the development of the market and its zone of influence. These guidelines can be proposed by integrating the missing actants/relationships or by incorporating the missing qualities to the existing actants/components/factors as stated in the schema. Similarly, this schema can be used for building new markets since it presents a guide for all the needed components, factors, actants, and relations for a successful functioning.

Since this schema tries to accommodate for specificity respecting the particular nature and context of each market, therefore it does not specify the kind of actants (whether Fluid, Euclidean, or Network) nor the relations between the actants (whether direct, indirect, unidirectional, bidirectional, multidirectional, temporary, or permanent), rather it shows only the importance of their presence. That is because the kind of actants and relations is context-specific, thus it is the role of the scholars (who are going to use the schema) to determine the kind of actants and relations that best suit the context when studying a certain market in depth. It is also his/her role to balance between the Fluid, Network, and Euclidean actants in order to create a topology that accommodates for stability, continuity, and spatial resilience.

As part of covering the ANT gaps, the SMTT systems approach and the Marxist theory of production are used to create the mode of production model that is used as a complementary analytical lens to the analytical schema. The ANT gaps included rejecting the dualism of systems and equating between material actants and human actants, not showing the different capacities of each, and how the human being has the greater influence over the matter. In other words, the ANT—and by succession, the analytical schema—does not show how the social, political, and cultural non-SMTT systems have great dominance over the physical materialistic SMTT systems. In an attempt to cover these gaps, the SMTT systems approach and the Marxist theory of production have been used to create the mode of production model. The SMTT systems approach taps on the dual nature of the world distinguishing between the materialistic systems and the social ones. It is based on analyzing any type of object by the two dualistic folds of classification, the SMTT and the non-SMTT systems, and noticing how these different types of systems impact each other. This approach stresses on studying how the different systems interlace affecting each other in any given object, but it does not dictate a certain methodology for studying these systems, a gap that the Marxist theory of production is used to cover. The Marxist theory of production complements the ANT theory and the SMTT systems approach as it presents a method for studying the different systems, examining their evolution, and investigating how the non-SMTT systems are translated into the SMTT systems in a way that affects and shapes their form. The Marxist theory of production along with the SMTT

systems approach are used to construct the mode of production model, the second analytical lens that is used to complement the analytical schema as shown below in figure (34).

The mode of production, as a complementary analytical lens to the schema, serves as a guide to understand how the different systems (SMTT and non-SMTT) are working, and how the social systems have the greater influence and impact over others. The scholar/interested audience should be using the mode of production model to determine the actual elements of production found in the site of the market under study, or closely related to it. A detailed explanation of the SMTT systems found in the elements of production should be set and an overall evaluation for their performance should be conducted. Relations of production for the market under study should then be determined with an examination of how they impact the elements of production and vice versa. Lastly, forces of production should be studied showing the social, political, and cultural drivers that orient the market, its elements, and relations of production towards a certain direction that shapes its current mode. It should be noted that the positive and negative impact of the forces of production should be examined and how that impact affects the elements and relation of production, and vice versa.

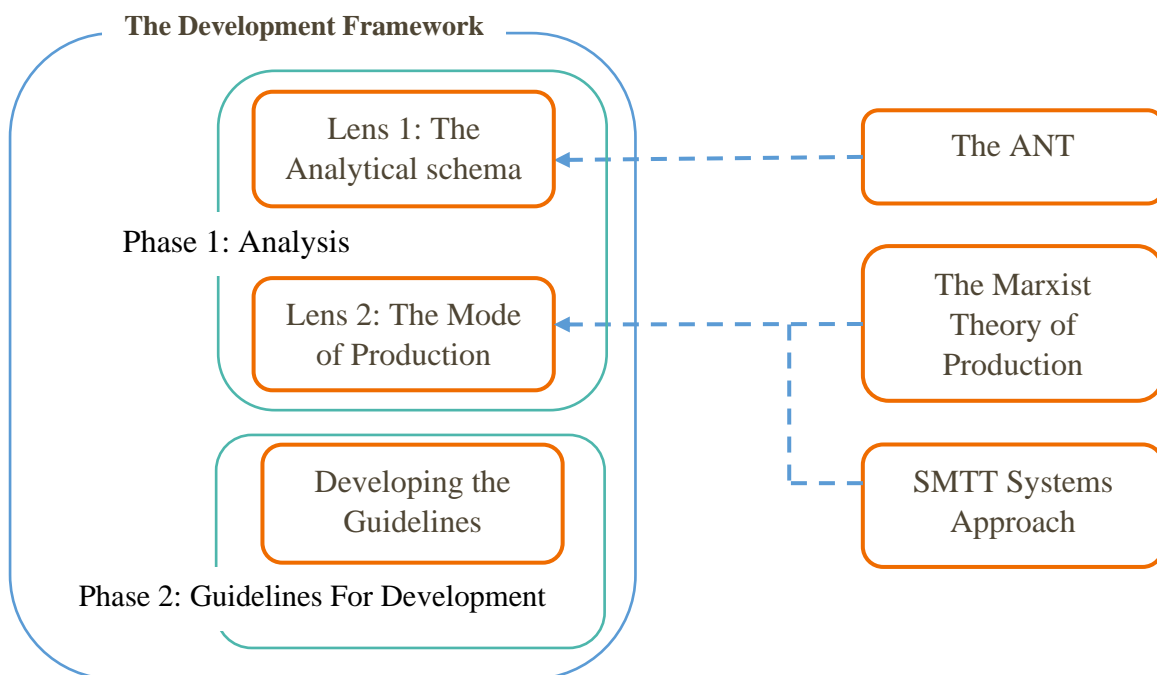


Figure 34- The Development Framework, (Author's Illustration)

After using the main analytical schema and the mode of production model for analyzing the market under study, proposing guidelines for revitalizing the market and its zone of influence becomes an exigency. Proposing the guidelines is based mainly on:

1. Figuring out:

- The missing functions, qualitative components, factors, actants, and relations (using the schema as a checklist).
- The malfunctioning systems both in the elements and forces of production and the negative sides of the relations of production (using the mode of production model).

2. Treating:

- The missing elements marked in the analysis phase by incorporating their existence back again in the market for a better functioning.
- The negative sides or the malfunctioning systems that appear in the analysis phase either directly by treating them or indirectly by remediating what affects them in other systems.

After showing the main basis of developing guidelines, a summary of the framework used for analyzing any market and developing it in integration with its zone of influence revitalization is shown in order below:

1. Using the schema as a checklist for the presence or absence of functions, qualitative components, factors, actants, and relations.
2. Evaluating the market's performance using the grading system.
3. Using the mode of production model to study the elements, relations, and forces of production of the market and marking the malfunctioning systems.
4. Proposing guidelines for development through these 3 steps:
 - a) Integrating the missing functions, qualitative components, factors, actants, and relationships.
 - b) Determining the kind of actants and relations that best suit the context of the market and the surrounding zone of influence, maintaining a mix of the different kinds of actants and objects (Fluid, Network, Euclidean) as needed to achieve stability and sustainability.
 - c) Treating the malfunctioning systems that appear in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems.

These steps should be carried out by a multidisciplinary team consisting of experts in Architecture, Urban Design, Construction, Economics, Sociology, Community Psychology, Management, Public Policy, and finally Sustainability. The multidisciplinary team should then develop a detailed agenda and an action plan out of the guidelines for developing the specified market in relation to its surrounding zone of influence.

3.6. Conclusion

In conclusion, this chapter developed a general framework for analyzing public markets and developing them in integration with their zone of influence revitalization. The general framework for development depended on first constructing an analytical schema for analyzing the dynamic components of public markets. The analytical schema was based on a qualitative methodology that included paying 14 field visits to 7 different Cairene markets: Souq Al-Sayyida ‘Aisha, Souq El-Itneen, Souq Al-Tunsi, Souq Al- Jum’a, Al-Azhar street, Souq Al-‘Ataba, and Khan Al-Khalili. Observations and structured interviews were conducted in the field visits with 20 merchants, 5 auxiliary workers, and 11 customers. The data obtained were analyzed using thematic analysis, which was based on classifying the data into definite themes. The qualitative methodology, used to develop the schema, was complemented with secondary research that discussed the centrality of public markets, its relation to the surroundings, its various systems and components, its functioning and performance, its management and urban development, and its role on social connectivity, economic growth, and quality urban life.

Besides being based on the above-mentioned methodology, the schema also relied on the ANT theory, and it comprised the five main functions that any public market should deliver as part of being the heart of the city¹⁶². The five main functions included exchange, urban growth and regeneration, engine for community life, fostering economic development, and creating quality urban life¹⁶³. Each function was broken down generically into a list of qualitative components, factors, actants, and relations, which affected the performance of the function.

Another layer of analysis was added, addressing the ANT gaps, to understand how the human aspect has the greater influence over the whole object, the market, and how the human aspect can be classified in its own systems, the non-SMTT systems, still affecting the other non-human systems, the SMTT systems. That is why the chapter worked to put the Marxist theory in integration with the SMTT systems approach to come up with the mode of production model as a supplementary way of analysis with the analytical schema. The mode of production model comprised three main pillars: the elements of production, the relations of production, and the forces of production. The elements of production, which are the SMTT systems, vary between production, distribution, exchange, and consumption systems. The relations of production stem from the technical relations of production and the social relations of

¹⁶² Costa et al., (2015), Urban markets.

¹⁶³ Ibid.

production, which were partially mediated by the commercial relations of production. Whereas, the forces of production, mainly the non-SMTT systems, contain the drivers that call for a certain type of production. The three main pillars, as illustrated by the chapter in the mode of production model, worked dynamically affecting each other, where the forces of production control the relations and the elements of production. Mutually, the elements of production and the relations of production affect each other and the forces of production, however, with less influence than the forces of production. ¹⁶⁴

Having constructed the collective analytical lens for analyzing public markets, chapter three culminated the development framework with determining the main guidelines for the market's development in integration with their zone of influence revitalization. Developing these main guidelines called for marking the absent functions, qualitative components, factors, actants, and relations, as well as pointing to the malfunctioning systems that appear in the analysis phase. Afterward, the guidelines can be proposed by following these three consecutive steps: first, integrating the missing functions, qualitative components, factors, actants, and relationships, and second, determining the kind of actants and relations that best suit the context of the market and the surrounding communities, to assure stability and sustainability. The third step entailed handling the malfunctioning systems prevalent in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems. Having established the development framework, the researcher will apply it to a public market in the city of Cairo in the coming chapter.

¹⁶⁴ Blackledge, (2006), Reflections on the Marxist theory of history, p.30.

Chapter 4: Applying the Development Framework on a Case Study: Souq Al-Tunsi

4.1. Introduction

After constructing the development framework in the previous chapter, this chapter applies it to a public market in the city of Cairo, Souq Al-Tunsi. Before studying Souq Al-Tunsi, the chapter studies the general context and profile of the Cairene public markets in an attempt to gain an overview of the surrounding problems/potentials and the specific nature that is tied to the Cairene context. The chapter starts by studying the state of the city of Cairo, its need for urban regeneration especially for its informal communities, and the strong relation of Cairene public markets with the informal settlements in Cairo. The chapter then sets a selection criterion for choosing a certain public market in Cairo to be studied. Picking Souq Al-Tunsi following the selection criteria, the chapter demonstrates the qualitative methodology used to acquire data about this market. This qualitative methodology is complemented with secondary research that encompasses information about the market and its zone of influence including its location, context, history, background, and the type of goods that the market offers. The chapter afterward analyzes Souq Al-Tunsi using the analytical schema and the mode of production model, with an evaluation of the market's performance using the grading system. Finally, the chapter proposes context-specific guidelines for the market's development along with revitalizing its zone of influence, which is represented in the surrounding informal neighborhoods and communities.

4.2. The State of the City: The Need for Urban Regeneration

Cairo is known as Egypt's principal city accommodating the country's economic and political life. Not only does the city have a big physical size and a large number of inhabitants, but also it hosts the majority of industries, manufacturing, and services. Growing as the capital of Egypt and the center of jobs and services, the city of Cairo witnessed massive migration acts from the rural countryside. These massive migration acts along with the deceleration of the Egyptian government in providing viable housing to the continuously increasing number of inhabitants have led to unregulated urban expansion that resulted in the formation of informal settlements. Nowadays, informal development is the dominant mode of urbanism in Egypt and

other developing countries. This mode has been found obvious in urban fringes and agricultural lands in major cities, having Cairo on top of the list.¹⁶⁵

Nowadays, Cairo shelters 22.5 million citizens, of which 10.2 million live in informal settlements (such as Imbaba and Izbit Al-Haggana) and precarious housing (such as city of the dead)¹⁶⁶. As illustrated in figure (35), informal settlements carry within their ties informal disenfranchised communities that are ignored by local governments. Since they are informal, they lack governmental representation and state territorial control.



Figure 35- Aerial View on Saft Al-Laban Informal Community (Author's Footage, 2020)

Moreover, they lie outside the city's urban planning, thus, some of them are receiving no/limited services and utilities including freshwater, sewage, and electricity, and others are receiving services of poor quality. They are also deprived of social services like health and education, and of recreational activities such as green parks and entertaining public spaces. Hence, there is a great need for urban development and regeneration for the city's informal communities.¹⁶⁷

4.3. Public Markets as the Major Engines for Informal Communities

Although hugely deprived of ecosystem services and basic utilities, informal communities still live thanks to their local economies that are manifested in public markets¹⁶⁸. As observed, informal communities have their own system of circular local economy fitting the families' low income. This economy delivers local and sometimes homemade/handmade goods in public markets to consumers at affordable prices, also providing decent profit to poor families and disenfranchised members of the informal communities. Public markets also host

¹⁶⁵ Howeidy, A., Shehayb, D., Goll, E., Abdel Halim, K., Sejourne, M., Gado, M., ... Cobbett, W. (2009). Cairo's informal areas between urban challenges and hidden potentials. *GTZ Egypt: Participatory Development Programme in Urban Areas (PDP)*. Retrieved from: <https://www.citiesalliance.org/resources/knowledge/cities-alliance-knowledge/cairos-informal-areas-between-urban-challenges-and>; Ismail, (1996), The politics of space in urban Cairo.

¹⁶⁶ Nassar, D., & Elsayed, H. (2018). From informal settlements to sustainable communities. *Alexandria Engineering Journal*, 57(4), 2367–2376. Retrieved from: doi:10.1016/j.aej.2017.09.004.

¹⁶⁷ Ismail, (1996), The politics of space in urban Cairo.

¹⁶⁸ Ibid.

local trade between communities that are marked to have medium to poor income families. Thus, public markets are connector hubs and economic engines for various informal communities.

As observed, public markets need not necessarily be contained inside the informal communities, to be easily accessible for the various customers coming from different communities whether formal or informal, still, they have to be connected one way or another to the communities they serve. As illustrated below in map (1), (2), (3), and (4), there are various markets across Cairo¹⁶⁹ varying in type, size, and served communities such as Souq Al-Tunsi, Souq Al-‘Ataba, Souq Al-Muski, Al-Azhar St., Souq Al-Itneen, Souq Al-Jum’a, Khan Al-Khalili, Souq Al-Sayyida Aisha, Souq Al-Fustat, Wikalat Al-Ghuriyya. These markets provide different services, and each has its own distinguished experience coming from its unique identity and the type of products it offers.

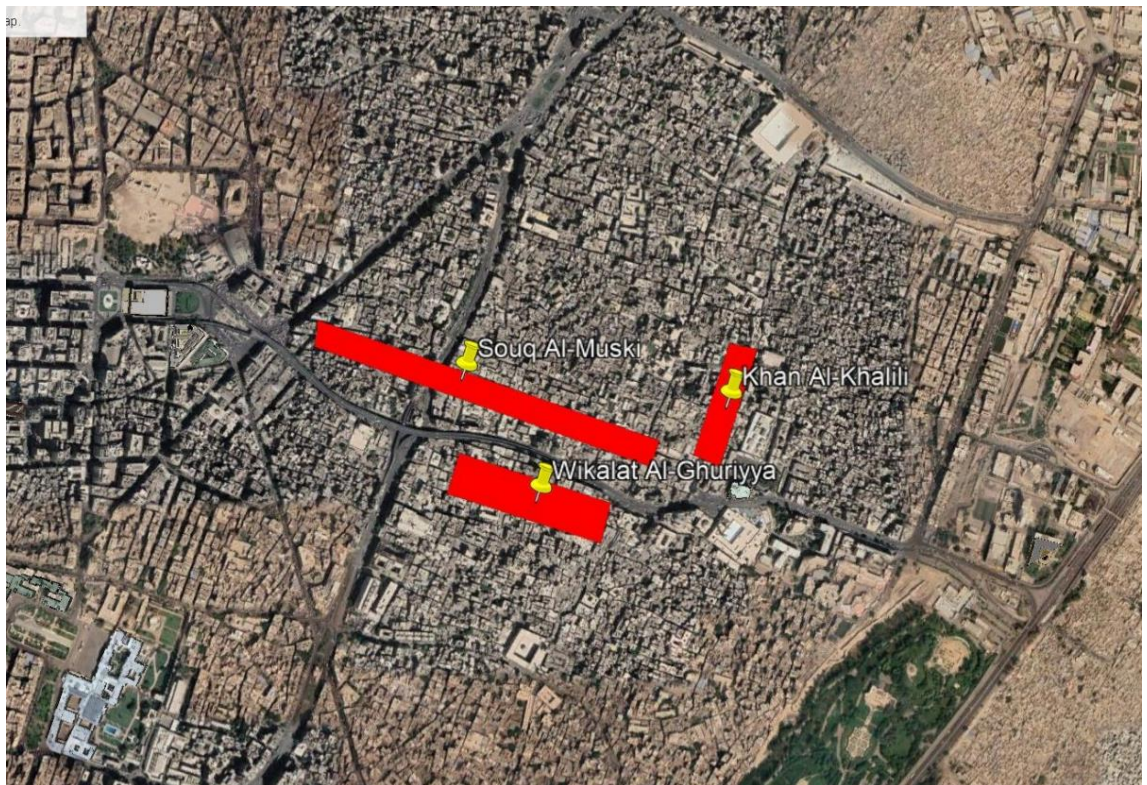


Map 1- Souq Al-Tunsi and Souq Al-Jum’a’s Location (Google Maps, 2020)

¹⁶⁹ The researcher has conducted primary research (observations and interviews) on markets in Cairo city only, not greater Cairo.



Map 3- Souq Al-Imeen and Al-Sayyida Aisha's Location (Google Maps, 2020)



Map 2- Souq Al-Muski, Khan Al-Khalili, and Wikalat Al-Ghuriyya's Location (Google Maps, 2020)



Map 4- Souq Al-Fustat's Location (Google Maps, 2020)

4.4. The Selection of a Public Market in the City of Cairo

Walking and observing the different markets in Cairo¹⁷⁰, the researcher has determined a set of criteria by which a market is chosen for study. The criteria, as shown in table (5), include the area of the market, its permanence/ temporariness, the type of its offered goods, its overall state, and location. Having examined the different Cairene public markets based on the criteria in below table (5), Souq Al-Tunsi has been chosen for study for the following reasons:

- It is a permanent mega-market that is placed on an area of 7.1 feddan.
- It offers various types of goods that grab consumers from different near and far away communities, establishing itself as a popular market nationwide.
- It has a deteriorated urban fabric beside being exposed to many environmental shocks and stresses at a high rate, unlike other public markets.
- It is placed in a very critical urban space, where it lies under Al-Tunsi bridge overlooking the cemeteries, so it has a high priority of study over other markets.¹⁷¹

¹⁷⁰ The researcher has conducted primary research on markets in Cairo city only, not greater Cairo.

¹⁷¹ Mohamed, H. (2011). *"Under Bridge" as an urban public space in the Egyptian city, Tunisy region-south of Cairo-The case of Souk El-Gom'a* [Master's dissertation, Cairo University]. Faculty of Engineering, Cairo University.

Table 5- A Set of Criteria for Choosing a Public Market for Study

Public markets	Area in feddan ¹⁷²	Permanence/ temporariness	Types of goods	State	Location
Souq Al-Jum'a	5.95	One day Souq	Birds and their accessories, bicycles, lamps, lighting fixtures, tools (carpentry, plumbing, lighting), keys, fans, car spare parts, used electronic devices such as mobile phones, and new and used toys.	A non-maintained urban fabric with no infrastructure systems.	Along Al-Khalaa' street, between the cemeteries.
Souq Al-Tunsi	7.1	Permanent	Furniture, finishing materials such as marble, ceramic tiles, ...etc., electrical devices, aluminum and wooden doors and windows, large metal gates, bathroom fixtures and accessories, other house accessories, and scrap.	A deteriorated urban fabric with no infrastructure. Exposed to several environmental shocks and stresses at a high rate.	Placed in a very critical urban space, where it lies under Al-Tunsi bridge overlooking the cemeteries.
Al-Muski	5.14	Permanent	Clothes, shoes, bags, toys, dishes, home accessories, and kitchenware.	A non-maintained historic urban setting with average quality infrastructure systems.	Placed in Al-Gaysh street enclosed by some khedival buildings.
Al-Azhar St.	2.63	Permanent	Sheets, bed covers, fabrics, bridal garments, and spices.	A maintained historic urban setting with good infrastructure systems.	Placed along Al-Azhar street in Fatimid Cairo.
Khan Al-Khalili	3.74	Permanent	Gold, silver, woodwork, arabesque work, gemstones, shellwork, rosaries, spices, antiques, and books.	A maintained historic urban setting with average quality infrastructure systems.	Placed in Al-Gammaliyya area in Fatimid Cairo.
Souq Al-Itneen	5.24	Permanent	Fruits, vegetables, poultry, meat, and plastic kitchenware.	Averagely maintained urban setting with average infrastructure systems.	Placed in Maglis Ash-Sha'ab street in As-Saqqayin area.
Souq Al-Sayyida Aisha	3.02	Permanent	Fruits, vegetables, meat, fish, spices, kitchenware, clothes, animal and bird food, and pet litter.	A non-maintained urban setting with average quality infrastructure systems.	In Al-Sayyida Aisha street and square in Fatimid Cairo.

¹⁷² A round figure for the area of each Souq was calculated based on the researcher calculations through her primary research study.

4.5. An Eye on the Market

4.5.1. The methodology used for acquiring data

For examining Souq Al-Tunsi and analyzing it, a primary qualitative methodology has been used. This methodology has been based on conducting primary research on Souq Al-Tunsi that included paying nine field study visits to its setting and its surrounding area. These visits were conducted in fall 2020, five visits from morning time to afternoon, and four visits from afternoon to sunset. The nine field study visits included taking footage of the market and its surrounding area, and conducting observations and in-depth interviews with 13 merchants, 3 auxiliary workers, and 5 customers. Another interview was conducted with an urban designer in the ministry of housing, utilities, and urban communities.

The interviews have been based on structured questionnaires that can be found in Appendix D, and the data obtained from the interviews and the observations have been analyzed using thematic analysis. The thematic analysis was based on classifying the data into structured themes relating to the schema and the mode of production model, and they included the following:

- The selling objects of the market and the included spaces: display, storage, and exchange.
- The supply chains and handling of goods inside the market.
- The frequent presence of merchants, auxiliary workers, and a wide array of customers (that includes, children, women, men, elderly, and the disabled).
- The profitability of the market to the merchants and auxiliary workers.
- The positioning and reachability of the market.
- The accessibility of the market to the users and goods.
- The smooth internal circulation and mobility inside the market.
- The average built-up density of the market.
- The management of the market that includes permanent stable operations and continuous maintenance.
- The attractiveness of the market.
- The infrastructure and the urban fabric of the market and its surroundings.
- The role of the market in preserving historic heritage inside/surrounding the market (if there's any).

- The role of the market in integrating communities and tourism attraction.
- The presence/absence of focal points, landmarks, and active public spaces inside/surrounding the market.
- The role of the market as an engine for community life.
- The role of the market in fostering economic development.
- The presence of quality urban life for the market and its surrounding urban spaces.
- The current mode of production (including its elements, relations, and forces) and its physical interpretation on:
 - The existing objects inside the market and its zone of influence.
 - The flow and pattern of people and goods.
- The possibilities of tying the current mode of production to the development of the market and the upgrade of its associated zone of influence.

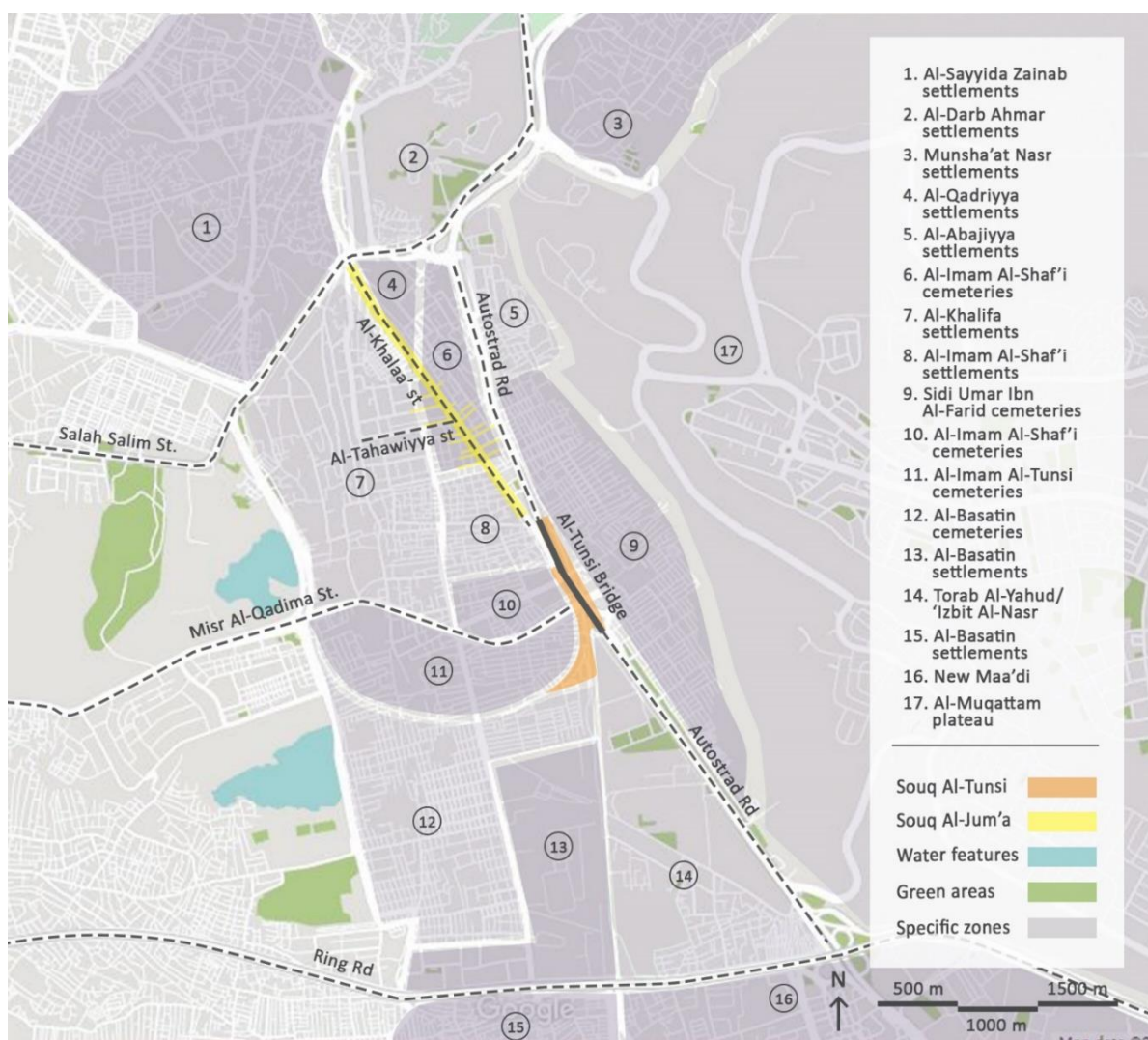
The qualitative methodology used to acquire data about the market has been complemented with secondary research, which is demonstrated in the body of this chapter encompassing additional information about the market and its zone of influence.

4.5.2. Limitations of research

Applying the above qualitative methodology in fall 2020 had its own limitations. Conducting primary research in that time was in parallel with removing parts of Souq Al-Tunsi in preparation for its full relocation, and the COVID-19 pandemic. At this point in time, the whole market was not functioning well as it used to in the time of its normal functioning. This affected the profitability of the market and caused its decline. Thus, the researcher's intervention at this time does not convey a complete picture of the market and showcases the market in its worst case. However, studying the market at this declining state is good for this research as it displays the worst-case scenario of a malfunctioning market. Nonetheless, this is good for testing the development framework, as it is the first demonstration of how the development framework can be applied on a real case study that lacks numerous functions, components, factors, actants, relations, and proper functioning systems. Therefore, the analysis and the proposal of guidelines will be extensive, tackling various components and systems, which would not have been the case if the market was well-functioning.

4.5.3. Location and context

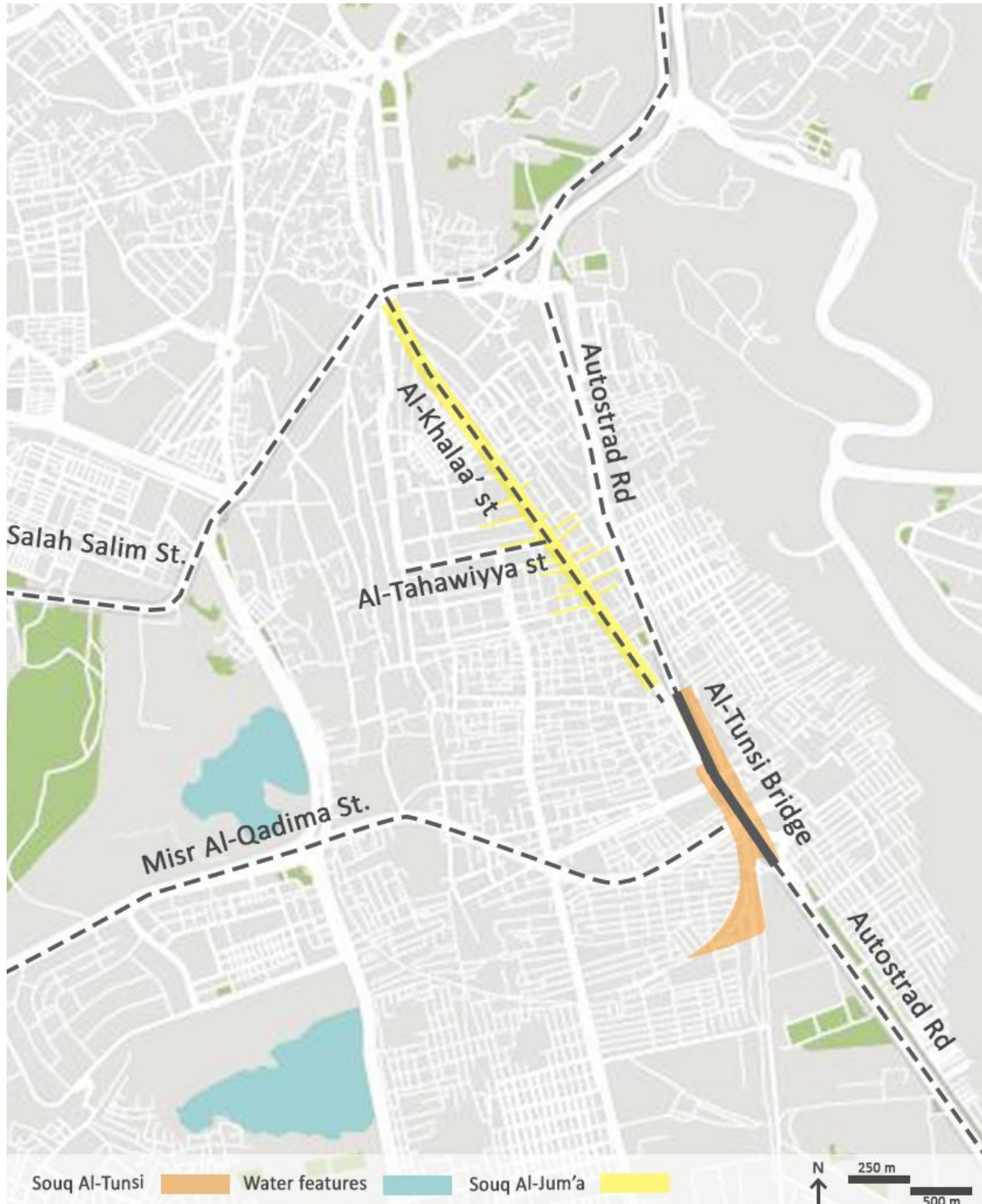
Souq Al-Tunsi lies in Al-Khalifa district in the southeastern part of Cairo Governorate as shown in the following maps (8) and (9). It is located under Al-Tunsi Bridge in Al-Imam Al-Shaf'i's area and extends along the Autostrad road on 800 meters long crossing the two railroad lines (Civil and military) Hilwan- Bab Al-Lu' as shown in the map (5), (6), and (7). On the eastern side of the bridge, the cemeteries of Sidi Umar Ibn Al-Farid lie as well as Al-Hadba Al-Wusta of the city of Al-Muqattam. On the western side of the bridge, the cemeteries of Al-Imam Al-Tunsi and Al-Imam Al-Shaf'i are located as well as the settlements of Al-Imam Al-Shaf'i. Al-Tunsi bridge connects Fatimids Cairo along with Salah Salim's road with the



Map 5- The Location of Souq Al-Tunsi and Souq Al-Jum'a (Author's Illustration)

Ring road, Al-Basatin, and New Ma'adi. Souq Al-Tunsi is also placed near another one-day market *Souq Al-Jum'a*, which operates every Friday and is located along Al-Khalaa' street from the onset of Al-Tunsi Bridge reaching to Masjid Al-Sayyida 'Aisha, as shown in maps

(5) and (6). Souq Al-Tunsi has an approximated area of 7.1 feddan, where it spreads under and around the bridge (the bridge is 800 meters long, 23 meters wide, and has an approximated area of 5.4 feddan) as shown in maps (5) and (6).¹⁷³

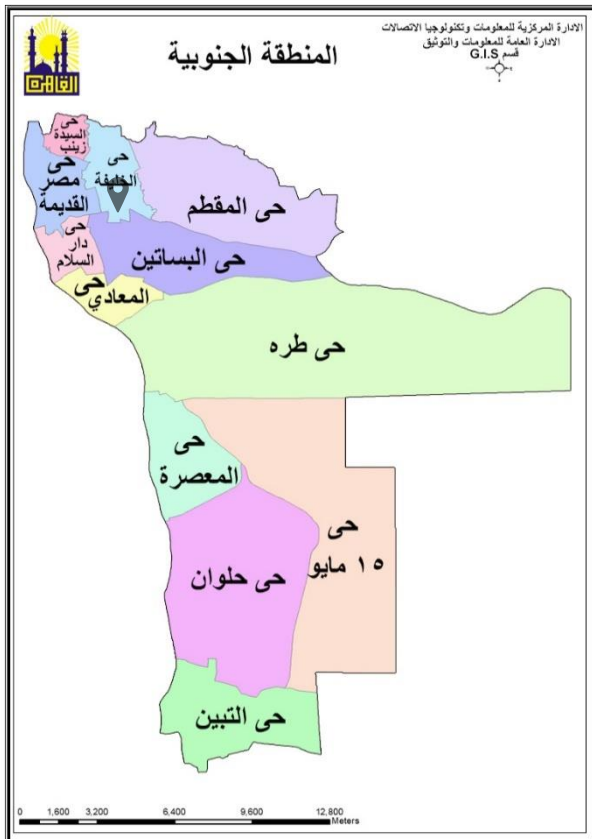


Map 6- Zoomed in map Showing the Location of Souq Al-Tunsi and Souq Al-Jum'a (Author's Illustration)

¹⁷³ Mohamed, (2011), "Under bridge" as an urban public space.



Map 7- The two Railroad Lines With Respect to the Market (Author's Illustration)



Map 9- The Location of Souq Al-Tunsi in the Southern Region of Cairo Governorate map (Cairo Gov, 2021)



Map 8- The Location of Souq Al-Tunsi in Al-Khalifa District map (Cairo Gov, 2021)

4.5.4. History and background

Souq Al- Tunsi has been named after the shrine of Al-Imam Al-Tunsi that overlooks its western side. It started to appear in the mid-80s after the cessation of the public railroad movement due to the inauguration of the subway system Metro Hilwan-Al-Marj and the establishment of the Autostrad road that extended the borders of Old Cairo. The military railroad still operates, however, the public one left an empty space sheltered under the bridge, a spot that became appealing for the merchants in the area, as shown in figure (36). Before the mid-80s, Souq Al-Tunsi was called Souq Al- Jum'a, and it was located in Al-Tahawiyya street nearby Al-Imam Al-Shaf'i's masjid. At this time, Souq Al-Jum'a (the one-day Souq) did not have any existence, however, after the cessation of the public railroad line and the movement of the permanent Souq under Al-Tunsi's bridge, Souq Al-Jum'a started to appear in Al-Khalaa' street every Friday.¹⁷⁴



Figure 36- Souq Al-Tunsi Under the Bridge (Mohamed,2011)

In June 2010, Souq Al-Tunsi was exposed to a great environmental shock, a mega-fire that was caused by a car accident on Al-Tunsi's bridge as shown in figure (37). This mega-fire destroyed more than 60% of the whole market area according to preliminary studies conducted

¹⁷⁴ Mohamed, (2011), "Under bridge" as an urban public space.



Figure 39- Removing Souq Al-Tunsi Under the Bridge (Mohamed, 2011)

The government worked after the mega-fire to:

- Remove all remaining built spaces of the Souq especially the lightweight structures made of wood, straw, and tin.
- Treating the construction problems of the bridge caused by the mega-fire. As shown in figure (40).
- Re-plan the roads and the car parks in the area. ¹⁷⁶



Figure 40-Treating the Construction Problems of the Bridge (Mohamed, 2011)

¹⁷⁶ Mohamed, (2011), "Under bridge" as an urban public space.

In the 25th Jan revolution, with the absence of governance and the security forces, the merchants came back and rebuilt Souq Al-Tunsi under the bridge. With paving the roads and re-planning the whole area after the mega-fire from the government side, the merchants rebuilt the Souq differently this time, where they started to build with bricks, wood, and corrugated sheets, as shown in figures (41) and (42), still, few used wooden columns and straw in covering roofs. The merchants also respected the new road borders which allowed cars to enter and move within the area of the Souq, as shown below in figure (43).¹⁷⁷



Figure 42- The Rebuilt of Souq Al-Tunsi With Bricks (Mohamed, 2011)



Figure 41- Rebuilding Souq Al-Tunsi With Bricks (Mohamed, 2011)

¹⁷⁷ Mohamed, (2011), "Under bridge" as an urban public space.



Figure 43- Respecting the New Road Borders While Rebuilding Souq Al-Tunsi (Mohamed, 2011)

4.5.5. What the market offers

Nowadays, Souq Al-Tunsi is still operating and offering a wide range of goods and commodities. As observed, Souq Al-Tunsi has everything for finishing and furnishing houses, as shown below in figures (44) - (50)¹⁷⁸. According to a merchant in Souq Al-Tunsi, the market was based on selling used goods in the past, but now, it has both new and used commodities, that include the following:

1. Furniture (office and residential)
2. Finishing materials including Marble, ceramic tiles, ...etc.



Map 10- A Keymap Containing all Figures Captured by the Researcher in Souq Al-Tunsi (Author's Illustration)

¹⁷⁸ All figures captured by the researcher in Souq Al-Tunsi are located in the above key map (10).

3. Electrical devices
4. Aluminum Doors and windows
5. Large metal gates
6. Bathroom and kitchen items and accessories
7. Other house accessories
8. Scrap

As revealed in the interviews, the market offered clothes on the civil railroad line before the mega-fire in 2010, but when it was burnt, it no longer displays these types of goods. The market offers the aforementioned listed commodities at cheap prices compared to other formal markets and malls, where what a customer would buy at other formal markets for 50,000 EGP, would be 10,000 EGP in Souq Al-Tunsi with the same quality. Even for the used goods, the merchants ensure that the used goods are in good shape, where they seek to fetch them from good known places. Low-quality goods are also offered in Souq Al-Tunsi for low-income people who cannot afford high prices.



Figure 44- The Display of Wooden Doors and Windows in Souq Al-Tunsi (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 45- The Display of Marble and Ceramic Tiles in Souq Al-Tunsi (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 46- The Display of Furniture in Souq Al-Tunsi (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 47- The Display of Kitchen Ware and Furniture in Souq Al-Tunsi (Author's footage, 2020).
Click [Here](#) for reaching its location on the keymap.



Figure 48- The Display of Children's Bedroom Furniture in Souq Al-Tunsi (Author's footage, 2020).
Click [Here](#) for reaching its location on the keymap.



Figure 49- The Display of Metal Doors, Gates, Kitchen, and Bathroom Fixtures in Souq Al-Tunsi (Author's footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 50- The Display of Aluminum Windows in Souq Al-Tunsi (Author's footage, 2020). Click [Here](#) for reaching its location on the keymap.

Having displayed the wide range of goods that the market offers, the researcher analyzes the market in-depth using the analytical schema in the coming analysis section.

4.6. Souq Al-Tunsi Analysis

4.6.1. Using the schema as the main analytical lens

In order to analyze and understand Souq Al-Tunsi's dynamic components in relation, the analytical schema is used as a guideline for analyzing the market's performance and functioning. Using the schema, with its functions, qualitative components, factors, actants, and relations, the researcher scans the market to evaluate its functionality by the primary research methods conducted in the above section. Using the schema—whose summary can be found below in figure (51)—the researcher looks for the present and the absent functions, factors, components, attributed qualities, actants, and relations that result in poor or incomplete functioning. Meanwhile, the researcher uses the point system of the schema for getting an indicator (not a statistical component) of how much the market is functioning well.

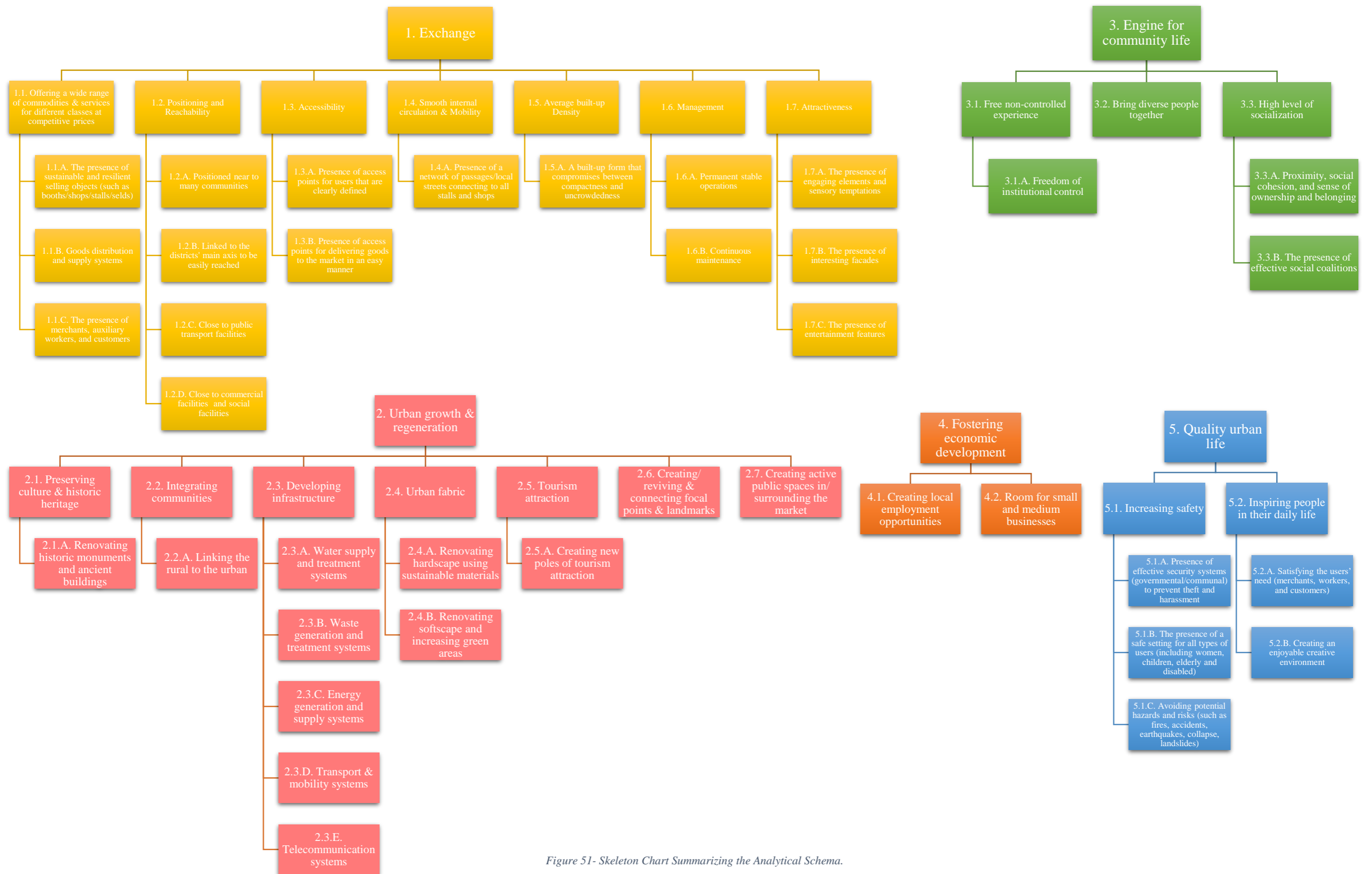


Figure 51- Skeleton Chart Summarizing the Analytical Schema.

4.6.2. Exchange

Picking the first function, exchange, and its first internal factor, offering a wide range of commodities and services, the researcher examines its subfactor: 1.1.A. through studying 1.1.A.1, 1.1.A.2, and 1.1.A.3 and examines whether they are achieved or not in the designated market. This examination is illustrated in the following table (6) and below figure (54).

Table 6- Analyzing Souq Al-Tunsi Using the Schema: the Presence of Selling Objects

Main Function	Components and factors		Whole Points 179	Graded points
1. Exchange	1.1. Offering a wide range of commodities and services for different classes at competitive prices.	1.1.A. The presence of semi-sustainable and resilient selling objects such as shops and stalls.	4	2
		1.1.A.1. Display spaces exist (1 point), but they are not well organized (1/2 point). These spaces are not attractive for the consumers (0 points). Moreover, they are made of bricks/untreated wood, and covered with corrugated sheets/ straw, as shown in figures (52) and (53). Bricks and corrugated sheets are durable and stable, but they are very rigid materials that do not provide much resilience. On the contrary, untreated wood, and straw are less durable and fire hazardous, yet they are very fluid, as they can be easily mantled, reorganized, and dismantled. Untreated wood and straw also have low carbon footprints unlike bricks and corrugated sheets, so they are midway in the sustainability track (1/2 point).		
		1.1.A.2. There are no storage spaces (0 points).	4	0

¹⁷⁹ As noted earlier in section 3.5., the schema provides a **point system** that acts as **an indicator** only (not a statistical component) for determining generally how much a market is functioning well. The point system depends on having 1 point for the presence of the factor/component, and 1 point for each quality attributed to the factor/ component, making the **whole points**. Thus, it is a yes/no component based on the availability or the absence of the factors/components/ attributed qualities. In this section, the scholar is using the point system and is giving **graded points** (based on the data acquired from the conducted primary research methods: the observations and the interviews) to each present component/factor/ attributed quality. Then, the researcher calculates the total number of grade points given to Souq Al-Tunsi divided by the total number of whole points, multiplied by 100 to get a percentage. This percentage provides an indicator of how much the market under study is functioning well.

			1.1.A.3. Proper exchange spaces are not present (0 points).	1	0
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Figure 52- Wood and Corrugated Sheets as Construction Materials in Souq Al-Tunsi as Well as the Display of Furniture (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap



Figure 53-The Use of Straw in Covering Roofs in Souq Al-Tunsi as Well as the Display of Bathroom Fixtures (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap

The present actants and their relationships, for the selling objects in Souq Al-Tunsi, are illustrated in the following¹⁸⁰:

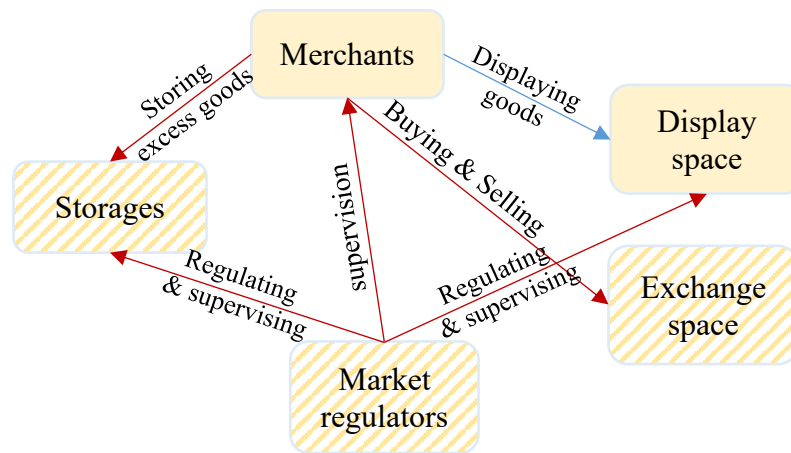


Figure 54- Actants and Their Relationships for the Selling Process (Author's Illustration)

1. The *merchants* display the goods in the *display space*.
2. The *storage* space is absent; therefore, *merchants* cannot store excess goods.
3. The *exchange* space is absent, as a result, *merchants* buy and sell in the *display space*.
4. There are no *Market regulators* (neither governmental nor self-communal), therefore, no regulation or supervision occurs.

Moving on to the second subfactor: 1.1.B. Goods distribution and supply systems, an examination is conducted through studying its internal components: 1.1.B.1 and 1.1.B.2 as shown below in table (7) and figures (55) and (56).

Table 7- Analyzing Souq Al-Tunsi Using the Schema: Goods Distribution and Supply Systems

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	<u>1.1.</u> Offering a wide range of commodities and services for different classes at	<u>1.1.B.</u> Goods distribution and supply systems	<u>1.1.B.1.</u> Merchants (each one alone) fetch their new goods from factories and workshops located in the citadel, Darb Sa'ada, Ayyub, Giza, Moneeb, Damietta, Munufiyya, and other places. Used goods are being	3	1.5

¹⁸⁰ Note 1: Solid filled rectangles indicate the presence of that actants while hatched rectangles indicates the absence of the actants.

Note 2: Blue straight arrows denote the presence of a direct relation, while blue dashed arrows denote the presence of an indirect relationship

Note 3: Red straight arrows indicate the absence of a direct relation, while red dashed arrows denote the absence of an indirect relationship.

	competitive prices.		collected by <i>Rubabiqiyya</i> persons who wander in residential areas looking for used goods that they can buy. <i>Rubabiqya</i> persons then either come to Souq Al-Tunsi and sell it to the merchants or they sell it to warehouses and storages such as the ones located at Izbit Abu Hashish, Arba'a Wi Nus in El-Wayli, Ghamra, Turab Al-Yahud, and Ma'adi. Merchants then go and buy from these warehouses. The only supply chain system in Souq Al-Tunsi is represented in distributing the used goods by the <i>Rubabiqiyya</i> persons to the merchants (1/2 point). This supply system is short and efficient, but since it is done to the used goods only, it, therefore, takes a partial grade (1 point).		
			1.1.B.2. Handling of goods inside the market to reach to the shops is done in the main street overlooking the market without the presence of private service lanes (1 point).	2	1

The current actants and their relationships are represented in the following:

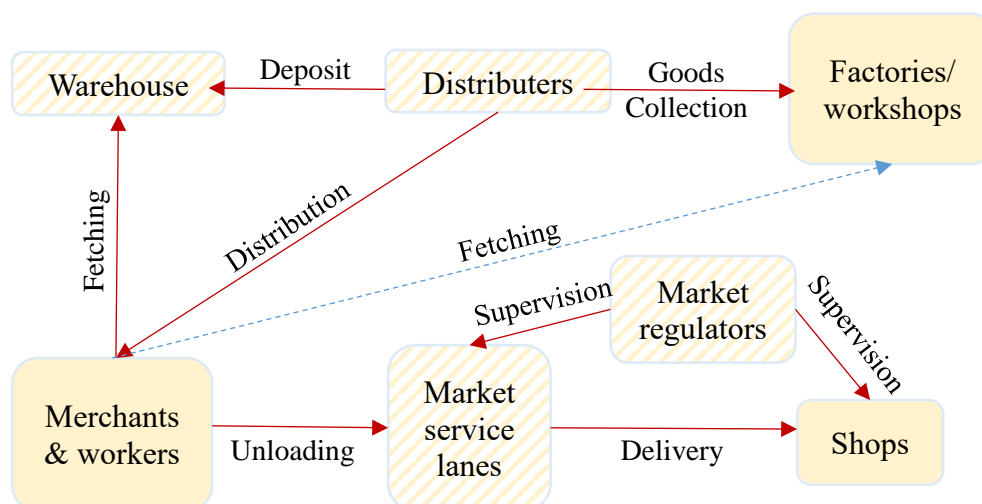


Figure 55- Actants and Their Relationships for New Goods' Distribution and Supply Systems (Author's Illustration)

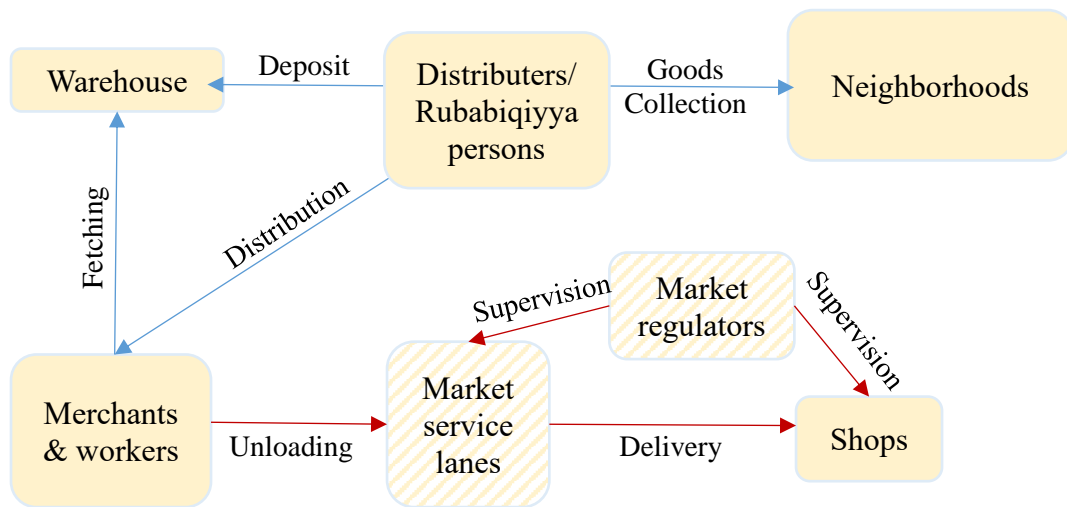


Figure 56- Actants and Their Relationships for Used Goods' Distribution and Supply Systems (Author's Illustration)

1. There are no *market service lanes*, therefore unloading of goods occurs in the main street exposing consumers to potential risks.
2. *Market regulators* are absent; therefore, no control is done to what enters the *shops* and when.

In case of New Goods:

3. *Distributors* are absent; therefore, *merchants* go and fetch their goods from *factories*, and *workshops*.

In case of Used Goods:

4. The *distributors* (Rubabiqya persons) collect the used goods from *neighborhoods* and distribute them to *merchants*, or they deposit them in a *warehouse* where the *merchants* can fetch the goods from.

The third subfactor: 1.1.C. the presence of merchants and auxiliary workers, along with its internal components: 1.1.C.1 and 1.1.C.2. is being examined as shown below in table (8) and figure (57).

Table 8- Analyzing Souq Al-Tunsi Using the Schema. The presence of merchants and auxiliary workers.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	1.1. Offering a wide range of commodities and services for different classes at competitive prices.	1.1.C. The presence of merchants, auxiliary workers, and customers. ¹⁸¹	1.1.C.1. Merchants and auxiliary workers show frequent presence in the market's working hours, which is every day (including weekends) from 8 am to 9 pm (2 points).	2	2
			1.1.C.2. Nowadays, at times of COVID- 19, Merchants and auxiliary workers gain slightly profitable income from the market, unlike the great profits they used to gain in normal working conditions due to the presence of a limited number of customers (0 points).	1	0
			1.1.C.3. A diverse segment of customers (including men, women, and elderly from all over Cairo and upper Egypt) visits the market regularly in normal working conditions and buy goods, that is because the market is a national one that grabs different socioeconomic segments from all over Egypt (1 point).	1	1

The current actants and their relationships are represented in the following:

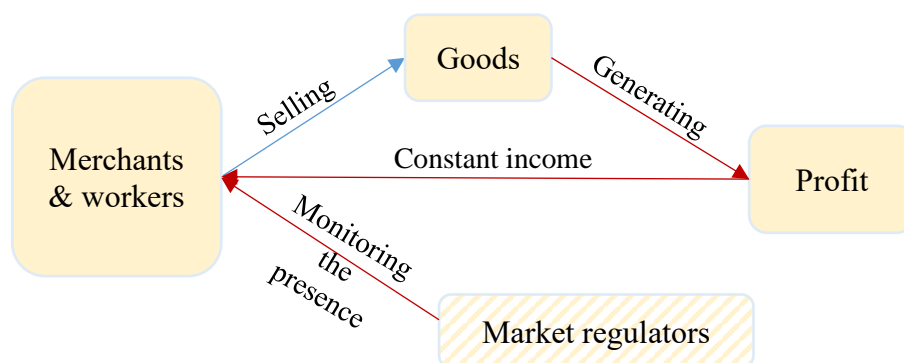


Figure 57- Actants and Their Relationships for the Presence of Merchants and Auxiliary Workers (Author's Illustration).

¹⁸¹ A full profile of the market users is illustrated in the analysis using the mode of production model in section 4.6.7.

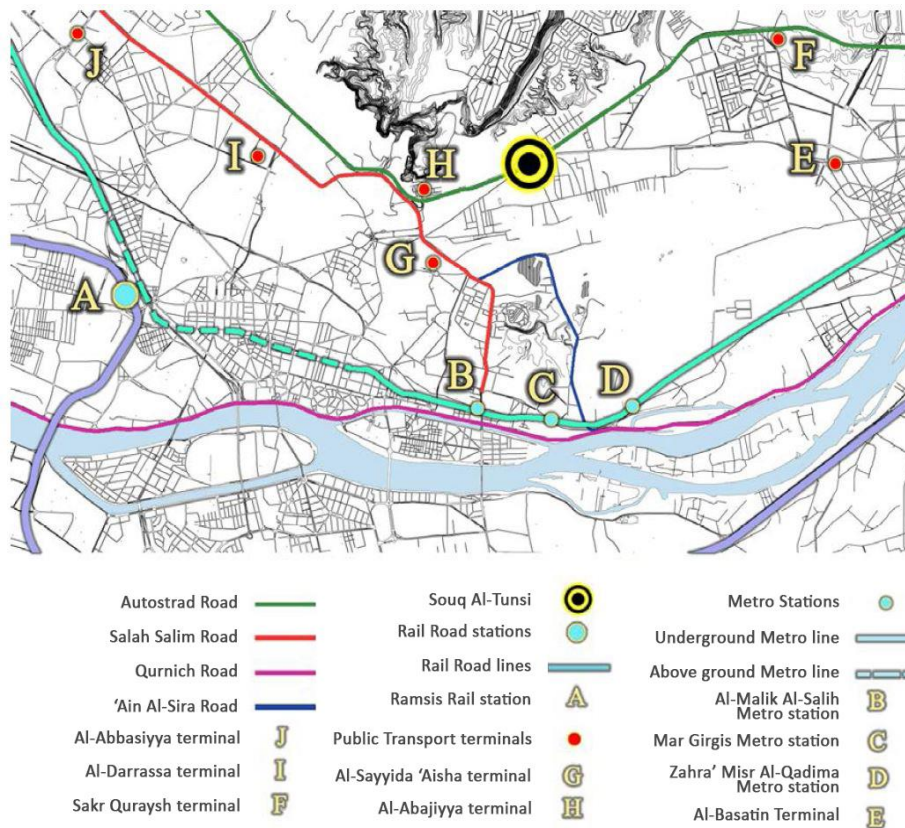
1. The *market regulators* are absent; therefore, none supervises and monitors the presence of the *merchants and workers* in the working hours of the market.
2. The *merchants and workers* sell *goods*.
3. *Goods* generate slight *profit* and, this profit generates low income for the *merchants and workers*.

Having finished the three subfactors inside factor 1.1., the research continues to examine the second factor: 1.2 positioning and reachability for Souq Al-Tunsi as shown in table (9) and figure (58).

Table 9- Analyzing Souq Al-Tunsi Using the Schema. Positioning and reachability.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	1.2. Positioning and reachability	1.2.A. Positioned near to many communities	1.2.A.1. This market is national, customers come from everywhere all over Cairo and Upper Egypt. That is because the market is tied to the surrounding districts' main axes Salah Salim and the Ring Road, as formerly shown in the map (5), this tie links the market easily to various communities in and outside Cairo, so the market can be considered close to the customers' communities since it is easily reachable (1 point).	1	1
			1.2.A.2. The market is close to the merchants' and other workers' residences, where the majority lives in Al-Imam Al-Shaf'i, Izbit Abu Dil, Turab Al-Yahud, Izbit Abu Hashish, Arba'a Wi Nus in Nasr city, Al-Wayli, and Al-Ma'sara. Some merchants and workers come from Al-Minya, Bani Suwif, Al-Qalyubiyya, and Al-Fayoum outside of Cairo and reside next to the Souq, or inside the Souq in small rooms inside the shops (2 points).	2	2

		1.2.B. The market is linked to the districts' main axis (Salah Salim and the Ring Road), and is easily reachable through them, as shown in map (5) (1 point).		1	1
		1.2.C. The market is close to public transport facilities as shown below in map (11) (1 point).		1	1
		1.2.D. The market is not close to any commercial and social facilities (0 points).		2	0



Map 11-The Proximity of the Market to Public Transport Facilities (Mohamed,

The current actants and their relationships are represented in the following:

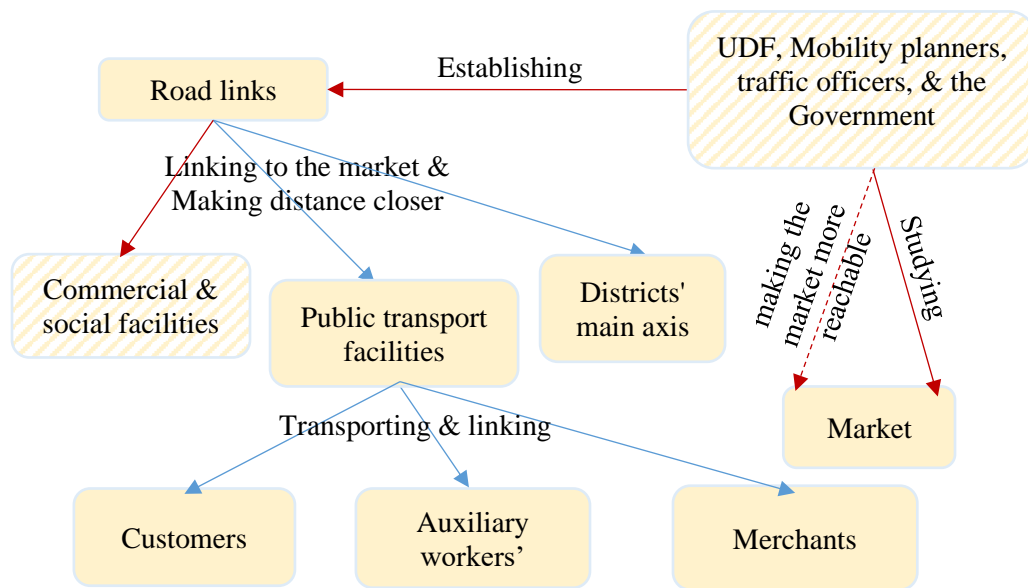


Figure 58- Actants and Their Relationships for the Presence of Merchants and Auxiliary Workers (Author's Illustration).

1. The role of the *mobility planners* and *traffic officers*, in coordination with *the Ministry of Housing, Utilities, and Urban Development*, is still absent in studying the market and making it more reachable by establishing *road links*.
2. Although the role of the *ministry* is absent, the market is linked to roads that connect it to the *districts' main axis* and *public transport facilities* only, with no links to any *commercial and social facilities*.
3. *Public transport facilities* transport *customers, merchants, and auxiliary workers* from their communities to the *market*.

The third and fourth factors: 1.3. and 1.4. is about the accessibility, and the smooth internal circulation and mobility inside the market, these two factors are analyzed as shown in table (10) and figure (60).

Table 10- Analyzing Souq Al-Tunsi Using the Schema. Accessibility, and smooth internal circulation and mobility.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	<u>1.3.</u> Accessibility	<u>1.3.A.</u> Currently, there are two access points for users at Souq Al-Tunsi, one after the onset of the bridge under it, and one at its end as shown in figure (59) (1 point). These access points are not clearly defined (0 points).		2	1

		<u>1.3.B.</u> There is no easy access for deliveries to the market since there are no access points for goods, service lanes, and unloading decks (0 points).	2	0
	<u>1.4.</u> Smooth internal circulation and Mobility	<u>1.4.A.</u> There is a network of passages and local streets connecting to all stalls and shops (2 points).	2	2



Figure 59- The Second Access Point of Souq Al-Tunsi After the end of the Bridge (Author's footage, 2020). Click [Here](#) for reaching its location on the keymap.

The current actants and their relationships are represented in the following:

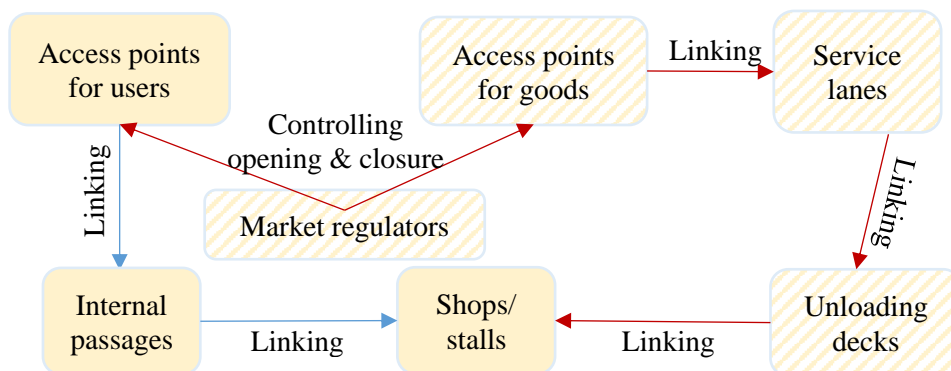


Figure 60- Actants and Their Relationships for Accessibility, and Smooth Internal Circulation and Mobility. (Author's Illustration).

1. *Market regulators* are absent; therefore, no regulation or control is done on the opening and closure of the *access points*.
2. *Access points for users* (although not clearly defined) link the users to the *internal passage*, which in turn connects the users to the *shops and stalls*.
3. *Access points for goods, service lanes, and unloading decks* are absent, therefore the goods share with the users the *access points* and the *internal passages*.

The fifth factor: 1.5, is about the average urban density of the market and it is studied in below table (11) and figure (61).

Table 11- Analyzing Souq Al-Tunsi Using the Schema. Average urban density.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	1.5. Average built-up Density	1.5.A. The built-up form of the market is made of ground-floor shops and a few mezzanine floors, where it spreads horizontally in the area. The form is dispersed rather than being concentrated and it contains a single-use, therefore the form is not compact as shown in figure (62) (0 points). Due to the dispersion of the market on 7.1 feddan and the new planning of the area after the fire to accommodate for wide spaces for roads and used lands, the market is uncrowded (1 point).		2	1

The current actants and their relationships in Souq Al-Tunsi are represented in the following:

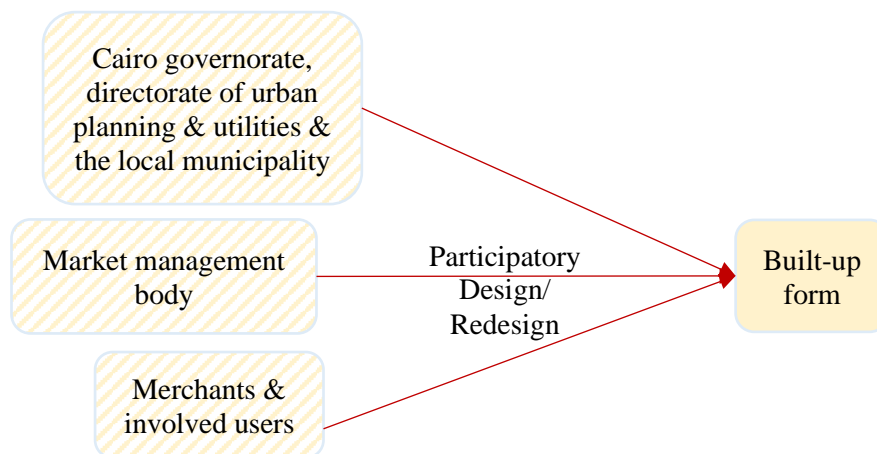


Figure 61- Actants and Their Relationships for Average Urban Density (Author's Illustration).



Figure 62- The non-Compact Uncrowded Form of Souq Al-Tunsi (Author's footage, 2020).
Click [Here](#) for reaching its location on the keymap.

1. The Cairo governorate, directorate of urban planning and utilities, and the local municipality are present, however, their role is absent, therefore no coordination occurs between them and the merchants, involved user, and the market management body (which is also absent), thus participatory design or redesign for the built-up form is missing due to the lack of collaboration between the aforementioned actants.

Moving on to the sixth factor, 1.6. Management, a detailed study for its first internal component, 1.6.A. Permanent stable operations, is conducted below in table (12) and figure (63).

Table 12- Analyzing Souq Al-Tunsi Using the Schema. Permanent stable operations.

Main Function	Components and factors				Whole Points	Graded points
1. Exchange	<u>1.6.</u> Management	<u>1.6.A.</u> Permanent stable operations	<u>1.6.A.1.</u> Operations of market rules and regulations	<u>1.6.A.1.1.</u> The market has stable working hours, yet without market regulators, since there is a weakened	2	2

				communal leadership in the market, especially after the mega-fire ¹⁸² (2 points).		
				<u>1.6.A.1.2</u> There are no rental and stall-allocation policies, and thus, no application (0 points).	2	0
				<u>1.6.A.1.3</u> There are no fees or taxes collected except for a small amount of money that is paid monthly for the electricity company as a reconciliation of the electricity used informally. Other sums of money are also paid informally to policemen (1 point).	2	1
				<u>1.6.A.1.4.</u> There is no security and traffic control (0 points).	2	0
				<u>1.6.A.1.5.</u> There is no enforcement of environmental, public health and food safety requirements (0 points).	3	0
				<u>1.6.A.1.6.</u> There is no hygiene control and product inspection (0 points).	2	0
				<u>1.6.A.1.7.</u> There is not any entity (nor governmental since it is an informal market, nor communal due to the presence of a weakened communal leadership) that keep	1	0

¹⁸² More info about Souq Al-Tunsi's leaders are found in section 4.6.4.

				public order (0 point).		
			1.6.A.2. There is no administration and records keeping (0 point).		2	0

The current actants and their relationships in Souq Al-Tunsi are represented in the following:

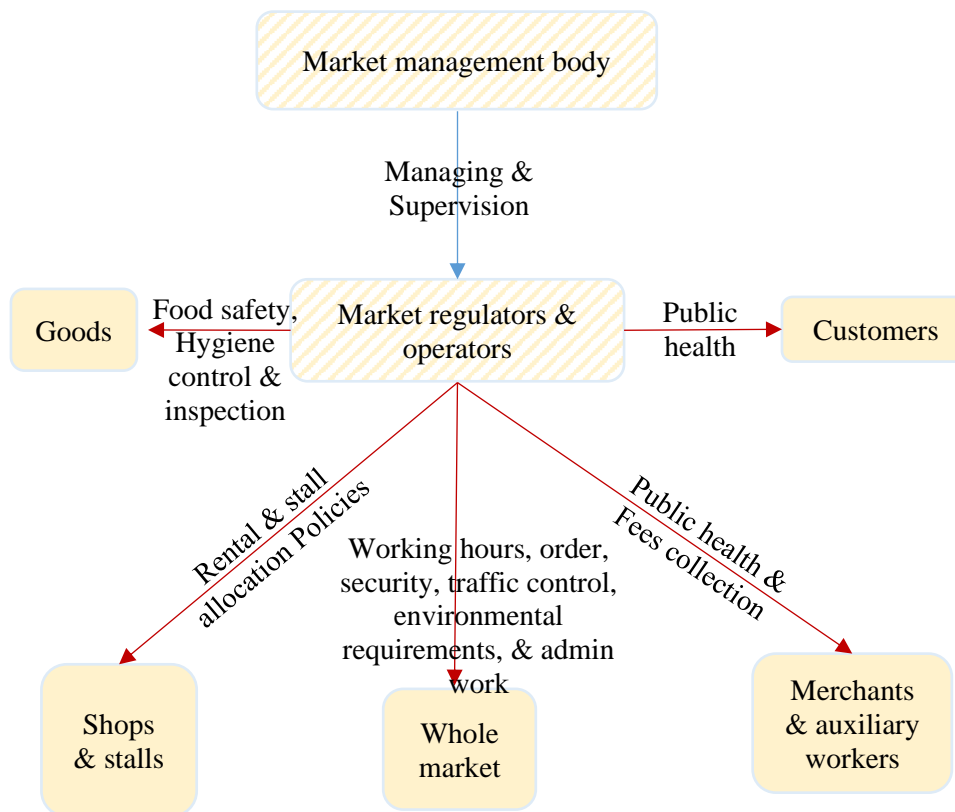


Figure 63- Actants and Their Relationships for Permanent Stable Operations (Author's Illustration).

1. There is not a *market management body* (neither communal nor governmental) whose role entails managing and supervising the *market regulators and operators*.
2. *Market regulators and operators* are absent, therefore nobody:
 - Ensures food safety, hygiene control, and product inspection for *goods*.
 - Applies rental and stall allocation policies for *shops and stalls*.
 - Ensures stable working hours, order, security, traffic control, and enforcement of environmental requirements inside the *whole market*.
 - Collects fees and taxes from *merchants and auxiliary workers* and keeps public health.

The second component in the management factor is 1.6.B. continuous maintenance. It is examined inside the market in the following table (13) and below figure (64).

Table 13- Analyzing Souq Al-Tunsi Using the Schema. Continuous maintenance.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	1.6. Management	1.6.B. Continuous maintenance	1.6.B.1. There is no recurrent cleaning for the whole market (0 points).	2	0
			1.6.B.2. There is no continuous improvement of facilities and used objects (0 points). Except that when the whole market was burnt the government re-planned it and the merchants rebuilt it with more durable materials.	2	0

The current actants and their relationships in Souq Al-Tunsi are represented in the following:

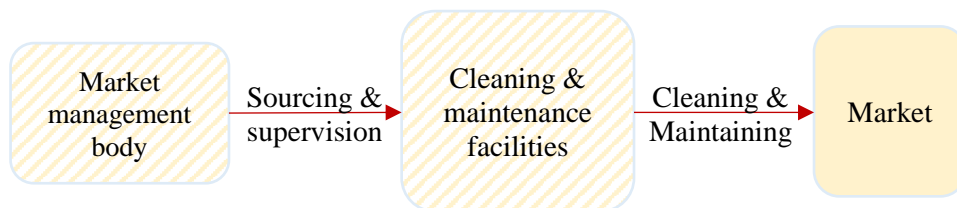


Figure 64- Actants and Their Relationships for Continuous Maintenance (Author's Illustration).

1. The market management body is absent, therefore nobody sources or supervises the cleaning and maintenance body, whose role entails cleaning and maintaining the market.

The last factor in the exchange process circulates about the attractiveness of the market. It is studied in the below table (14) and figure (65).

Table 14- Analyzing Souq Al-Tunsi Using the Schema. The attractiveness of the market.

Main Function	Components and factors			Whole Points	Graded points
1. Exchange	1.7. Attractiveness	1.7.A. The market is very plain, where there are no engaging seductive elements and sensory temptations (0 points).		2	0
		1.7.B. The absence of interesting facades (0 points).		1	0
		1.7.C. There are no entertainment features (0 points).		1	0

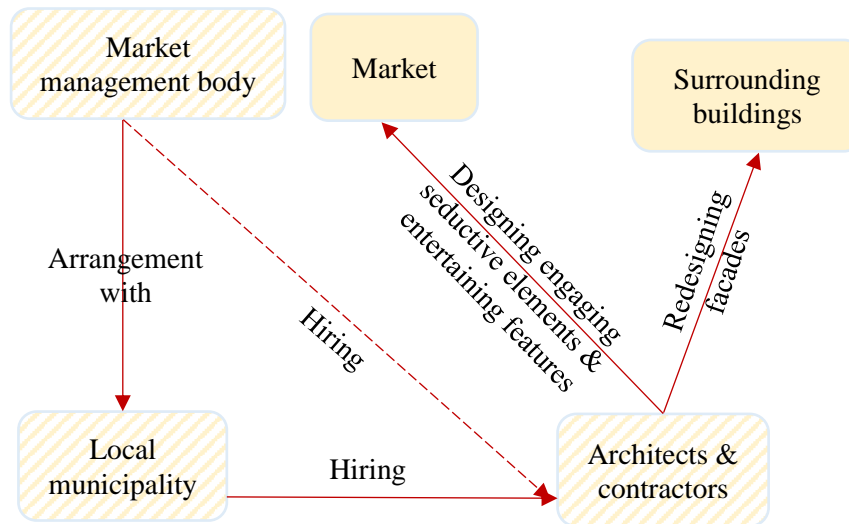


Figure 65- Actants and Their Relationships for the Attractiveness of the Market (Author's Illustration).

The current actants and their relationships, for the attractiveness of Souq Al-Tunsi, are represented in the following:

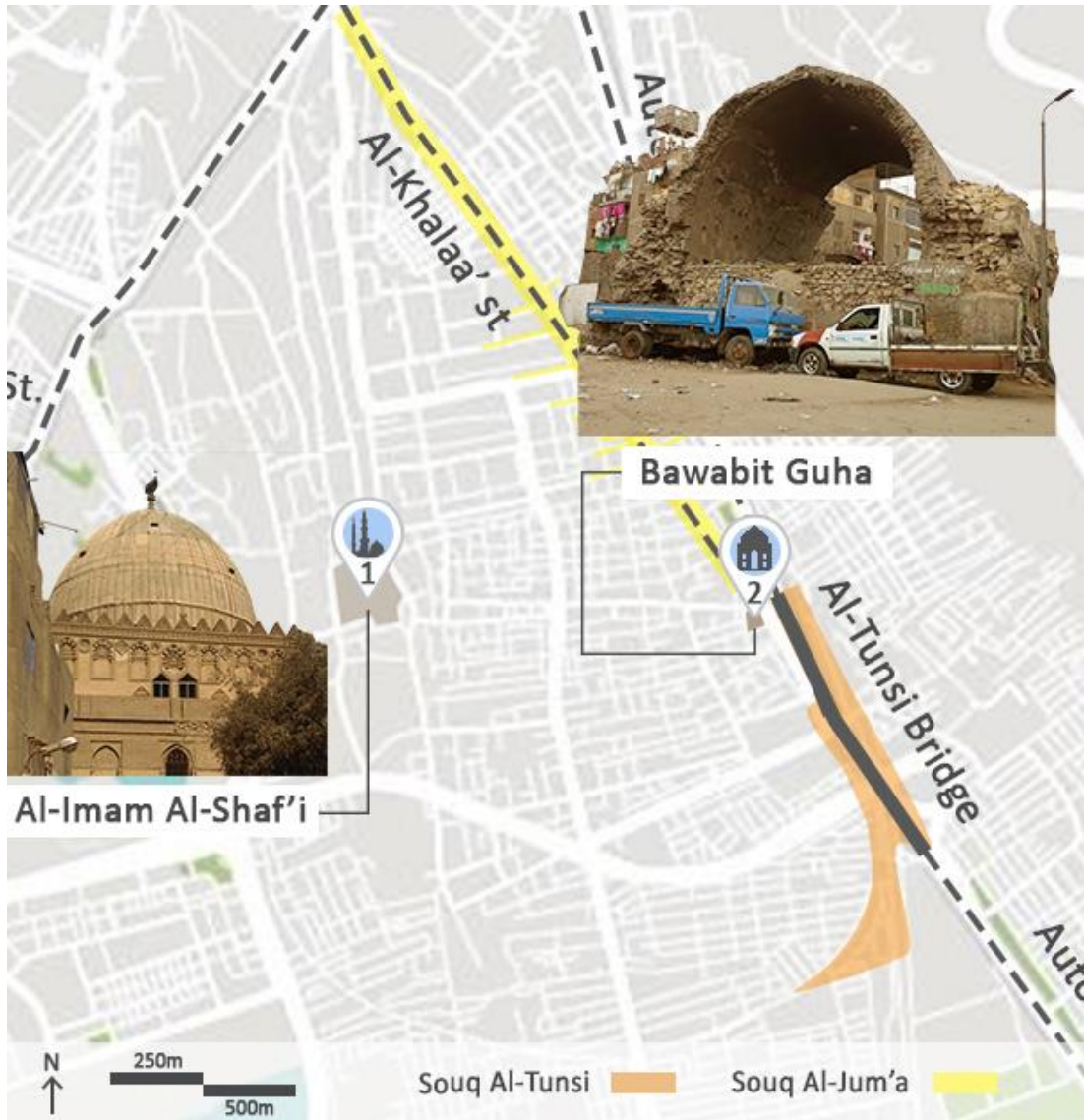
1. There is not a *market management body*, thus none arranges with the *local municipality* for hiring *architects and contractors* to revive the *market* by designing engaging seductive elements and entertaining features and redesigning the facades of the *surrounding buildings*.

4.6.3. Urban growth and regeneration

Tapping on the second function: urban growth and regeneration, an analysis is conducted on its first component: preserving culture and historic heritage, in the following table (15) and below figure (66).

Table 15- Analyzing Souq Al-Tunsi Using the Schema. Preserving culture and historic heritage.

Main Function	Components and factors		Whole Points	Graded points
2. Urban growth and regeneration	2.1. Preserving culture and historic heritage	2.1.A. There are few Renovations for the surrounding historic monuments and ancient buildings like the restoration of Al-Imam Al-Shaf'i which is 824 meters away from the market. However, there are other closer monuments that are left in a deteriorated state, like Bawabit Guha which is directly overlooking the market as shown in the below map (12) (1 point).	2	1



Map 12- Historic Monuments Around Souq Al-Tunsi (Author's Illustration).

The current actants and their relationships, for preserving culture and historic heritage around the market, are represented in the following:

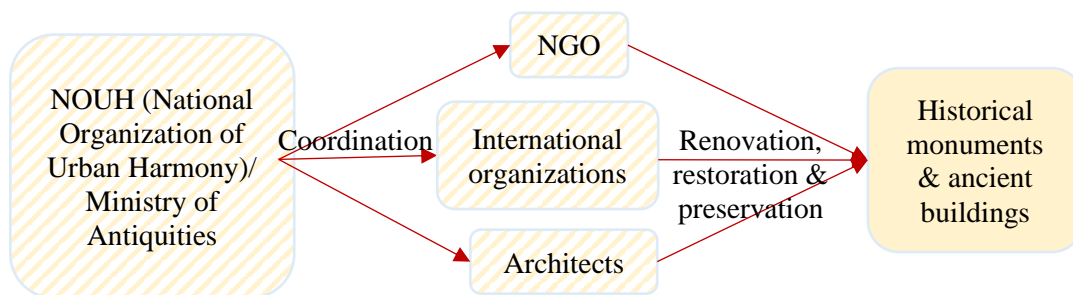


Figure 66- Actants and Their Relationships for Preserving Culture & Historic Heritage Around the Market (Author's Illustration).

1. *NOUH (National Organization of Urban Harmony)/Ministry of Antiquities' role* is not that effective, therefore, there is limited coordination with *architects/NGOs/international organizations* who are concerned with preservation for renovating and restoring *historical monuments and ancient buildings*.

Moving on to the second component: 2.2. that revolves around integrating communities, an examination is conducted through studying its internal components: 2.2.A. and 2.2.A.1 as shown in below table (16) and figure (67).

Table 16- Analyzing Souq Al-Tunsi Using the Schema. Integrating communities.

Main Function	Components and factors			Whole Points	Graded points
2. Urban growth and regeneration	2.2. Integrating communities	2.2.A. Linking the rural to the urban	2.2.A.1. Some goods from rural areas outside of Cairo (like Damietta, and Al-Munufiyya) are delivered to the market. (1 point). Furthermore, the market offers stalls for merchants outside of Cairo, where merchants from Al-Minya, Bani Suwif, Al-Qalyubiyya, and Al-Fayoum sell in the market and reside in it (1 point).	2	2

The current actants and their relationships, for integrating communities around the market, are represented in the following:

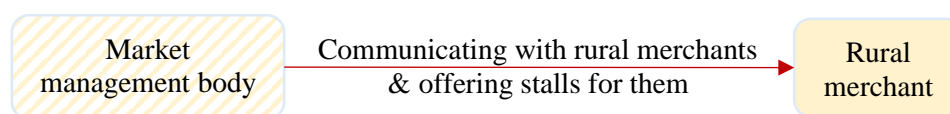


Figure 67- Actants and Their Relationships for Integrating Communities (Author's Illustration).

1. There is not a *market management body* that communicates with the *merchants* in the surrounding rural communities and offers stalls for them, however, this is done in the market naturally, since it is an informal market, and most of the surrounding population comes from rural areas.

The third component: 2.3. Developing infrastructure comprises various internal components starting with 2.3.A. Water supply and treatment systems. This internal component along with its subdivisions is studied as shown below in table (17) and figure (68).

Table 17- Analyzing Souq Al-Tunsi Using the Schema. Water supply and treatment systems.

Main Function	Components and factors			Whole Points	Graded points	
2. Urban growth and regeneration	2.3. Developing infrastructure	2.3.A. Water supply and treatment systems	<u>2.3.A.1.</u> There are no clean water systems supplied to the market. When the users of the market need water, they fetch it from the nearest mosque or street water dispensers (0 points).		2	0
			<u>2.3.A.2.</u> Minimizing freshwater consumption	<u>2.3.A.2.1.</u> There is no supply of water to the market, thus the use of sensors/ other reductive techniques is not applicable (0 points).	1	0
			<u>2.3.A.3.</u> Recycling used water	<u>2.3.A.3.1.</u> There is not a sewage system in the market, so the use of a greywater system is not applicable (0 points).	1	0
				<u>2.3.A.3.2.</u> There is not a black water system for the market, so the treatment of the system is not applicable. (the market's users use a trench	1	0

				system instead where they dig trenches under their toilets) (0 points).		
				<u>2.3.A.3.3.</u> There is not a harvested rainwater system (0 points).	1	0

The current actants and their relationships, for Water supply and treatment systems in the market, are represented in the following:

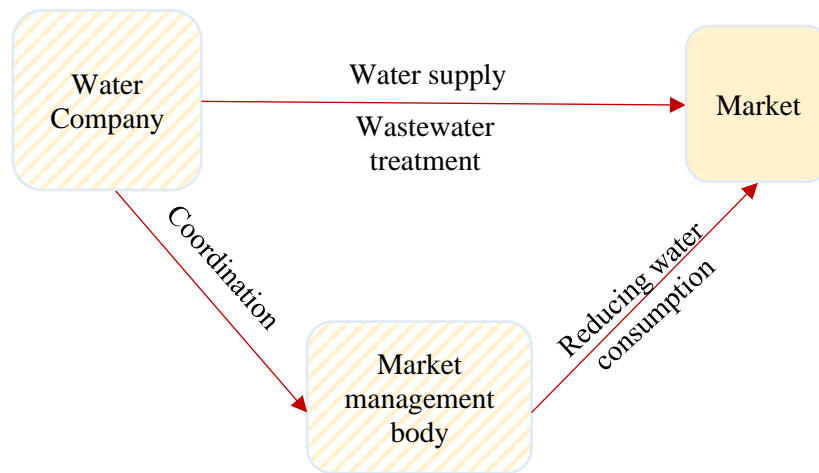


Figure 68- Actants and Their Relationships for Water Supply and Treatment Systems (Author's Illustration).

1. The Water company in Egypt, Holding Company for Water and Wastewater, the HCWW, does not provide the market with water supply systems and water treatment systems in the market.
2. The market management body is absent, besides there is not a water supply system in the market thus, reducing water consumption inside the market is not applicable.

The second internal component inside “Developing the infrastructure” is 2.3.B. Waste generation and treatment systems. This internal component along with its subdivisions is studied as shown in the below table (18) and figure (71).

Table 18- Analyzing Souq Al-Tunsi Using the Schema. Waste generation and treatment systems.

Main Function	Components and factors		Whole Points	Graded points	
2. Urban growth and regeneration	2.3. Developing infrastructure	2.3.B. Waste generation and treatment systems	2.3.B.1. There is no solid waste collection, where waste and scrap are disposed on the sides of the market and besides the railroad line, as shown in figures (69) and (70), (0 points).	1	0
			2.3.B.2. There is no waste reduction (0 points).	1	0
			2.3.B.3. There is no waste recycling (0 points).	1	0



Figure 69- Disposed Garbage in Landfills at the Sides of Souq Al-Tunsi (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 70- Disposed Garbage Besides the Railroad Line Inside Souq Al-Tunsi (Author's footage, 2020).
Click [Here](#) for reaching its location on the keymap.

The current actants and their relationships, for the waste generation and treatment systems in the market, are represented in the following:

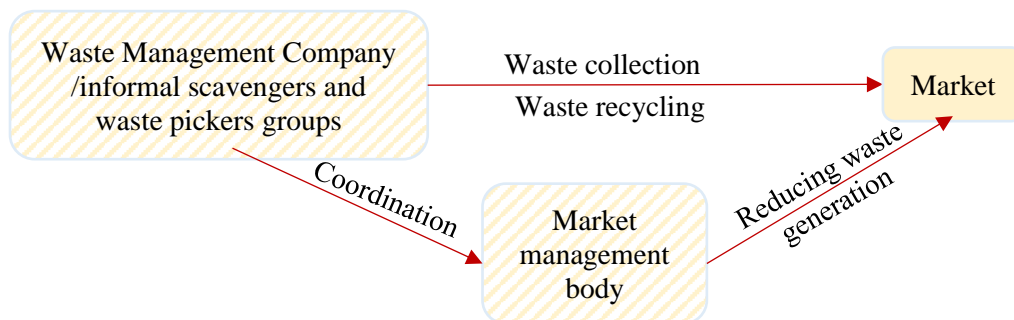


Figure 71- Actants and Their Relationships for Waste Generation and Treatment Systems (Author's illustration).

1. The role of *The Waste management company* represented in the *General Authority for Cleanness and Beautification* and the role of the *informal scavengers and waste pickers* are absent thus, none works on collecting waste from the *market* or recycling it; as a result, merchants use the sides of the market as landfills for disposing and burning their garbage as illustrated in the previous figure (69).
2. Since its role is absent (the *General Authority for Cleanness and Beautification and informal waste pickers*) therefore, none coordinates with the *market management body* (which is also missing) for reducing the waste generated inside the *market*.

The third internal component inside “Developing the infrastructure” is 2.3.C. Energy generation and supply systems. This internal component along with its subdivisions is studied as shown in the below table (19) and figure (74).

Table 19- Analyzing Souq Al-Tunsi Using the Schema. Energy generation and supply systems.

Main Function	Components and factors			Whole Points	Graded points				
<p>2. Urban growth and regeneration</p>	<p><u>2.3.</u> Developing infrastructure</p>	<p><u>2.3.C.</u> Energy generation and supply systems</p>	<p><u>2.3.C.1.</u> There is no supply of energy (not from renewable sources or even non-renewable sources) inside the market. The merchants, however, use the electricity informally by pulling wires from the nearby residential neighborhoods and the bridge to light their shops, as shown in figures (72) and (73), (0 points).</p>		2	0			
			<p><u>2.3.C.2.</u> There is no minimizing of the use of fossil fuel energies (0 points).</p>					1	0
			<p><u>2.3.C.3.</u> Reducing energy uses</p>				<p><u>2.3.C.3.1.</u> There is no reduction in heating and cooling loads using passive energy-saving techniques. As a matter of fact,</p>	1	0

				there is no energy supply to the market thus the heating and cooling loads are negligible, still, the market is in dire need of passive energy-saving techniques for the harsh weather in summer and winter (0 points).		
				<u>2.3.C.3.2.</u> There is no usage of energy-efficient appliances (0 points), only energy-efficient lighting fixtures are used, as shown in figure (73), (1 point).	2	1



Figure 72- Pulling Wires From the Nearby Residential Neighborhoods and the Bridge to Supply Souq Al-Tunsi With Electricity (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 73- Lighting the Shops with LED Lights (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

The current actants and their relationships, for energy generation and supply systems in the market, are represented in the following:

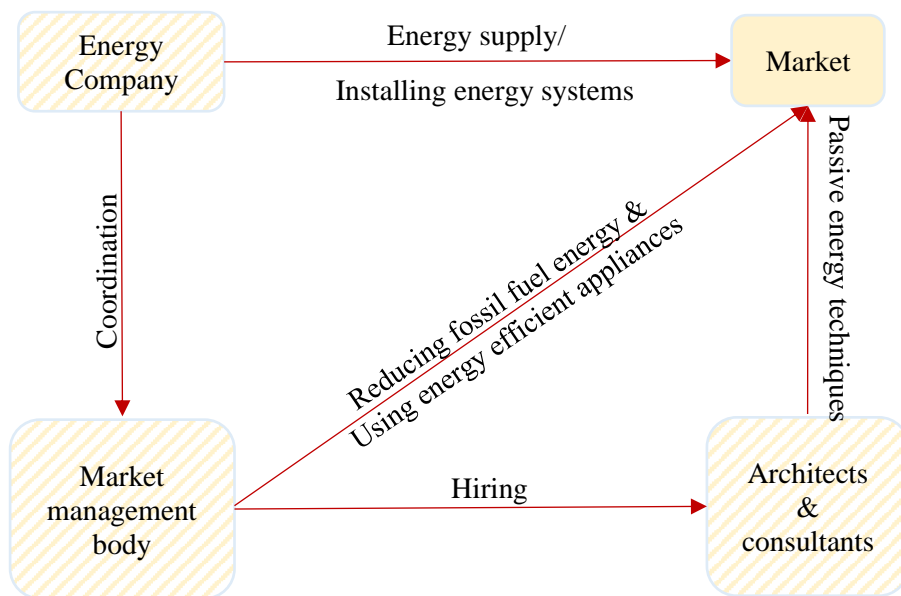


Figure 74- Actants and Their Relationships for Energy Generation and Supply Systems (Author's Illustration).

1. *The Energy Company*, represented in *The Egyptian Electricity Holding Company*, does not supply clean energy to the *market* and thus there is no installation of renewable energy systems inside the *market*.

2. *The Egyptian Electricity Holding Company's* role is absent, therefore, there is no coordination with the *market management body*, which is also absent, for reducing fossil-fueled energy and using energy-efficient appliances. However, merchants use energy-efficient lighting, but only for the sake of using less electricity, since the informally pulled electricity wires do not transmit big loads of electricity.
3. As a result of the absence of the role of *the Energy company* and the *market management body*, nobody is concerned with hiring *architects and consultants* for employing passive energy techniques inside the *market*.

The fourth internal component inside “Developing the infrastructure” is 2.3.D. Transport and mobility systems. This internal component along with its subdivisions is studied as shown in the below table (20) and figure (75).

Table 20- Analyzing Souq Al-Tunsi Using the Schema. Transport and mobility systems.

Main Function	Components and factors			Whole Points	Graded points
2. Urban growth and regeneration	<u>2.3.</u> Developing infrastructure	<u>2.3.D.</u> Transport and mobility systems	<u>2.3.D.1.</u> The market's urban space facilitates non-motorized forms of transport like walking; however, the walking lanes need to be well maintained and paved for a better experience (<i>1/2 points</i>).	1	1/2
			<u>2.3.D.2.</u> Public transport is integrated in a way that facilitates access to the market and reduces private cars, as previously shown in the map (11) in section 4.6.2., (<i>2 points</i>).	2	2

The current actants and their relationships, for transport and mobility systems, are represented in the following:

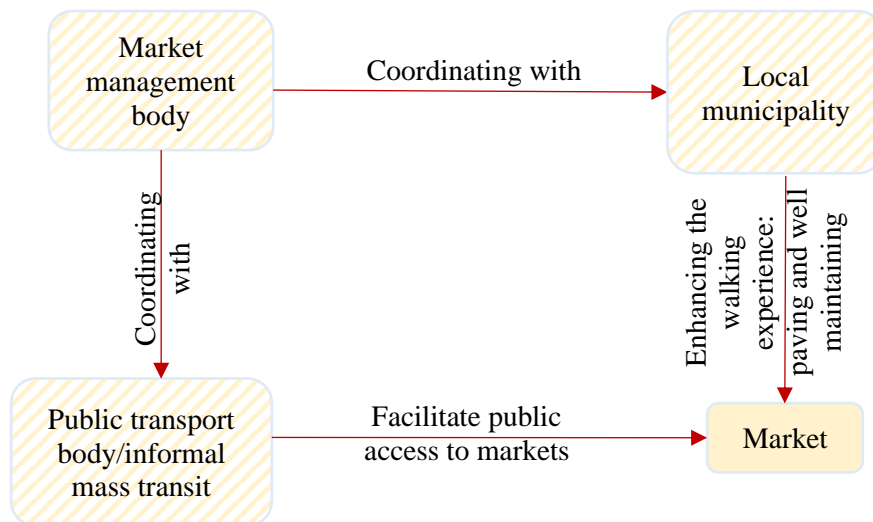


Figure 75- Actants and Their Relationships for Transport & Mobility Systems (Author's illustration).

1. Facilitating non-motorized forms of transport inside the *market* is realized to a good extent, where the market's urban space accommodates walking, but the walking lanes need to be paved and well maintained for a better experience. There is not a *market management body*, therefore, none coordinates with the *local municipality* to well maintain and pave the walking lanes inside and surrounding the *market*.
2. *The market management body* is absent therefore none coordinates with the *public transport body/informal mass transit* to further facilitate public access to the *market* such as putting transport stations at the beginning and the end of *the market*. Note: as shown in the previous map (11), public transport facilitates access to the market, however, adding a stop at the market end/beginning would ensure the optimum public access facilitation.

The fifth internal component inside “Developing the infrastructure” is 2.3.E. Telecommunication systems. This internal component along with its subdivisions is studied as shown in the below table (21) and figure (76).

Table 21- Analyzing Souq Al-Tunsi Using the Schema. Telecommunication systems.

Main Function	Components and factors			Whole Points	Graded points
2. Urban growth and regeneration	<u>2.3.</u> Developing infrastructure	<u>2.3.E.</u> Telecommunication systems	<u>2.3. E.1.</u> There are no telecommunication lines, but there is a poor-average mobile coverage (1/2 points).	1	0

The current actants and their relationships, for the telecommunication systems in the market, are represented in the following:



Figure 76- Actants and Their Relationships for Telecommunication Systems (Author's illustration).

1. The market management body is absent; thus no one coordinates with the Telecommunications Company for supplying the market with telecommunication lines and strengthening the mobile coverage.

Moving on to the fourth component of the urban growth and regeneration function that revolves around the urban fabric, an examination is conducted through studying its internal components: 2.4.A. and 2.4.B. and their subdivisions, as shown below in table (22) and figure (77).

Table 22- Analyzing Souq Al-Tunsi Using the Schema. Renovating the urban fabric using sustainable materials.

Main Function	Components and factors		Whole Points	Graded points	
2. Urban growth and regeneration	2.4. Urban fabric	2.4.A. Renovating hardscape using sustainable materials	2.4.A.1. There is not a special space for the walkways, as they are in the space of the driveways, and some of these spaces are not paved (0 points).	1	0
			2.4.A.2. Some of the driveways are not paved, as shown in the below figure (78), (1/2 points).	1	1/2
			2.4.A.3. There are no benches/ seating (0 points).	1	0
			2.4.A.4. There are no special walls and fences for the market (0 points).	2	0
			2.4.A.5. There are no edgings (0 points).	1	0
			2.4.A.6. There are no pergolas/ patios (0 points).	1	0
			2.4.A.7. There are no water features in or surrounding the market (0 points).	1	0
			2.4.A.8. There is no special lighting for the market (0 points).	1	0



Figure 79- The Presence of Trees Around the Market (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 80- The Presence of Climber Plants and Trees in the Market (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

Moving on to the fifth and the sixth components of the urban growth and regeneration function: 2.5. tourism attraction and 2.6. creating focal points and landmarks for better wayfinding in the market, an examination is conducted through studying their internal components and subdivisions as shown in the below table (23) and figure (81).

Table 23- Analyzing Souq Al-Tunsi Using the Schema. Tourism attraction and creating focal points and landmarks.

Main Function	Components and factors		Whole Points	Graded points
2. Urban growth and regeneration	<u>2.5.</u> Tourism attraction	<u>2.5.A.</u> Creating new poles of tourism attraction	1	0
		<u>2.5.A.1.</u> There is no designing/reviving for new/existing iconic elements in/close to the market (0 points).		

			2.5.A.2. There is no publicizing and advertising for tourism attraction (0 points).	1	0
	2.6. There is no revival and connectivity to the surrounding focal points and landmarks such as Masjid Al-Imam Al-Shaf'i and Masjid Al-Sayyida 'Aisha for better attraction and wayfinding to the market (0 points).			2	0

The current actants and their relationships, for tourism attraction and creating focal points and landmarks, are represented in the following:

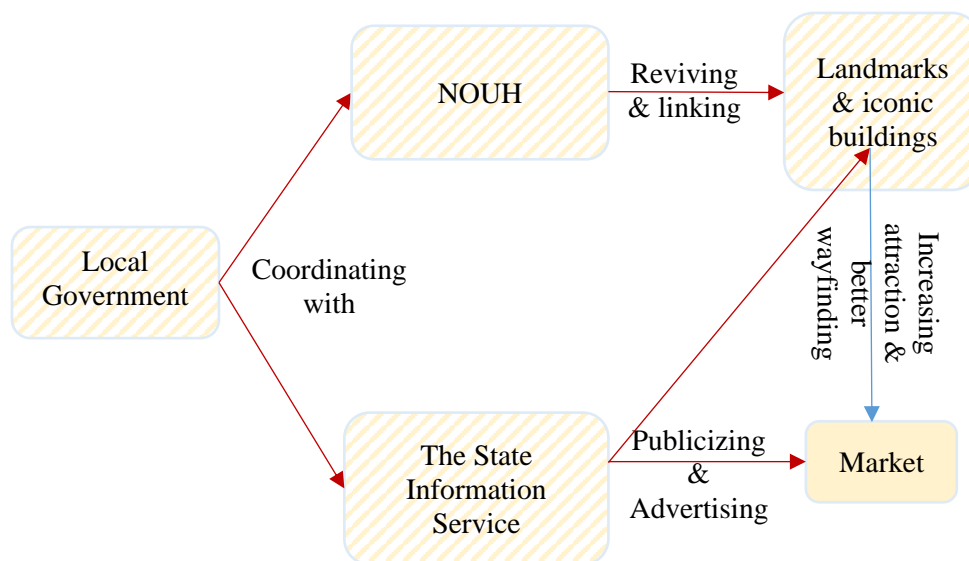


Figure 81- Actants and Their Relationships for Tourism Attraction and Creating Focal Points and Landmarks (Author's Illustration).

1. The local government does not coordinate with the NOUH to revive and link the surrounding landmarks and iconic buildings to the market.
2. The local government does not coordinate with The State Information Service to conduct advertisements for both the proposed to be revived landmarks and iconic buildings and the market.

3. The existing *Landmarks and iconic buildings* are not revived nor linked to the *market*; therefore, nothing increases the attraction for the *market* and contributes to better wayfinding.

The last component of the urban growth and regeneration function is 2.7. Creating active public spaces in and/or surrounding the market. It is examined through studying its internal components as shown in the below table (24) and figure (84).

Table 24- Analyzing Souq Al-Tunsi Using the Schema. Creating active public spaces in and/or surrounding the market.

Main Function	Components and factors			Whole Points	Graded points
2. Urban growth and regeneration	2.7. Creating active public spaces in the market and/or surrounding it.	2.7.A. There are no pavilions (or other similar spaces/structures) in and/or surrounding the market (0 points).		1	0
		2.7.B. There are no gardens/parks in and/or surrounding the market (0 points).		1	0
		2.7.C. There are no restaurants/cafes in and/or surrounding the market, except that there are local coffee shops, <i>Qahwa</i> , near the market and independent food providers in the market whose service does not comply with the public health and hygiene standards, as shown in figure (82) and (83), (0 points).		1	0
		2.7.D. There are no playgrounds/other similar spaces in and/or surrounding the market (0 points).		1	0



Figure 83- A Local Coffeeshop, Qahwa, in Al-Imam Al-Shafi's Settlements Near to Souq Al-Tunsi. Click [Here](#) for reaching its location on the keymap (Author's footage, 2020).



Figure 82- A Woman Providing Food in the Market (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

The current actants and their relationships, for creating active public spaces in and/or surrounding the market, are represented in the following:

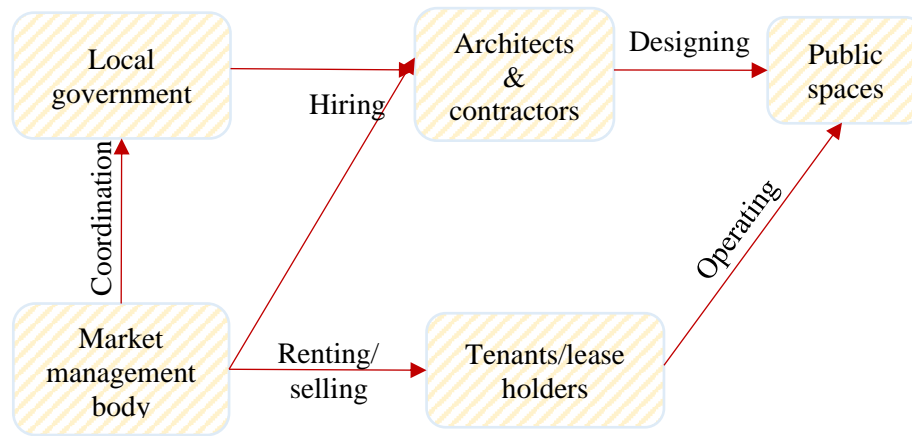


Figure 84- Actants and Their Relationships for Creating Active Public Spaces in/Surrounding the Market (Author's Illustration).

1. The local government's role is absent; thus no one coordinates with the market management body (which is also absent) for:
 1. Hiring architects and contractors to design public spaces in and around the market.
 2. Renting or selling the public spaces for tenants and leaseholders for them to operate the public spaces, (or having the local government or the market management body in charge of operating the public spaces by themselves).

4.6.4. Engine for community life

Tapping on the third function: engine for community life, an analysis is conducted on its first and second components: free non-controlled experience and bringing diverse people together, in the following table (25) and below figure (85).

Table 25- Analyzing Souq Al-Tunsi Using the Schema. Free non-controlled experience and bringing diverse people together.

Main Function	Components and factors			Whole Points	Graded points
3. Engine for community life	3.1. Free non-controlled experience	3.1.A. The market is free of institutional control (1 point).		1	1

	<p>were market leaders who worked to manage the market’s internal affairs and solve the arising problems. Passing by the mega-fire, and the revolution, the merchants exhibited a strong sense of ownership and belonging to the market, where they insisted on staying in the market to fix it, and when the government banned their existence, they returned back to the market after the revolution in the absence of the police forces. Nowadays, after the mega-fire and the revolution, the merchants managed to keep the ties connecting them (1 point), the proximity (1 point), and the sense of belonging and ownership (1 point), (except that the concept of having market leaders has declined).</p>			
	<p><u>3.3.B.</u> There are no effective social coalitions (0 points).</p>		2	0

The current actants and their relationships, for the high level of socialization, are represented in the following:

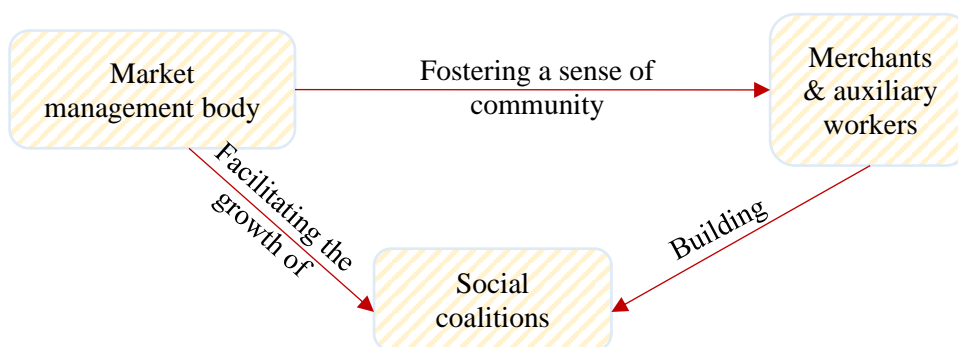


Figure 86- Actants and Their Relationships for High Level of Socialization (Author's Illustration).

1. The market management body is absent; therefore, nobody works on:

- Fostering the sense of community between the *merchants, auxiliary workers, and the customers*. Although the sense of community does exist at Souq Al-Tunsi, as stated in table (26), that does not deny the role of the *market management body* as the patron of the market who should ensure and foster a healthy social environment where all can feel a sense of the market community.
- Facilitating the growth of *social coalitions*, not mentioning the major role of *merchants and auxiliary workers* who should work to build them in the first place.

4.6.5. Fostering economic development

Tapping on the fourth function: fostering economic development, an analysis is conducted for its two main components: creating local employment opportunities and providing room for small and medium businesses, in the following table (27) and below figure (87).

Table 27- Analyzing Souq Al-Tunsi Using the Schema. Fostering economic development.

Main Function	Components and factors	Whole Points	Graded points
4. Fostering economic development	4.1. The market provides local employment opportunities for lots of merchants and auxiliary workers. On an area of 7.1 feddan, lots of merchants coming from Cairo and other governorates find a place in the market to sell their goods. Moreover, per the need-driven out of the type of commodities sold in the market, the market creates room for car drivers to transport the goods with their cars to the customers' destinations, baggers to carry the goods from the shops to the cars and from the cars to the customers' home, and technicians like carpenters, and blacksmiths (who have their tools ready with them) for setting up the goods in the customers' houses. These auxiliary workers, similar to the merchants, come from Cairo and other governorates. Hence, the market provides room for a whole system of merchants and auxiliary workers that all work together in coordination (1 point).	1	1
	4.2. The market provides limited room for small and medium businesses (1 point).	2	1

The current actants and their relationships, for fostering economic development, are represented in the following:

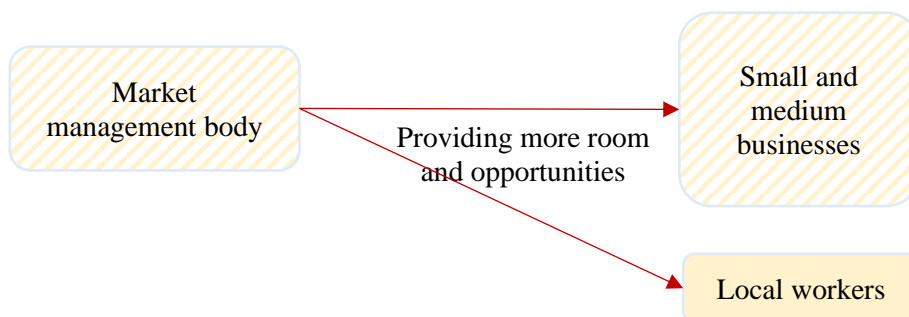


Figure 87- Actants and Their Relationships for Fostering Economic Development (Author's Illustration).

1. *The market management body* is absent, therefore, no one provides more room and opportunities for *small and medium businesses*.
2. *Local workers* have a room in the market due to the need for baggers, technicians, cooks, and car drivers so that the system of selling can succeed, but in formal markets, it is the role of the *market management body* to allow by their authority local workers to work in the market.

4.6.6. Quality urban life

The last function that is being examined in Souq Al-Tunsi is creating a quality urban life for the market and its surrounding urban spaces. The first component in this function is 5.1. Increasing safety, this component is studied along with its subcomponents in the below table (28) and figure (88).

Table 28- Analyzing Souq Al-Tunsi Using the Schema. Increasing safety in the market.

Main Function	Components and factors		Whole Points	Graded points
5. Quality urban life	5.1. Increasing safety	5.1.A. There are no formal governmental security systems in the market (0 points), however, there is an informal communal system of security, where there is a chief person in the market who hires people for protecting the markets from theft and harassment. In return, the merchants have to pay her for this service. This security system as the merchants clarify is not that effective for protecting their goods, but it is better than nothing, as there are lots of robbers and criminals in the area of the cemeteries (1 point).	2	1
		5.1.B. The presence of a safe setting for all types of users including women,	5.1.B.1. The setting is not well-maintained inside the market and does not apply the	3

			made of untreated wooden columns/bricks and covered with corrugated sheets and straw roofs. Besides, all of the shops do not have a concrete foundation (0 points).		
			<u>5.1.C.4.</u> there are no retaining walls at slopes around the market such as Al-Muqattam plateau overlooking the market from its eastern side (0 points).	1	0

The current actants and their relationships, for increasing safety inside the market, are represented in the following:

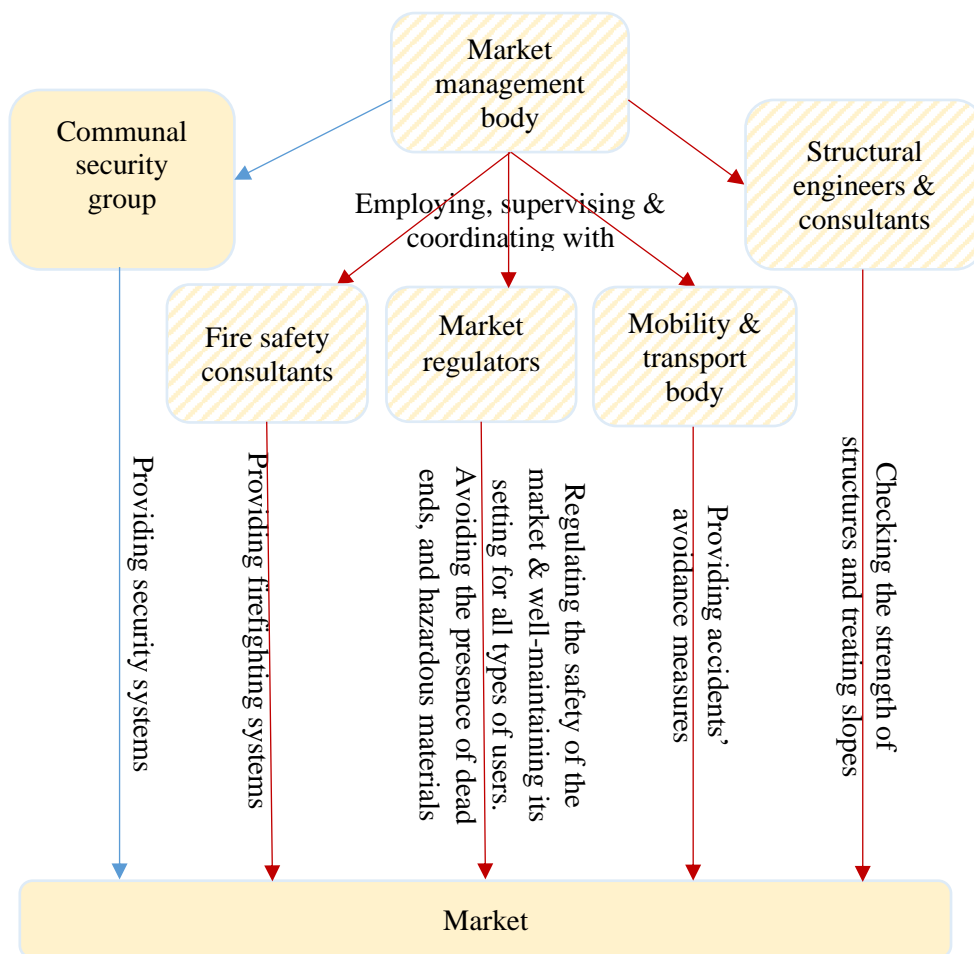


Figure 88- Actants and Their Relationships for Increasing Safety Inside the Market (Author's Illustration).

1. *The market management body* is absent; therefore no one works on:
 - Hiring *fire safety consultants* for providing firefighting systems inside the *market*.
 - Coordinating with the *mobility and transport body* for providing accidents' prevention measures for the *market*.
 - Hiring *structural engineers and consultants* for checking the soundness of structures and the overall setting of the *market*.
 - Supervising the *market regulators* who regulate the safety of the market, and well maintain its setting for the different types of users including considering disabled measures and avoiding the presence of dead ends and hazardous materials. (The role of the market regulators in this part is achieved indirectly and partly by the merchants themselves, as the merchants feel a sense of ownership and responsibility to the market, so they want to keep it safe for themselves and for attracting more customers, however, they do not succeed much in doing so).
2. A *communal security group* is present for having a security system inside the *market*; however, its service is not that effective.

The second and the last component in the quality urban life function is 5.2. Inspiring people in their daily life. Its subdivisions are examined in the below table (29) and figure (89).

Table 29- Analyzing Souq Al-Tunsi Using the Schema. Inspiring people in their daily life.

Main Function	Components and factors			Whole Points	Graded points
5. Quality urban life	5.2. Inspiring people in their daily life	5.2.A. The merchants', workers', and customers' needs are not met (0 points). Their needs at the current state of the market include having the basic services of water, energy, and waste treatment as well as having security points for achieving safety. The merchants and the workers also look forward to formalizing the market and making it more developed and organized.		1	0
		5.2.B. There is not an enjoyable creative environment. The market is very monotonous, and there is no room for creativity since the merchants are facing the risk of relocation from the government side to the 15 th of May city, so the merchants have fears that prevent them from further investing in the market to make it a more enjoyable place (0 points).		2	0

The current actants and their relationships, for inspiring people in their daily life inside the market, are represented in the following:

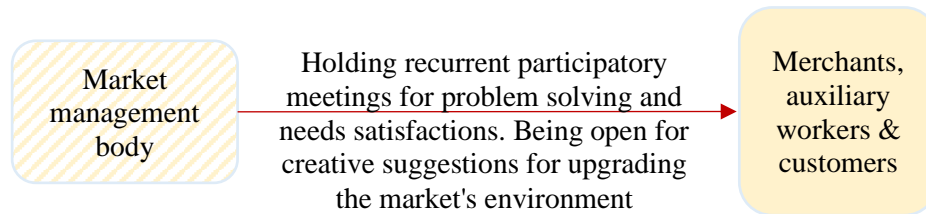


Figure 89- Actants and Their Relationships for Inspiring People in Their Daily Life Inside the Market (Author's illustration).

1. *The market management body* is absent; therefore, its role is not realized. This role entails holding recurrent participatory meetings for problem-solving and needs-satisfactions for the *merchants, auxiliary workers, and consumers*. Moreover, its role spans to provide an open medium for suggestions for upgrading the market's environment and making it more enjoyable. *The merchants and auxiliary workers* alone are not able to satisfy this function in the absence of the *management*, since they are threatened with relocation; that does not deny the fact that the *market management body* is the first responsible body for achieving this function.

After analyzing Souq Al-Tunsi using the analytical schema, the calculated total grade of the market is 36 points¹⁸⁴ out of 121 points, that reflects how much the market is missing lots of components and factors that affect its functionality, where it is functioning with only 29.75 %. This percentage is in compliance with the market's current state, where the market at the time of investigation was nearly empty of customers and lacked lots of components and proper functioning systems. This is due to its partial removal in preparation for its relocation and due to the pandemic of COVID-19. At this point in time, the market was not functioning as it used to, and that affected the profitability of the market and caused its decline.¹⁸⁵

4.6.7. Analysis using the mode of production model

Having used the analytical schema for analyzing Souq Al-Tunsi's dynamic functions, components, factors, actants, and relations, this section attempts to understand, using the mode of production model, how the human aspect has the greater influence over the whole market, and how this human aspect is classified in its own systems (non-SMTT systems) still affecting the other non-human systems (SMTT systems).

¹⁸⁴ These number are only indicators not a statistical component, as illustrated in section 3.3.

¹⁸⁵ For more info, refer to section 4.5.2.: limitations of research.

The mode of production of Souq Al-Tunsi is comprised of three main pillars: the elements of production, mainly the SMTT systems, the relations of production, and the forces of production, mainly the non-SMTT systems. Conducting observations and interviews, these three main pillars are studied below as well as illustrating how they affect each other dynamically and how that is interpreted practically on the market.

1. The elements of production prevalent in Souq Al-Tunsi are only distribution and exchange. Production and consumption are excluded from this model as they do not have a considerable impact on the market's functionality. That is because the production of the goods happens off-site (totally separated from the market), likewise, the consumption is carried out by the end-user off-market. Hence, the production and consumption are not directly related to the market. Having a look at the distribution systems related to the market, we find that the supply system of goods is divided into two systems:

- The new goods supply system. In this system, merchants (each one alone) fetch their new goods from factories and workshops located in the citadel, Darb Sa'ada, Ayyub, Giza, Munib, Damietta, Munufiyya, and other places using light-heavy duty trucks. Working to assess this system as a SMTT system: It is found that it is a high cost, timely, non-efficient, and non-sustainable system. Most of the factories and the workshops are located far away from the market especially the ones outside of Cairo. Each merchant alone goes on a trip to each workshop and factory with a light-heavy duty truck to transport what he will buy as shown below in figure (90). This is estimated to take an average of one day for each merchant for the round trip outside Cairo and 3 hours inside Cairo, not to mention the money spent which can reach around 500 EGP inside Cairo and 2000 EGP outside Cairo and the carbon emissions emitted out of a single one-way trip,¹⁸⁶ as illustrated below in table (30), (which has an average of: 3.975 CO₂ Kg per one-way trip inside Cairo and 35.973 CO₂ Kg outside Cairo)¹⁸⁷. Since the merchants have no storage, that means that they repeat these trips on an average

¹⁸⁶ Note: "With the burning of gasoline and diesel accounting for 59 percent and 24 percent of the transportation sector's emissions, respectively, significant reductions in auto and truck emissions are essential to climate change mitigation efforts". For more info see: Haven, P., & Gutin, O. (2015). Fact sheet: Vehicle efficiency and emissions standards. *Environmental and Energy Study Institute EESI*. Retrieved on 8 April 2021 from: <https://www.eesi.org/papers/view/fact-sheet-vehicle-efficiency-and-emissions-standards>

¹⁸⁷ Note: This is calculated based on the fact that a light-heavy duty diesel vehicle produces 318 CO₂ gm /tons mile equivalent to 198.75 CO₂ gm/tons Km and the average single trip inside Cairo constitutes around 20 Km whereas the average single trip outside Cairo constitutes around 181 Km.

of every 15 days when they are out of goods (approximately 24 times per year). For a whole year, this supply system would cost around 2,400,000 EGP for all the market and would produce an average of 76,701.6 CO₂ Kg for the whole merchants¹⁸⁸.

Table 30- Trips Inside and Outside Cairo.

Type of trip	Mean	Time	Destination	Money	Emitted CO ₂ ¹⁸⁹
Round trip	Light-heavy duty trucks	3 hours	Inside Cairo	500 EGP	3.97*2= 7.95 CO ₂ Kg
Round trip	Light-heavy duty trucks	1 day	Outside Cairo	2000 EGP	35.973*2= 71.946 CO ₂ Kg

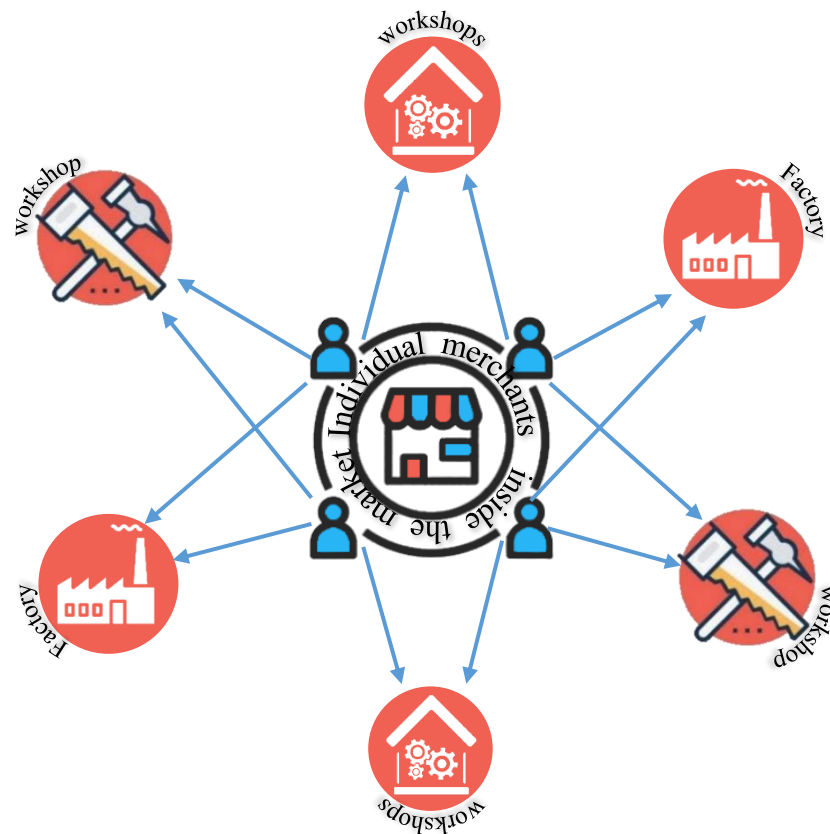


Figure 90- The New Goods' Supply Systems (Author's Illustration).

¹⁸⁸ Note: This is calculated based on general observations that the market has around 80 merchants (and the numbers could vary), and in the whole year each merchant does 24 trips to fetch his goods from factories and workshops, see Appendix A for full calculations.

¹⁸⁹ The emitted CO₂ for the supply system is calculated roughly to examine its impact on the environment and as a sustainability measure. Carbon emissions could only be calculated in this section for the supply systems alone due to research limitations.

- The used goods supply system. This system is based on having local collectors and distributors, the Rubabiqya persons who wander in residential areas on environment-friendly animal/bike pulled carriages looking for used goods which they can buy as shown in figure (91) and (92).



Figure 92- The Rubabiqya Person on an Animal Cart Looking for Used Goods in Residential Areas (Badrawi, 2018).



Figure 91- The Rubabiqya Person on a Tricycle Looking for Used Goods in Residential Areas (Azazi, 2018).

Rubabiqya persons then either come to Souq Al-Tunsi and sell it to the merchants or they sell it to warehouses and storages such as the ones located at Izbit Abu Hashish, Arba'a

Wi Nus in El-Wayli, Ghamra, Turab Al-Yahud, and Ma'adi. Merchants then go and buy from these storages as shown below in figure (93). Working to assess this system as a SMTT system, it is found that it is an efficient sustainable low-cost system.

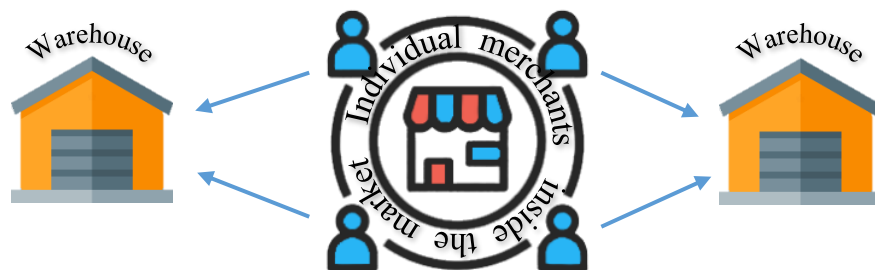


Figure 93- The Used Goods' Supply System (Author's Illustration).

First of all, the merchants spend fewer trips to fetch the used goods (approximately around 18 trips per year) than the new goods, that is because the Rubabiqya persons most often come and distribute the used goods to the merchants in the market. Second, the warehouses that the merchants go to are

located near to the market, the round trip takes an average of 2 hours for each merchant with spending around 350 L.E and producing an average of 2.583 CO₂ Kg per one-way trip¹⁹⁰. For a whole year, this supply system would cost around 504,000 EGP for all the market and would take around 36 hours for each merchant for achieving it as well as producing an average of 7,441.2 CO₂ Kg for the whole merchants.

On the other hand, the exchange system in the market involves all the acting systems that enable the exchange process on-site such as transport and mobility systems, energy- water-waste systems, communication systems, the urban fabric, and the built systems. As examined previously in the main schema, the transport and mobility systems related to the market are tied to the city's main public transport system (both formal and informal) as shown previously in the map (11). The city transport system that reaches the market includes minibuses, buses, and the metro system; private cars also reach the market, but as observed they are used very less compared to public transportation. The public transport system in Cairo (both formal and informal) passes across the different districts in Cairo tying the different communities. When closely examining the area of the market, it is found that there are six public transportation terminals as well as four metro stations surrounding and leading to the market as shown in the previous map (11). Moreover, the public transportation has an affordable tariff that the passengers can pay. With all these merits, the public transportation system has a great deficiency as it emits huge amounts of CO₂ gas. As shown in Egypt's first biennial update report released in 2018, the second main contributor to GHG emissions is CO₂ from road transportation (both governmental public transport and informal transit systems), since the transport sector produces around 15.0% of the whole fossil CO₂ emissions in Egypt. Hence, the transport and mobility systems need to be more sustainable, and eco-friendly.¹⁹¹

Looking at the energy, water, waste, and communications systems inside the market, it is found that these systems are missing as illustrated in the analytical schema,

¹⁹⁰ Note: This is calculated based on the fact that a light-heavy duty diesel vehicle produces 198.75 CO₂ gm/tons Km and the average single trip inside Cairo constitutes around 13 Km.

¹⁹¹ Ministry of Environment EEAA. (2018). Egypt's first biennial update report to the United Nations framework convention on climate change. *Ministry of Environment, Egyptian Environmental Affairs Agency*. Retrieved on 12 April 2021 from: <http://www.eeaa.gov.eg/portals/0/eeaaReports/N-CC/BUR%20Egypt%20EN.pdf>; Mohamed, (2011), "Under bridge" as an urban public space; *Worldometer*. (2021). Egypt CO₂ emissions. *Worldometer*. Retrieved on 11 April 2021 from: <https://www.worldometers.info/co2-emissions/egypt-co2-emissions/>

so they cannot be assessed as a SMTT type of systems in terms of time, efficiency, and sustainability.

Examining the urban fabric systems, it is found that it only includes internal streets penetrating the market, some trees, and climbing plants. These elements do not have an initial cost nor a running cost since they evolved naturally in the area of the market and are not being maintained. The internal streets are used both as driveways and walkways; they are made naturally with the placement of the shops along with the bridge and with the government paving some of them incidentally in the urban re-planning after the mega-fire. On the other hand, the trees and climbing plants grow along the area of the cemeteries with no botanical care. Nonetheless, they help to make the area more sustainable since they create indirect evaporative cooling for the surrounding environment and mitigate the heat island effect. However, these green elements are not that efficient since they are not sufficient, i.e., more green elements need to be planted and grown in the area to achieve the optimum efficiency. The internal streets, on the other hand, show no signs of sustainability or durability, most of the internal streets are not paved, and they accumulate piles of mud and dirt, leading to a non-healthy unclean environment as shown previously in figure (78) in section 4.6.3.

Moving on to assess the built systems of the market, it is found that the market is made of simple materials (such as wood, bricks, straw, and corrugated sheets) organized to provide shelter from the sun and define the area into an array of shops as formerly shown in figures (52) and (53) in section 4.6.2. These materials succeed in providing a good shelter while defining the boundaries of each shop and the whole market, thus they work efficiently in achieving their purpose. Moreover, these materials compared to building with reinforced concrete have a low cost, but they do not offer strength and durability for the market, (more than 60% of the market has been burnt very quickly since it was all made of wood and straw before 2010), thus, they are not sustainable. Looking at the built form, in terms of assessment, it is found that the market is comprised of a horizontally spread urban form that is made of ground-floor shops and a few mezzanine floors. This type of form does not accommodate for compactness, where the market sprawls on an area of 7.1 feddan, thus it creates a high land consumption with little production, little density, and energy inefficiency. However, there is a partial need for dispersing the built-up form, since the market offers certain

types of products that require a spread-out form, so the form should be compromised to accommodate for dispersion and compactness ¹⁹².

2. The second pillar of the mode of production of Souq Al-Tunsi is the relations of production. The relations of production stem from the technical relations of production and the social relations of production, some of them are mediated with the commercial relations of production. The technical relations of production are those constructed between humans and objects in the physical dimension, those objects are called means of labor or means of production. In the case of our market, Souq Al-Tunsi, the technical relations are made between the market stakeholders—mainly merchants, workers, and customers—and the physical objects in the market such as the bridge, the built shops, the goods, the electric wiring, the present softscape, and hardscape elements...etc. Closely examining the type of relationship between the human individuals and the mentioned physical objects determines how the elements of production (physical SMTT systems and objects) impact the technical relations of production and vice versa. This also determines how these relationships should be adjusted for a better mode of production for the market. A skimming of these technical relationships is shown as follows:

- The merchants use the bridge as a cover for their shops as shown below in figure (94), and the bridge defines the boundaries of the market space, where the market spans along with it. This type of relationship uncovers a brilliant use of space and at the same time augments the frequency of risks that the market is exposed to since any accident on the bridge can affect the market like the mega-fire in 2010.



Figure 94- Souq Al-Tunsi Bridge as a Cover for the Market Under it (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

¹⁹² Lehmann, S. (2010). *The principles of green urbanism: Transforming the city for sustainability*. Earthscan, 153.

- The merchants use wooden beams, corrugated sheets, and straw, to construct their shops since they are low-cost materials, as well as bricks in some of the shops as previously illustrated in section 4.6.2.). In return, these elements enable the merchants to easily modify the space, divide it, or enlarge it, since they can be easily mantled and dismantled. These elements also allow the merchants to display their goods on it, as shown below in figure (95), (96), and plant on its crossings, as shown in figure (97). This type of relationship highlights the fluid use of this kind of construction material.



Figure 95- The Display of Goods Internally on the Constructed Wooden Beams (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 96- The Display of Goods Externally on the Constructed Wooden Beams (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 97- The Growing of Climber Plants on the Crossings of the Wooden Beams (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

- The merchants use the goods for both exchange, and complementing what is missing in the market, for example, since there is no seating in the market, the merchants use the displayed furniture to sit on them as shown in figure (98). This type of relationship shows the unprofessionalism and the casualness of the merchants.



Figure 98- Using the Displayed Furniture as a Seating (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

- The merchants use the internal open spaces between the shops as driveways, walkways, loading decks, an extension for their display area, and a place for throwing away their wastewater as shown below in figure (99) and (100). This

space in return demotivates the customers to walk in it since it echoes the disorder and the uncleanliness of the market.



Figure 99- Using the Internal Open Spaces Between the Shops as Driveways, Walkways, and an Extension for Their Display Area (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 100- Using the Internal Open Spaces Between the Shops for Throwing Away the Wastewater (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

- The railroad lines provide a straight clear path passing between the market, the merchants use these railroad lines as a secondary way to move in the market as well as putting their scrap on its sides as shown below in figure (101) and (102). This type of relationship enhances the connectivity between the market edges and at the same time, puts the market at great risk of accidents and fire.



Figure 101- The Railroad Lines Passing Through the Market (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.



Figure 102- The Placement of Scrap on the Side of the Railroad Line (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

- The merchants pull electricity wires from the nearby residential neighborhoods and the bridge to light their shops as shown in figure (103). This type of relationship prevails the informality of the market and the unwillingness of the government to supply the market with the basic services of energy and lighting.



Figure 103- The Hanging of the Pulled Electricity Wires Under the Bridge (Author's Footage, 2020). Click [Here](#) for reaching its location on the keymap.

On the other hand, the social relations of production are the relations that people have to construct to produce, reproduce and survive, where participation in these social relationships is not voluntary. In the case of our market, Souq Al-Tunsi, the social relations are made between the merchants and themselves, the workers, the customers, and the involved stakeholders in order to operate the market. Closely examining these social relationships determine how the different social elements impact each other, and how these relationships should be adjusted for a better mode of production for the market. A skimming of these social relationships is shown as follows:

- The merchants and auxiliary workers, although coming from different communities, are socially proximate (by the effect of time and interaction) and they know and support each other. This relationship prevails the healthy social life of the merchants inside the market.
- The customers come from different communities, and they do not know each other, thus, they do not interact at all with each other, still, few of them have good ties with the merchants. That shows that the market does not foster social connectivity between the customers, each other, and the merchants.
- The independent food providers work to prepare food and drinks for the merchants and the workers in the market (they satisfy an essential need for them), and they are socially proximate to the merchants and the auxiliary workers.

- The social relationship between the merchants and the informal communal security chief and individuals is a compulsory relationship, where the merchants are obliged to pay for them in return for their protection. The merchants and auxiliary workers are not satisfied with this system, and they see it as ineffective, however, they pay by force to avoid tussling with them.

The third type of relation in the relations of production is the commercial relationship. With the rise of commercialization, some relations of production (both technical and social) became obscured. Nowadays, the market has become a place where people will purchase goods and commodities without knowing who made them and where. They know that there is a social dependency on the producers objectively since they rely on their production to satisfy their needs, however, they do not know who the producers are specifically. This has led to proliferating the relationships between tradeable things inside the market. Not only that, but these commercial relations have also started to regulate and control the human pattern of contact and technique, in other words, the commercial relations inside Souq Al-Tunsi have a huge role in affecting the SMTT systems and particularly the urban setting. This can be seen evident in the commercial relationship between the producers (factories and workshops), the distributors (the Rubabiqya persons in case of used goods), and the merchants. This relationship is a non-voluntary one governed by the rule of supply and demand, where the merchants need to buy the new goods from the producers and the used goods from the Rubabiqya persons who collect and distribute the used goods to market. Moreover, this commercial relationship is reflected on the production site (which was not highlighted in this dissertation due to its distance from the market), the transportation acts going back and forth carrying the new and used goods, the distribution activity to the merchants, and the crowd selling activity that constitutes the market. All these processes and activities resulting from the commercial relationship help create the market urban setting affecting its current SMTT systems. Reciprocally, that created urban setting along with the generated SMTT systems fosters certain types of commercial relationships that differ from the ones found at other types of formal markets and department stores.¹⁹³

¹⁹³ McMurtry, (2015), Structure of Marx's world-view, pp.76-80.; Morrow, (1986), In the tracks of historical materialism; Rockenbach, (2007), Moral sentiments and material interests; Therborn, (1976), Science, class, and society, pp. 88-119.

3. The third pillar of the mode of production of Souq Al-Tunsi is the forces of production that contain the drivers that call for this certain type of production. These forces contain the social systems, political systems, culture, and identity (non-SMTT type of systems) of the market and the surrounding urban area. The whole area of Souq Al-Tunsi lies in the deteriorated historical core of Cairo that entails intricate social cultural political dimensions that are intertwined together in the fabric of the place. The settlements around the market (including Al-Imam Al-Shaf'i and Al-Khalifa settlements as shown in previous map 5 in section 4.5.1. ditto the vast historical cemetery areas such as Sidi Umar Ibn Al-Farid, Al-Imam Al-Shaf'i, and Al-Imam Al-Tunsi cemeteries which have an average of 100,000 inhabitants) have a high percentage of old, crowded, and deteriorated structures within the medieval urban fabric.¹⁹⁴ These settlements are inhabited by many poor families who are:

- Cemeteries dwellers who work in the cemeteries and reside in them with their families, and those who cannot find affordable housing and inhabiting the cemeteries were their only option.
- Peasants who immigrated from upper and lower Egypt governorates and became city workers, (some of the merchants come from Al-Minya, Bani Suwif, Al-Qalyubiyya, and Al-Fayoum, and reside around and inside the market).
- Outlaws who flee to remote areas such as the cemeteries to be outside the control of the security forces.¹⁹⁵

According to the primary research conducted, these inhabitants are classified to have a low social income with little or no education (most of the merchants/users in the market are not educated or have left the educational system since they found the selling process in the market more profitable than working by getting educational degrees). The culture carried within these inhabitants is an informal culture based on informality and disenfranchisement, where the residents receive limited/poor quality ecosystem services and utilities (including freshwater, sewage, and electricity), social services (like health and education), and recreation facilities (such as green parks and entertaining public spaces). That is because, politically, the area is ignored by the local government because

¹⁹⁴ Nassar & Elsayed, (2018), From informal settlements to sustainable communities; Sims D., Sejoume, M., & El Shorbagi, M. (2003). Understanding slums: Case studies for the global report, the case of Cairo, Egypt. *UCL DPU projects*. Retrieved on 19 April 2021 form: https://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Cairo.pdf

¹⁹⁵ Mohamed, (2011), "Under bridge" as an urban public space.

developing such informal areas (even when they are on a historical urban core) lies outside the main political agenda, instead the government plans to eradicate the whole area, and relocate the market.¹⁹⁶ Thus, the whole area surrounding the market lies outside the city's urban planning and lacks governmental representation and state territorial control. These cultural and political forces are reflected in the residents' social status and behavior, where they exhibit a high rate of ignorance, poor public health, and a high prevalence of theft. These social, political, and cultural forces are also reflected in the market and its surrounding communities, where they impact and control the elements of production (SMTT systems) and the relations of production as illustrated below:

- The lack of territorial control allowed the merchants to use the empty space under the bridge (including the railroad lines) and around it for setting the market. This in return has resulted in creating an informal market that lacks proper urban design. This has led to exposing the market and the merchants to great risks like the mega-fire in 2010 since the market was not properly designed to mitigate the surrounding environmental risks.
- The informality of the market and its political situation outside the city's urban planning deprives the market and the surrounding informal area of governmental services such as sustainable energy, water, waste, and communications systems, and proper space design of shops and internal streets. As previously illustrated, the lack of design and provision of ecosystem services exposes the merchants to do unconventional practices like using the internal streets as driveways, pathways, loading decks, an extension for their display area, and a place for throwing away their wastewater. This lack also pushes the merchants to pull the electricity wires informally from the surrounding neighborhoods to lighten the market.
- The informality of the market also leads to social proximity and cohesion between the merchants and the workers since they rely on each other, as there is no other social or governmental support.
- The lack of education and management (due to informality) inside the market leads to a high cost, timely, non-efficient, and non-sustainable distribution system where the merchants pay around 37 trips each one alone to fetch their new goods, causing the emission of 147,810.375 CO₂ Kg and cost of 4,625,000 EGP for all the market per year. The lack of management also contributes to the lack of operational rules

¹⁹⁶ See Appendix B for more details about the government agenda and the relocation of the market.

and regulations that has to do with rental and stall-allocation, fees, and taxes collection, keeping public order, security, traffic, and hygiene control. Moreover, the absence of a good management contributes to the lack of recurrent cleaning, maintenance, attractive engaging elements, entertainment features, sustainable urban fabric, and quality urban life.

- The social fear of relocation prevents the merchants from upgrading the market and building it with more durable materials (such as reinforced concrete) and promoting the various hardscape and softscape elements in the market.
- The ignorance and unprofessionalism of the merchants make them use the goods before selling them.

All in all, the human aspect represented in the forces of production (the social, cultural, and political systems mentioned above) has the greater influence over the Market, where it shapes it, and controls its elements of production (SMTT systems) and its relations of production.

Having illustrated the mode of production of Souq Al-Tunsi, the market analysis has ended, and proposing guidelines for developing the market in integration with its zone of influence revitalization is demonstrated in the below section.

4.7. Proposing Guidelines for Developing Souq Al-Tunsi in Integration With Revitalizing its Surrounding Neighborhoods and Communities

After analyzing Souq Al-Tunsi using the analytical schema and the mode of production model, the researcher proposes guidelines (as formerly explained) based on the following:

Step 1: Integrating the missing functions, qualitative components, factors, actants, and relationships back in the market.

Step 2: Determining the kind of actants and relations that best suit the context of the market and the surrounding communities, maintaining a mix of the different kinds of actants and objects (Fluid, Network, Euclidean) as needed to achieve both stability and sustainability.

Step 3: Treating the malfunctioning systems that appear in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems.

The researcher in this chapter proposes guidelines based on steps 1 and 3, step 2 requires an expert multidisciplinary team. The guidelines relying on the first step mentioned above are summarized below in table (31).

Table 31- Proposing Guidelines Based on the Analytical Schema.

Main Function	Components and factors			Proposed Guidelines	
1. Exchange	1.1. Offering a wide range of commodities and services for different classes at competitive prices.	<p><u>1.1.A.</u> The presence of semi-sustainable and resilient selling objects such as shops and stalls.</p>	<p><u>1.1.A.1.</u> Display spaces exist (1 point), but they are not well organized (1/2 point). These spaces are not attractive for the consumers (0 points). Moreover, they are made of bricks/untreated wood, and covered with corrugated sheets/straw, as shown in figures (52) and (53). Bricks and corrugated sheets are durable and stable, but they are very rigid materials that do not cater much for resilience. On the contrary, untreated Wood, and straw are less durable and fire hazardous, yet they are very fluid, as they can be easily mantled, reorganized, and dismantled. Untreated wood and straw also have low carbon footprints unlike bricks and corrugated sheets, so they are midway in the sustainability track (1/2 point).</p> <p><u>1.1.A.2.</u> There are no storage spaces (0 points).</p> <p><u>1.1.A.3.</u> Proper exchange spaces are not present (0 points).</p>		<p>The selling objects should be designed to be more sustainable and resilient, where display spaces should be attractive, organized, and sustainable (in terms of endurance). Storage spaces should be lodged within the market or nearby to allow the merchants to store their goods. These types of spaces should be secured, climate-controlled and pest free. Selling objects in the market should be made of sustainable durable resilient materials and design to accommodate for a fluid high spatial resilient space with low carbon emissions. Market regulators (whether governmental or self-communal) should be present to regulate and supervise the selling objects with their inclusive spaces: display, storage, and exchange, as well as supervising the work of the merchants and the auxiliary objects.</p>
		<p><u>1.1.B.</u> Goods distribution and supply systems.</p>	<p><u>1.1.B.1.</u> Merchants (each one alone) fetch their new goods from factories and workshops located in the citadel, Darb Sa'ada, Ayyub, Giza, Munib, Damietta, Munufiyya, and other places. Used goods are being collected by Rubabiqya persons who wander in residential areas looking for used goods that they can buy. Rubabiqya persons then either come to Souq Al-Tunsi and sell it to the merchants or they sell it to warehouses and storages such as the ones located at Izbit Abu Hashish, Arba'a Wi Nus in Al-Wayli, Ghamra, Turab Al-Yahud, and Ma'adi. Merchants then go and buy from these storages. The only supply chain system in Souq Al-Tunsi is represented in distributing the used goods by the Rubabiqya persons to the merchants (1/2 point). This supply system is short and efficient, but since it is done to the used goods only, therefore, it takes a partial grade. (1 point).</p> <p><u>1.1.B.2.</u> Handling of goods inside the market to reach the shops is done in the main street overlooking the market without the presence of private service lanes. (1 point).</p>		<p>The delivery of new goods to the marketplace in a quick sustainable regular manner should be achieved through short efficient supply chains of commodities that demand the presence of distributors. Instead of the merchants going each one alone to factories and workshops to fetch their goods, distributors should be collecting the new goods from factories and workshops and delivering them to the market or warehouses in order to facilitate the supply chain process. The safe delivery of goods to the marketplace also requires proper handling of goods inside the market to reach the selling objects. That demands the design of market service lanes to accommodate for the unloading and transportation process inside the market, to avoid the possible damage that can occur to the goods, the accidents, and potential risks that the customers can get exposed to, and the creation of traffic inside the market. The safe delivery of goods also requires the presence of market regulators to supervise the processes occurring at the market service lanes and to control what enters the shops and when.</p>
		<p><u>1.1.C.</u> The presence of merchants and auxiliary workers.</p>	<p><u>1.1.C.1.</u> Merchants and auxiliary workers show frequent presence in the market's working hours, which is every day (including weekends) from 8 am to 9 pm (2 points).</p>		<p>Market regulators should be present to supervise and monitor the presence of the merchants and workers in the working hours of the market, to ensure that the market will be always operated and</p>

		<p><u>1.1.C.2.</u> Nowadays at times of COVID- 19, Merchants and auxiliary workers gain slightly profitable income from the market, unlike the great profits they used to gain in normal working conditions due to the presence of a limited number of customers (0 points).</p> <p><u>1.1.C.3.</u> A diverse segment of customers (including men, women, and elderly from all over Cairo and upper Egypt) visits the market on a regular basis in normal working conditions and buy goods, that is because the market is a national one that grabs different socioeconomic segments from all over Egypt (1 point).</p>		<p>lively during its working hours. Besides, merchants and workers should be thinking about innovative profitable ways at the time of COVID-19 and other crises like displaying their items online to revive the selling process and gain profitable income. Merchants can also apply COVID-19 protective measures and showcase this to the customers through social media.</p>
1.2. Positioning and Reachability	<p><u>1.2.A.</u> Positioned near to many communities</p>	<p><u>1.2.A.1.</u> This market is national, customers come from everywhere all over Cairo and Upper Egypt. That is because the market is tied to the surrounding districts' main axes Salah Salim and the Ring Road, as formerly shown in map (5), this tie links the market easily to various communities in and outside Cairo, so the market can be considered close to the customers' communities since it is easily reachable (1 point).</p> <p><u>1.2.A.2.</u> The market is close to the merchants' and other workers' residences, where the majority lives in Al-Imam Al-Shaf'i, Izbit Abu Dil, Turab Al-Yahud, Izbit Abu Hashish, Arba'a Wi Nus in Nasr city, Al-Wayli, and Al-Ma'sara. Some merchants and workers come from Al-Minya, Bani Suwaif, Al-Qalyubiyya, and Al-Fayoum outside of Cairo and reside next to the Souq, or inside the Souq in small rooms inside the shops (2 points).</p>		<p>The role of the UDF, Ministry of Housing, Utilities and Urban Development (with the mobility planners and traffic officers included) and the local government should be revisited to include the development of this public market (as part of the larger scope to upgrade public markets in general) to make it more reachable by establishing road links connecting it to the surrounding commercial and social facilities. This in return will increase the number of customers thus increasing the popularity and profitability of the market.</p>
	<p><u>1.2.B.</u> The market is linked to the districts' main axis (Salah Salim and the Ring Road), and is easily reachable through them, as shown in map (5) (1 point).</p>			
	<p><u>1.2.C.</u> The market is close to public transport facilities as shown in map (11) (1 point).</p>			
	<p><u>1.2.D.</u> The market is not close to any commercial and social facilities (0 points).</p>			
1.3. Accessibility	<p><u>1.3.A.</u> Currently, there are two access points for users at Souq Al-Tunsi, one after the onset of the bridge under it, and one at its end as shown in figure (59) (1 point). These access points are not clearly defined (0 points).</p>			<p>Market regulators should be present to regulate and control the opening and closure of the existing access points. They should also work along with the local Government, the UDF, and the ministry of Housing, Utilities, and Urban Development to clearly define these user access points. Furthermore, they should work on designing and incorporating access points for goods, service lanes, and unloading decks for achieving easy accessibility of commodities to the market.</p>
	<p><u>1.3.B.</u> There is no easy access for deliveries to the market since there are no access points for goods, service lanes, and unloading decks. (0 points).</p>			
1.4. Smooth internal circulation and Mobility	<p><u>1.4.A.</u> There is a network of passages and local streets connecting to all stalls and shops (2 points).</p>			

	<p><u>1.5. Average built-up Density</u></p>	<p><u>1.5.A.</u> The built-up form of the market is made of ground floor shops and a few mezzanine floors, where it spreads horizontally in the area. The form is dispersed rather than being concentrated and it contains a single-use, therefore the form is not compact as shown in figure (62) (0 points). Due to the dispersion of the market on 7.1 feddan and the new planning of the area after the fire to accommodate for wide spaces for roads and used lands, the market is uncrowded (1 point).</p>			<p>The market management body should be present to collaborate with the local municipality, UDF and the ministry of Housing, Utilities, and Urban Development to redesign the built-up form of the market to make it more compact while avoiding making it too crowded. This is to be done in a participatory design process that includes the input of the merchants, customers, and the auxiliary workers so that the new design is well addressed to align with the main stakeholders' needs.</p>
	<p><u>1.6. Management</u></p>	<p><u>1.6.A.</u> Permanent stable operations.</p>	<p><u>1.6.A.1.</u> Operations of market rules and regulations.</p>	<p><u>1.6.A.1.1.</u> The market has stable working hours, yet without market regulators, since there is a weakened communal leadership in the market, especially after the mega-fire) (2 points).</p> <p><u>1.6.A.1.2</u> There are no rental and stall-allocation policies and thus no application (0 points).</p> <p><u>1.6.A.1.3</u> There are no fees or taxes collected except for a small amount of money that is paid monthly for the electricity company as a reconciliation of the electricity used informally. Other sums of money are also paid informally to policemen (1 point).</p> <p><u>1.6.A.1.4.</u> There is no security and traffic control (0 points).</p> <p><u>1.6.A.1.5.</u> There is no enforcement of environmental, public health, and food safety requirements (0 points).</p> <p><u>1.6.A.1.6.</u> There is no hygiene control and product inspection (0 points).</p>	<p>Good management is needed (whether communal or governmental) for the proper functioning of the market. That implies having a market management body whose role is to manage and supervise the market regulators and operators who also should be present to do the following:</p> <ul style="list-style-type: none"> • Ensure food safety, hygiene control, and product inspection for goods. • Apply rental and stall allocation policies for shops and stalls (rental and stall allocation policies should be set after formalizing the market following the regulatory norms provided by the local Government). • Ensure stable working hours, order, security, traffic control, and enforcement of environmental requirements inside the whole market. • Collect fees and taxes (as determined by the government) from merchants and auxiliary workers and keep public health. • Do administration work and record keeping.

				1.6.A.1.7. There is not any entity—neither governmental, since it is an informal market, nor communal due to the presence of a weakened communal leadership—that keeps public order (0 points).	The market management body should be present to source and supervise the cleaning and maintenance body, whose role entails periodic cleaning and maintenance for the whole market. Maintenance can be done with/without coordinating with the local government, according to the level of authority that the market management body possesses.
			1.6.A.2. There is no Administration and record keeping (0 points).		
		1.6.B. Continuous maintenance	1.6.B.1. There is no recurrent cleaning for the whole market (0 points).		
			1.6.B.2. There is no continuous improvement of facilities and used objects (0 points). (Except that when the whole market was burnt the government re-planned it and the merchants rebuilt it with more durable materials).		
1.7. Attractiveness	1.7.A. The market is very plain, where there are no engaging seductive elements and sensory temptations (0 points).			The market should be attractive to pull a huge number of customers, who will go there out of a desire of spending time at the market not just out of a need to buy something. Thus, the exchange process will not only be a necessity, but rather a social leisure activity. This attractiveness can be fulfilled by the presence of the market management body who should arrange with the local municipality to hire architects and contractors. This is for the aim of reviving the market by designing engaging seductive elements and entertaining features and redesigning the facades of the surrounding buildings. (This should be done after an in-depth study of this market in relation to the context, to determine how the market can act as a social hub for the surrounding neighborhoods and communities).	
	1.7.B. The absence of interesting facades (0 points).				
	1.7.C. There are no entertainment features (0 points).				
2. Urban growth and regeneration	2.1. Preserving culture and historic heritage	2.1.A. There are few renovations for the surrounding historic monuments and ancient buildings like the restoration of Al-Imam Al-Shaf'i which is 824 meters away from the market. However, there are other closer monuments that are left in a deteriorated state, like Bawabit Guha which is directly overlooking the market, as shown in the map (12), (1 point).		Preserving cultural and historic heritage depends on renovating historic monuments and ancient buildings that are situated surrounding the market like Bawabit Guha. Achieving this demands the presence of the Ministry of Antiquities and the NOUH to coordinate with architects/NGOs/ international organizations, who are concerned with preservation, for renovating and restoring the historical monuments and ancient buildings.	
	2.2. Integrating communities	2.2.A. Linking the rural to the urban	2.2.A.1. Some goods from rural areas outside of Cairo (like Damietta, and Al-Munufiyya) are delivered to the market. (1 point). Furthermore, the market offers stalls for merchants outside of Cairo, where merchants from Al-Minya, Bani Suwif, Al-Qalyubiyya, and Al-Fayoum, and sell in the market and reside in it (1 point).	Although some goods from rural areas are delivered to the market and the market offers stalls for merchants outside Cairo, this integration between the rural and urban communities can be further expanded. This expansion requires the presence of a market management body that works on enhancing and strengthening the connections between the rural communities and the urban market for better shared economic development.	

2.3. Developing infrastructure	2.3.A. Water supply and treatment systems	2.3.A.1. There are no clean water systems supplied to the market. When the users of the market need water, they fetch it from the nearest mosque or street water dispensers (0 points).		The role of the Water company (Holding Company for Water and Wastewater, HCWW) should be reconsidered to provide the market with sustainable water supply systems and water treatment systems, such as recycled greywater systems, black water systems, and harvested rainwater systems. The company's role should also include coordination with the market management body for applying water reduction techniques, such as using sensors).
		2.3.A.2. Minimizing freshwater consumption	2.3.A.2.1. There is no supply of water to the market, thus the use of sensors/ other reductive techniques is not applicable (0 points).	
		2.3.A.3. Recycling used water	2.3.A.3.1. There is not a sewage system in the market, so the use of a greywater system is not applicable (0 points).	
			2.3.A.3.2. There is not a black water system for the market, so the treatment of the system is not applicable. The market's users use a trench system instead, where they dig trenches under their toilets (0 points).	
	2.3.B. Waste generation and treatment systems	2.3.A.3.3. There is not a harvested rainwater system (0 points).		The role of the waste management authority, The General Authority for Cleanness and Beautification, and the informal waste pickers should be reconsidered to collect waste from the market and recycle it. Their role should also include coordination with the market management body for reducing the waste generated inside the market.
		2.3.B.1. There is no solid waste collection, where waste and scrap are disposed on the sides of the market and besides the railroad line, as shown in figures (69) and (70), (0 points).		
		2.3.B.2. There is no waste reduction (0 points).		
	2.3.C. Energy generation and supply systems	2.3.B.3. There is no waste recycling (0 points).		The role of the Energy company, The Egyptian Electricity Holding Company should include supplying clean energy to the market through the installation of renewable energy systems inside the market (there might be a need to get electricity from the national grid as well). The company's role should also include coordination with the market management body for reducing fossil-fueled energy (like diesel generators) and using energy-efficient appliances. Besides, the market management body's role should extend to hiring architects and consultants (this might require coordination with the local municipality as well) for employing passive energy techniques inside the market for reducing cooling and heating loads.
		2.3.C.1. There is no supply of energy (not from renewable sources or even non-renewable sources) inside the market. The merchants, however, use the electricity informally by pulling wires from the nearby residential neighborhoods and the bridge to light their shops, as shown in figures (72) and (73), (0 points).		
		2.3.C.2. There is no minimizing of the use of fossil fuel energies (0 points).		
	2.3.C.3. Reducing energy uses	2.3.C.3.1. There is no reduction in heating and cooling loads using passive energy-saving techniques. As a matter of fact, there is no energy supply to the		

			market thus the heating and cooling loads are negligible, still, the market is in dire need of passive energy-saving techniques for the harsh weather in summer and winter) (0 points).		
			2.3.C.3.2. There is no usage of energy-efficient appliances (0 points), only energy-efficient lighting fixtures are used, as shown in figure (73), (1 point).		
	2.3.D. Transport and mobility systems	2.3.D.1. The market's urban space facilitates non-motorized forms of transport like walking; however, the walking lanes need to be well maintained and paved for a better experience (1/2 points).			Facilitating non-motorized forms of transport inside the market is realized to a good extent, where the market's urban space accommodates walking, but the walking lanes need to be paved and well maintained for a better experience. This can be achieved by extending the role of the market management body to coordinate with the local municipality to well maintain and pave the walking lanes inside and surrounding the market. The market management body's role also entails coordinating with the public transport body/informal mass transit to further facilitate public access to markets, such as putting transport stations at the beginning and the end of the market to ensure optimum public access facilitation.
		2.3.D.2. Public transport is integrated in a way that facilitates access to the market and reduces private cars as previously shown in the map (11) in section 4.6.2. (2 points).			
	2.3.E. Telecommunication systems	2.3.E.1. There are no telecommunication lines, but there is a poor-average mobile coverage (1/2 points).			The market management body should coordinate with the Telecommunications Company for supplying the market with telecommunication lines and better mobile coverage.
2.4. Urban fabric	2.4.A. Renovating hardscape using sustainable materials	2.4.A.1. There is not a special space for the walkways, as they are in the space of the driveways, and some of these spaces are not paved (0 points).			The market management body should work to hire architects and contractors for renovating the urban fabric (both the hardscape and the softscape elements) inside the market.
		2.4.A.2. Some of the driveways are not paved, as shown in figure (78), (1 point).			
		2.4.A.3. There are no benches/seating (0 points).			
		2.4.A.4. There are no special walls and fences for the market (0 points).			
		2.4.A.5. There are no edgings (0 points).			
		2.4.A.6. There are no pergolas/patios (0 points).			
		2.4.A.7. There are no water features in or surrounding the market (0 points).			
		2.4.A.8. There is no special lighting for the market (0 points).			

		<u>2.4.B.</u> There are some softscape elements in the market and surrounding it as shown in figures (79) and (80), but no one works on growing them and increasing the green areas in general (0 points).			
	<u>2.5.</u> Tourism attraction	<u>2.5.A.</u> Creating new poles of tourism attraction	<u>2.5.A.1.</u> There is no designing/reviving for new/existing iconic elements in/close to the market (0 points). <u>2.5.A.2.</u> There is no publicizing and advertising for tourism attraction (0 points).		The local government should coordinate with the NOUH to revive and link the surrounding landmarks and iconic buildings to the market and create more authentic experiences for the tourists. Besides, it should coordinate with The State Information Service to conduct advertisements for both: (the proposed to be revived) landmarks and iconic buildings, and the authentic experience of the market and its surrounding historical area. This is for the aim of making the market and whole surrounding area more popular and profitable, since landmarks and iconic buildings along with authentic experiences grab tourists, add an international exposure to the area of the market, and contribute to better wayfinding for the market and its surrounding neighborhoods.
	<u>2.6.</u> There is no revival and connectivity to the surrounding focal points and landmarks (such as Masjid Al-Imam Al-Shaf'i and Masjid Al-Sayyida 'Aisha) for better attraction and wayfinding to the market (0 points).				
	<u>2.7.</u> Creating active public spaces in/surrounding the market	<u>2.7.A.</u> There are no pavilions (or other similar spaces/structures) in and/ or surrounding the market (0 points). <u>2.7.B.</u> There are no gardens/ parks in and/ or surrounding the market (0 points). <u>2.7.C.</u> There are no restaurants/ cafes in and/ or surrounding the market, except that there are local coffee shops, Qahwa, near the market and independent food providers in the market whose service does not comply with the public health and hygiene standards, as shown in figure (82) and (83), (0 points). <u>2.7.D.</u> There are no playgrounds/other similar spaces in and/or surrounding the market (0 points).			The local government should coordinate with the market management body (which is also absent) for hiring architects and contractors to design public spaces in and around the market. Besides, these two actants should also coordinate together to operate these public spaces either by renting or selling the public spaces for tenants and leaseholders or having the local government or the market management body in charge of operating the public spaces by themselves. Building and operating public spaces in and surrounding the market will help the market function in a better way and revitalize its surrounding communities by creating areas with a greater urban vitality that attracts people, increases safety and security, and elevates the quality of life by presenting a medium where people can move actively and exchange ideas.
3. Engine for Community life	<u>3.1.</u> Free non-controlled experience	<u>3.1.A.</u> The market is free of institutional control (1 point).			Although the market exhibits a diverse free non-controlled experience, a market management body is still required to maintain this non-controlled medium in a way that fosters the diversity inside the market.
	<u>3.2.</u> The market brings diverse people together where merchants and auxiliary workers come from different communities inside and outside of Cairo like Al-Imam Al-Shaf'i, Izbit Abu Dil, Turab Al-Yahud, Izbit Abu Hashish, Arba'a Wi Nus in Nasr city, Al-Wayli, and Al-Ma'sara, Al-Minya, Bani Suwif, Al-Qalyubiyya, and Al-Fayoum. Moreover, the customers come from diverse places also in and outside of Cairo such as Downtown, Heliopolis, Helwan, Zamalek, Madinat Nasr, Maadi, Manshiyyat Nasir, Giza, and upper Egypt (1 point).				

	<p><u>3.3.</u> High level of socialization</p>	<p><u>3.3.A.</u> Before the mega-fire, the market was socially cohesive, the merchants knew and supported each other. They were socially proximate. Besides, there were market leaders who worked to manage the market's internal affairs and solve the arising problems. Passing by the mega-fire, and the revolution, the merchants exhibited a strong sense of ownership and belonging to the market, where they insisted on staying in the market to fix it, and when the government banned their existence, they returned back to the market after the revolution in the absence of the police forces. Nowadays, after the mega-fire and the revolution, the merchants managed to keep the ties connecting them (<i>1 point</i>), the proximity (<i>1 point</i>), and the sense of belonging and ownership (<i>1 point</i>), (except that the concept of having market leaders has declined).</p> <p><u>3.3.B.</u> There are no effective social coalitions (<i>0 points</i>).</p>			<p>Although a high level of socialization and a sense of community does exist at Souq Al-Tunsi as formerly explained, there is still a need for a clear (communal) market management body since its organizational mechanisms were not detected and were not clear at the time of conducting this research. The market management body should be present and act as a patron of the market who should ensure and foster a healthy social environment where all merchants, auxiliary workers, and possibly customers can feel a sense of the market community. The market management body is also responsible for facilitating the growth of social coalitions, not mentioning the major role of merchants and auxiliary workers who should work to build them in the first place.</p>
<p>4. Fostering economic development</p>	<p><u>4.1.</u> The market provides local employment opportunities for lots of merchants and auxiliary workers. On an area of 7.1 feddan, lots of merchants coming from Cairo and other governorates find a place in the market to sell their goods. Moreover, per the need-driven out of the type of commodities sold in the market, the market creates room for car drivers to transport the goods with their cars to the customers' destinations, baggers to carry the goods from the shops to the cars and from the cars to the customers' home, and technicians like carpenters, and blacksmiths (who have their tools ready with them) for setting up the goods in the customers' houses. These auxiliary workers, similar to the merchants, come from Cairo and other governorates. Hence, the market provides room for a whole system of merchants and auxiliary workers that all work together in coordination (<i>1 point</i>).</p> <p><u>4.2.</u> The market provides limited room for small and medium businesses (<i>1 point</i>).</p>				<p>The market management body should be present to work on providing more room and opportunities for small and medium businesses.</p>
<p>5. Quality urban life</p>	<p><u>5.1.</u> Increasing safety</p>	<p><u>5.1.A.</u> There are no formal/governmental security systems in the market (<i>0 points</i>), however, there is an informal communal system of security, where there is a chief person in the market who hires people for protecting the markets and the goods. In return, the merchants have to pay her for this service. This security system as the merchants clarify is not that effective for protecting their goods, but it is better</p>			<p>The market management body should work to achieve a quality urban life for the market and its surrounding urban space to create a creative comfortable environment where people are motivated to exchange, work, and enjoy. This can be achieved through applying the following from the market management body's side:</p>

	<p>than nothing, as there are lots of robbers and criminals in the area of the cemeteries (1 point).</p>			<ol style="list-style-type: none"> 1. Developing/changing the security system inside the market to be more effective. 2. Supervising the market regulators to make the setting of the market well maintained for the different types of users as well as considering disabled measures. 3. Hiring fire safety consultants for providing firefighting systems inside the market. 4. Coordinating with the mobility and transport body for providing accidents prevention measures for the market. 5. Hiring structural engineers and consultants for checking the soundness of structures and the overall setting of the market and its surrounding area.
	<p><u>5.1.B.</u> The presence of a safe setting for all types of users including women, children, the elderly, and the disabled.</p>	<p><u>5.1.B.1.</u> The setting is not well-maintained inside the market and does not consider the disabled measures (0 points). However, there are no dead ends (1 point) and hazardous materials inside the market (1 point).</p>		
	<p><u>5.1.C.</u> Avoiding potential hazards and risks such as fires, accidents, earthquakes, collapse, and landslides.</p>	<p><u>5.1.C.1.</u> There are no effective firefighting systems in the market, as a result, the market has been exposed to a mega-fire in 2010, that eroded more than 60% of its area, as well as some other minor fires in June 2016, May 2017, and August 2018 (0 points).</p>		
		<p><u>5.1.C.2.</u> There is no application for accidents' prevention measures, especially that the market is placed in a very critical urban space (under Al-Tunsi bridge, a main highway bridge), as a result of that the market is subjected to great risks of car accidents, where in June 2010, May 2017 and August 2018, car accidents happened on Al-Tunsi bridge ending up in explosions reaching the market and causing fires (0 points).</p>		
		<p><u>5.1.C.3.</u> There are no strong tolerant structures that can endure earthquakes and collapses. Most of the structures are made of untreated wooden columns/bricks and covered with corrugated sheets and straw roofs. Besides, all of the shops do not have a concrete foundation (0 points).</p>		
		<p><u>5.1.C.4.</u> There are no retaining walls at slopes around the market such as Al-Muqattam plateau overlooking the market from its eastern side (0 points).</p>		
<u>5.2.</u> Inspiring people in their daily life	<p><u>5.2.A.</u> The merchants', workers', and customers' needs are not met (0 points). Their needs at the current state of the market include having the basic services of water, energy, and waste treatment as well as having security points for achieving safety. The merchants and the workers also look forward to formalizing the market and making it more developed and organized.</p>			<p>The market management body should hold recurrent participatory meetings for problem-solving and needs satisfaction for the merchants, auxiliary workers, and consumers, as well as providing an open medium for suggestions and investing for upgrading the market's environment to make it more creative and enjoyable. The market management body should also work on resolving the issue of relocation with the government to remove the permanent threat that the merchants and the workers are exposed to.</p>
	<p><u>5.2.B.</u> There is not an enjoyable creative environment. The market is very monotonous, and there is no room for creativity since the merchants are facing the risk of relocation from the government side to the 15th of May city, so the merchants have fears that prevent them from further investing in the market to make it a more enjoyable place (0 points).</p>			

After proposing guidelines based on step 1 that addresses problems that appeared in the market through the analytical schema, the researcher moves forward to propose guidelines based on step 3 addressing the malfunctioning systems of the market that appear in the mode of production model. These guidelines tackle treating the malfunctioning systems of the market either directly by treating them, or indirectly by remediating what affects them in other systems. These guidelines are listed along with the problems in the table (32) below.

Table 32- Proposed Guidelines for the Malfunctioning Systems in the Mode of Production Model.

The mode of production pillar	The malfunctioning systems/relations	The proposed guidelines
Elements of production	<p>The supply and distribution system of the new goods is a high cost, timely, non-efficient, and non-sustainable system where:</p> <ul style="list-style-type: none"> • Most of the factories and the workshops are located far away from the market. • Each merchant alone goes on a trip to each workshop and factory with a light-heavy duty truck to transport what he will buy. • The merchants have no storage, which means that they repeat these trips on an average of every 10 days when they are out of goods (approximately 36 times per year). • For a whole year, this supply system would cost around 4,625,000 EGP for all the market and would take around 21 days for each merchant for achieving it as well as producing an average of 147,810.375 CO2 Kg for the whole merchants. 	<p>The lack of education and management (due to informality) inside the market leads to a high cost, timely, non-efficient, and non-sustainable distribution system. Instead, the merchants can arrange with factories, workshops, and distributors for more efficient supply chains of goods for all of the market not for sole merchants to save time, money, efforts, and carbon emissions. This will still allow for competitive distribution. This can be done with the market management body being the leader who manages and facilitates the supply and distribution system.</p>
	<p>The exchange system has internal malfunctioning systems such as:</p> <ul style="list-style-type: none"> • The energy system is informal where only wires are pulled from the surrounding neighborhoods to reach out to the market through the bridge to light the shops as illustrated in the analytical schema in section 4.6.3. • There are no clean water systems supplied to the market. When the users 	<p>The market has to be formalized and included in the city's urban planning so that it can receive the governmental services of having sustainable energy, water, waste, communications systems, and proper space design of shops and internal streets. This is to be done in arrangement with</p>

	<p>of the market need water, they fetch it from the nearest mosque or street water dispensers.</p> <ul style="list-style-type: none"> • There is no solid waste collection, where waste and scrap are disposed on the sides of the market and besides the railroad line as previously illustrated in section 4.6.3. • There is no telecommunication system linking the market to the surroundings. • The public transportation system (that reaches out to the market as previously examined in section 4.6.7.) has a great deficiency as it emits huge amounts of CO2 gas since it is based on fossil fuels. • The urban fabric system only includes internal streets penetrating the market, used both as driveways and walkways, and some trees and climbing plants. The internal streets show no signs of sustainability or durability, most of the internal streets are gravelly and not paved, and they accumulate piles of mud and dirt, leading to a non-healthy unclean environment as shown previously in section 4.6.3., whereas the green elements are not sufficient. • The built system of the market is made of very simple materials, such as untreated wood, bricks, straw, and corrugated sheets, these materials (especially the wood and straw) do not offer much strength, fire resistance, and durability for the market, thus they are not sustainable. On the other hand, the urban form created by the built systems is not compact, where it spreads horizontally on an area of 7.1 feddan. Thus, it creates a high land consumption with little production, little density, and energy inefficiency. Thereof, the market urban form does not cater for efficiency nor sustainability. 	<p>the market management body. This act of formalization demands a change in the political agenda of the current regime to include public markets (instead of relocating them) under its renovative plan. For the transportation system, the ministry of transport has to shift its public transport facility into a more sustainable one based on amplifying the use of renewable energies and reducing the use of fossil fuel, so that the transport and mobility system would be more sustainable, green, and eco-friendly.</p> <p>Regarding the urban fabric and the built systems, the whole market needs to be redesigned under the mentorship of the market management body and in coordination with the governmental and the communal support in an inclusive participatory design process (that includes the merchants and the auxiliary workers). This is to be done for the aim of renovating the hardscape elements, planting more softscape elements, and redesigning the built form with durable resilient materials to make it more compact and sustainable. Furthermore, the government has to eliminate the fear of relocation so that the merchants and the workers can help upgrade the market by themselves and under the market management body's mentorship and assistance, in case the market did not receive any governmental help.</p>
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<p>Relations of production</p>	<p>The technical relations have internal malfunctions such as:</p> <ul style="list-style-type: none"> • The merchants use the bridge as a cover for their shops and this augments the frequency of risks that the market is exposed to since any accident on the bridge can affect the market like the mega-fire in 2010. • The merchants use the goods for both exchange and complementing what is missing in the market in an unprofessional casual manner, for example, the merchants use the displayed furniture to sit on them, as there is no seating in the market. • The merchants use the internal open spaces between the shops as driveways, walkways, loading decks, an extension for their display area, and a place for throwing away their wastewater. This space in return demotivates the customers to walk in it since it echoes the disorder and the uncleanliness of the market. • The railroad lines provide a straight clear path passing between the market, the merchants use these railroad lines as a secondary way to move in the market as well as putting their scrap on its sides. This type of relationship puts the market at great risk of accidents and fire. <p>The social relations have internal malfunctions such as:</p> <ul style="list-style-type: none"> • The customers come from different communities, and they do not know each other, thus, they do not interact at all with each other, still, a few of them have good ties with the merchants. That shows that the market does not foster social connectivity between the customers, each other, and the merchants. • The social relationship between the merchants and the informal communal security chief and individuals is a compulsory relationship, where the merchants are obliged to pay for them in return for their protection, (the merchants and auxiliary workers are 	<p>The problems in these technical relations can be solved by the following:</p> <ul style="list-style-type: none"> • Firefighting systems and accidents prevention measures need to be taken from the market management body's side, as illustrated previously in the previous table (28). • The ignorance and unprofessionalism of the merchants in dealing with the market and the goods need to be changed by the market management body by setting professional training programs for the merchants and the workers. • The misuse of the internal open spaces and the railroad lines by the merchants can be changed by the redesign and the provision of ecosystem services from the government side after formalizing the market and including it in the city's urban planning. Once the market is redesigned and receives proper infrastructure the merchants will not have to resort to the unconventional practices they currently do. • The market management body should create a healthy social environment for the customers to interact with each other and the merchants. • By formalizing the market and having state territorial control as well as an effective market management, the informal communal security system
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	<p>not satisfied with this system and they see it as ineffective, however, they pay by force to avoid tussling with them).</p>	<p>will diminish and will be replaced with a formal one (whether communal or governmental).</p>
<p>Forces of production</p>	<p>The whole area of Souq Al-Tunsi lies in the deteriorated historical core of Cairo that entails intricate social cultural political dimensions that are intertwined together in the fabric of the place. The inhabitants of the area are classified to have a low social income with little or no education. The culture carried within these inhabitants is an informal culture based on informality and disenfranchisement, where the residents receive no ecosystem services and utilities (including freshwater, sewage, and electricity), social services (like health and education), and recreation facilities (such as green parks and entertaining public spaces). That is because, politically, the area is ignored by the local government because developing such informal areas (even when they are on a historical urban core) lies outside the main political agenda, instead the government plans to eradicate the whole area, and relocate the residents and the market.¹⁹⁷ Thus, the whole area surrounding the market lies outside the city's urban planning and lacks governmental representation and state territorial control. These cultural and political forces are reflected in the residents' social status and behavior, where they exhibit a high rate of ignorance, poor public health, and a high prevalence of theft. These forces (social, political, and cultural) are also reflected on the market and its surrounding communities where they impact and control the elements of production (SMTT systems) and the relations of production as illustrated previously in section 4.6.7.</p>	<p>The political agenda should be modified to include the development of the whole area instead of relocation. This development should be carried out on all the physical, social, educational, cultural, and economic levels so that the informal culture can be changed towards a formal one that is not deprived of the basic rights of services and facilities. Once the area receives more care and attention from the government and other civic entities, the status, and behavior of the residents, merchants, and workers will change gradually towards overall wellness. This will also impact the elements and relations of production positively leading to its betterment.</p>

¹⁹⁷ See Appendix B for more details about the government agenda and the relocation of the market.

4.8. Conclusion

In conclusion, this chapter applied the development framework to a public market in the city of Cairo, Souq Al-Tunsi. The chapter started with illustrating the state of the city of Cairo, the need for its urban regeneration, and the importance of the Cairene public markets' development in satisfying this need. Public markets in Cairo, as the chapter revealed, are major connector hubs and economic engines for various informal communities, and that amplified their importance as a leader in growth and urban regeneration¹⁹⁸. The chapter then picked Souq Al-Tunsi as the main case study based on the selection criteria, where this market is an old mega-market offering a variety of goods in a very critical urban space that is exposed to a high rate of environmental shocks and stresses, unlike other public markets¹⁹⁹. Picking Souq Al-Tunsi, the chapter demonstrated the qualitative methodology used to acquire data about this market. This qualitative methodology was complemented with secondary research that encompassed information about the market and its zone of influence including its location, context, history, background, and the type of goods that the market offers.

The chapter then analyzed Souq Al-Tunsi using the analytical schema as a first step in applying the development framework. In the analytical schema, the chapter studied how much the market is properly functioning and well-performing through examining in it the presence of the five main functions stated in the schema along with their qualitative components, factors, actants, and relations. The chapter also applied the grading system of the schema, and the calculated total grade of the market was 36 points²⁰⁰ out of 121 points. This grade reflected how much the market is missing lots of components and factors that affect its functionality, where it is functioning with only 29.75%. This percentage is in compliance with the market's current state, where the market at the time of investigations was nearly empty of customers and lacked lots of components and proper functioning systems due to removing parts of it in preparation for its relocation. At this point of time, the whole market was not functioning as it used to (also due to the COVID-19 pandemic), hence, the market systems were not as efficient as they used to be in the time of the normal functioning, and that affected the profitability of the market and caused its decline.²⁰¹

¹⁹⁸ Ismail, (1996), *The politics of space in urban Cairo*, pp. 119-132.

¹⁹⁹ Mohamed, (2011), "Under bridge" as an urban public space.

²⁰⁰ These number are only indicators not a statistical component, as illustrated in section 3.3.

²⁰¹ For more info, refer to section 4.5.2: limitations of research.

Having used the analytical schema, the chapter then applied the mode of production model on the market. In the mode of production model, the elements (SMTT systems), relations, and forces of production (non-SMTT systems) were determined with an analytical scan. This scan revealed the malfunctioning systems and elements that attributed to the poor functioning of the market such as the presence of a high cost, timely, non-efficient, and non-sustainable distribution system, the absence of the infrastructure systems, the dispersion of the built form, and the presence of negative relations and forces of production. The scan also revealed that the human aspect represented in the forces of production (the social, cultural, and political systems) has the greater influence over the Market, where it shapes it, and controls its elements of production (SMTT systems) and its relations of production.

Applying the two analytical lenses on Souq Al-Tunsi, the chapter finally proposed guidelines for developing the market in integration with revitalizing its surrounding neighborhoods and communities. The proposal of guidelines depended on step 1: integrating the missing functions, qualitative components, factors, actants, and relationships for a better functioning of the market. It also relied on step 3: treating the malfunctioning systems that appeared in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems. By that, the chapter has presented guidelines based on steps 1 and 3 for how the market can develop in relation to revitalizing its surrounding neighborhoods and communities, knowing that there were limitations in applying step 2, as it requires a team of experts as previously mentioned.

Chapter 5: Conclusion

In conclusion, this thesis studied the development of public markets through a structured framework and its contribution to the revitalization of the associated zone of influence inside a city. Marked by their rich experience, public markets create a medium of interactions, diversity, and proximity that brings people around shopping and conversation. By their prevalence, public markets have played a central role in the cities, towns, and villages as they have been crucial engines for urban development and cities formation. Not to mention their role in entrepreneurship, jobs creation, and their significance for the social development of neighborhoods and communities. Today, local governments are reviving the central role of public markets to take part in the urban regeneration and neighborhoods revitalization by their development. This crucial role includes regenerating public spaces, reviving buildings, and promoting healthy social interactions and local economic structures. Despite this interest, there has been limited scholarly attention given to the idea that fostering the growth of public markets can be a mean to develop its associated zone of influence. Limited studies have highlighted how developing public markets can be a catalyst for satisfying the need for urban growth and public space regeneration in many cities. That is why the scope of this dissertation was to fill in the gaps by studying public markets and creating a development framework that can be used for analyzing and developing any market in integration with its zone of influence revitalization. The methodology used to achieve this scope was based on a theoretical basis constituting the first three chapters, and an empirical study constituting the fourth chapter.²⁰²

Chapter one was an introductory chapter for this thesis, which provided a general introduction about the central role of public markets. Public markets as the chapter revealed are the heart, soul, and motor of cities, thus, they can be used to bring new dynamism to the city, especially to the associated deprived neighborhoods²⁰³. The chapter then provided an example of space regeneration using the market revitalization in The Old Market Square in the city of Wroclaw. The development of the Old Market Square revived the whole surrounding area resulting in “a new modern leisure square with a commercial function and a new architecture, an inviting place to relax”.²⁰⁴ Showing a real example of a development of a public market and its contribution to the revitalization of its surrounding area, the chapter finally ended with stating the problem definition, the hypothesis, the objectives, specific aims, and the methodology used in this research.

²⁰² Caramaschi, (2014), Public markets; Costa et al., (2015), Urban markets.

²⁰³ Caramaschi, (2014), Public markets.

²⁰⁴ Costa et al., (2015), Urban markets, p.48.

Chapter two continued to research further into public markets and their development over time. This chapter started by discussing the evolution of public markets since early civilization and their development across history moving from the twelfth century up to the current time. In the course of development, public markets shifted between farms and charters to large-scale marketplaces with fixed and semi-fixed shops that progressively led to the appearance of fairs. With the advancement of technology in the eighteenth century, markets tended to be more specialized and wholesale with the rise of department stores that catered for mass production at its time. Moving forward with the rise of capitalization and the development of chain stores in the twentieth century, public markets witnessed a noticeable decline and became more of free markets, however, retaining culture and heritage, and preserving the distinguished experience that differentiates them from the controlled environment of hypermarkets and department stores. Public markets were also remarked to hold freedom of institutional control, thus giving room for small and medium businesses to offer cheaper goods to the middle and lower classes of public consumers. Moreover, markets in urban centers were distinguished to offer a wide range of commodities and services, thus meeting the public demands unlike other forms of shopping and retailing. These distinct features as well as the centrality of public markets inside the cities were the main drivers for the markets' existence up to the current time.²⁰⁵

Nowadays, markets in our contemporary city may seem modern, but some medieval features still exist under disguise. Addressing the evolution of markets across time has revealed these medieval features in their current modern form and the systems that developed over time to supply certain demands in the societies. This provided a better understanding of how the market reached its current functions, components, relations, and systems tied by the surrounding context and the demand of public consumers. Addressing the growth of markets also clarified the evolution of the different social, economic, political, and regulatory systems that have developed over time inside the market. This marks the market as an object of different systems working together in integration, therefore, the researcher investigated the theories that address this issue.

The chapter briefly examined the two main theories that speak about the system composition, components, and actants: the Actor-Network Theory, the ANT, and the Assemblage theory. The chapter picked the ANT theory as the main analytical lens, as it is the only theory that taps on all types of topologies: Network, Euclidean, and Fluid, unlike the

²⁰⁵ Caramaschi, (2014), Public markets; Casson & Lee, (2011), The Origin and Development of Markets; Costa et al., (2015), Urban markets.

Assemblage theory which is based on only fluidity, exchangeability, and multiple functionalities²⁰⁶. Relations in the ANT can be direct, indirect, unidirectional, and bidirectional between the different actants. Moreover, the relations can be permanent or temporary depending on the permanence or temporariness of the actants that they are associated with. The chapter then explained the different types of objects—which are the Network, Euclidean, and Fluid objects in relation to their spatial topologies—marking the Fluid object for creating the most spatially resilient topology, thus the most sustainable space. Networks and Euclidean also assure stability of the object, that is why a successful object is “topologically multiple, existing as intersections between the different spaces: Euclidean, Networks, and Fluids”²⁰⁷. Working to demonstrate the different aspects of the ANT, the chapter concluded the theory by showing its deficiencies that comprised ignoring the human social agency with the social forces, and disregarding the dualistic nature of the world, that there exists a materialistic side and a social, cultural, and political one that shapes and affects the physical objects.²⁰⁸

Attempting to fill in the ANT gaps, the chapter used the SMTT systems approach and the Marxist theory of production. The SMTT systems approach necessitates classifying the internal systems of any object into SMTT systems, namely physical materialistic systems, and non-SMTT systems, namely social, cultural, and political systems. This is for the aim of understanding the object’s dualistic dynamics and examining how its non-SMTT systems affect and shape its other type of systems. The approach did not dictate a certain methodology for studying the systems, a gap that the Marxist theory was used to fill. The Marxist theory of production offered a method that studies how the different systems evolved, depending on the social totality of production. This method studies the different systems, examines their evolution, and investigates how the non-SMTT systems, namely the social, cultural, and political systems, are translated into the SMTT systems in a way that affects and shapes their form. The Marxist theory also dissects the social totality of production into elements, relations, and forces of production. The elements of production included production, distribution, trade, and consumption, whereas the relations spanned between technical, social, and commercial relationships. On the other hand, the forces of production were comprised of the social drivers that call for a certain type of production falling under the non-SMTT type of systems. Lastly,

²⁰⁶ Buchanan, (2015), *Assemblage theory and its discontents*.

²⁰⁷ Law, (2002), *Objects and spaces*, p.102.

²⁰⁸ Elder-Vass, (2015), *Disassembling Actor-Network theory*; Farías et al., (2010;2009;2012), *Urban assemblages*; Kärrholm et al., (2014), *Spatial resilience and urban planning*; Law, (2002), *Objects, and spaces*, p.100.; Shoaib, (2015), *Highway urban assemblage*.

the chapter showed how a certain mode of production is created over time with the change of the forces of production along with the elements and relations of production. All in all, the Marxist theory of production presented a demonstration of the dualistic world of humans and matter complementing the ANT theory and providing a methodology that studies the evolution of the systems and examines how the non-SMTT systems affect and shape the SMTT systems in a certain mode of production.²⁰⁹

Having explained the theories and approaches that can help determine the dynamic components, actants, and relations of any object without ignoring the dualistic nature of the systems, chapter three moved forward to develop a general framework for analyzing public markets and developing them in integration with their zone of influence revitalization. The general framework for development depended on first constructing an analytical schema for analyzing the dynamic components of public markets. The analytical schema was based on a qualitative methodology that included paying 14 field visits to seven different Cairene markets: Souq Al-Sayyida ‘Aisha, Souq El-Itneen, Souq Al-Tunsi, Souq Al- Jum’a, Al-Azhar street, Souq Al-‘Ataba, and Khan Al-Khalili. Observations and structured interviews were conducted in the field visits with 20 merchants, 5 auxiliary workers, and 11 customers, and the data obtained were analyzed using thematic analysis. This type of analysis was based on classifying the data into definite themes. The qualitative methodology, used to develop the schema, was complemented with secondary research that discussed the centrality of public markets, its relation to the surroundings, its various systems and components, its functioning and performance, its management and urban development, and its role on social connectivity, economic growth, and quality urban life.

Besides being based on the above-mentioned methodology, the schema also relied on the ANT theory, and it comprised the five main functions that any public market should deliver as part of being the heart of the city²¹⁰. The five main functions included exchange, urban growth and regeneration, an engine for community life, fostering economic development, and creating quality urban life²¹¹. Each function was broken down generically into a list of qualitative components, factors, actants, and relations, which all affect the performance of the function.

²⁰⁹ Blackledge, (2006), Reflections on the Marxist theory of history, p.30.

²¹⁰ Costa et al., (2015), Urban markets.

²¹¹ Ibid

Another layer of analysis was added to the schema addressing the ANT gaps to understand how the human aspect and the social drivers have greater influence over the market. That is why the chapter worked to put the Marxist theory in integration with the SMTT systems approach to come up with the mode of production model as a supplementary way of analysis with the analytical schema. The mode of production model comprised three main pillars: the elements of production, the relations of production, and the forces of production. The elements of production, which are the SMTT systems, vary between production, distribution, exchange, and consumption systems. The relations of production stem from the technical relations of production and the social relations of production, which were partially mediated by the commercial relations of production. Whereas, the forces of production, mainly the non-SMTT systems, contain the drivers that call for a certain type of production. The three main pillars, as illustrated by the chapter in the mode of production model, worked dynamically affecting each other, where the forces of production control the relations and the elements of production. Mutually, the elements of production affect the relations and the forces of production, however, with less influence than the forces of production. Similarly, the relations of production also affect the elements and the forces of production.²¹²

Having constructed the collective analytical lens for analyzing public markets, chapter three culminated the development framework with determining the main guidelines for the market's development in integration with its zone of influence revitalization. Developing these main guidelines called for marking the absent functions, qualitative components, factors, actants, and relations, as well as pointing to the malfunctioning systems that appear in the analysis phase. Afterward, the guidelines can be proposed by following three consecutive steps. The first step entails integrating the missing functions, qualitative components, factors, actants, and relationships. The second step includes determining the kind of actants and relations that best suit the context of the market and the surrounding communities, to assure stability and sustainability. Whereas the third step entails handling the malfunctioning systems prevalent in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems.

After constructing the development framework in chapter three, chapter four practically applied it to a public market in the city of Cairo, Souq Al-Tunsi. The chapter started by illustrating the state of the city of Cairo, the need for its urban regeneration, and the importance

²¹² Blackledge, (2006), Reflections on the Marxist theory of history, p.30.

of the Cairene public markets' development in satisfying this need. Public markets in Cairo, as the chapter revealed, are major connector hubs and economic engines for various informal communities. This amplifies their importance as leaders in growth and urban regeneration ²¹³. The chapter then picked Souq Al-Tunsi as the main case study based on the selection criteria, where this market is an old mega-market offering a variety of goods in a very critical urban space that is exposed to a high rate of environmental shocks and stresses, unlike other public markets²¹⁴. Picking Souq Al-Tunsi, the chapter demonstrated the qualitative methodology used to acquire data about this market. This qualitative methodology was complemented with secondary research that encompassed information about the market and its zone of influence including its location, context, history, background, and the type of goods that the market offers.

The chapter then analyzed Souq Al-Tunsi using the analytical schema as a first step in applying the development framework. In the analytical schema, the chapter studied how much the market is properly functioning and well-performing through examining in it the presence of the five main functions stated in the schema along with their qualitative components, factors, actants, and relations. The chapter also applied the grading system of the schema, and the calculated total grade of the market was 36 points²¹⁵ out of 121 points. This grade reflects how much the market is missing lots of components and factors that affect its functionality, as it is functioning with only 29.75%. This percentage is in compliance with the market's current state, where the market at the time of investigations was nearly empty of customers and lacked lots of components and proper functioning systems due to its partial removal in preparation for its relocation. At this point in time, the whole market was not functioning as it used to, also due to the COVID-19 pandemic. Hence, the market systems were not as efficient as they used to be in the time of the normal functioning of the market, and that affected the profitability of the market and caused its decline.²¹⁶

Having used the analytical schema, chapter four then applied the mode of production model on the market. In this model, the elements (SMTT systems), relations, and forces of production (non-SMTT systems) were determined with an analytical scan. This scan revealed the malfunctioning systems and elements that attributed to the poor functioning of the market such as the presence of a costly, time-consuming, non-efficient, and non-sustainable

²¹³ Ismail, (1996), *The politics of space in urban Cairo*, pp. 119-132.

²¹⁴ Mohamed, "Under bridge" as an urban public space.

²¹⁵ These number are only indicators not a statistical component, as illustrated in section 3.3.

²¹⁶ For more info, refer to section 4.5.2: limitations of research.

distribution system, the absence of the infrastructure systems, the dispersion of the built form, and the presence of negative relations and forces of production. The scan also revealed that the human aspect represented in the forces of production, namely the non-SMTT systems, has the greater influence over the market, as it shapes it and controls its elements of production (SMTT systems) and its relations of production.

Applying the two analytical lenses on Souq Al-Tunsi, the chapter finally proposed guidelines for developing the market in integration with revitalizing its surrounding neighborhoods and communities. The proposal of guidelines depended on integrating the missing functions, qualitative components, factors, actants, and relations for a better functioning market. It also relied on treating the malfunctioning systems that appeared in the mode of production model either directly by treating them, or indirectly by remediating what affects them in other systems. On account of this, the chapter has presented guidelines for how the market can develop in relation to revitalizing its surrounding neighborhoods and communities.

Looking at Souq Al-Tunsi from an overall perspective after applying the development framework, it is found that the core problems that affect its functionality are informality, lack of management, poor education, and having an informal culture. The informality of the market leads to its exclusion from the city's urban planning; thus, the market is deprived of the basic ecosystem services that should be provided by the government such as water, energy, waste, and communications systems. The lack of management along with informality made the market in need of a proper space design of shops and internal streets as well as renovating its urban fabric and built systems. The poor education and the informal culture led to a misuse of the market objects from the merchants and auxiliary workers' side, such as using the bridge as a cover for the market without mitigating its risks, using the goods in a non-professional manner, using the internal open spaces as a place for throwing their waste, resulting in disorder and uncleanliness, and using the railroad lines for storing the scrap exposing the market to a great risk of accidents and fire. The poor education and the informal culture also led to the presence of some malfunctioning systems such as the costly, time-consuming, non-efficient, and non-sustainable distribution system.

The development of the market and its surrounding area relies mainly on treating these core problems, starting with formalizing the market. This act of formalization carries within its ties having a state territorial control, introducing proper management for the market and the

whole area, and enhancing the education and the culture indirectly. Formalizing the market and the whole area demands a change in the political agenda of the current regime to include the development of Souq Al-Tunsi and its surrounding informal areas—instead of relocating them— under its renovative plan. This development should be done under the mentorship of the market management body in coordination with the governmental and the communal entities in an inclusive participatory design process to upgrade the market’s services, systems, urban fabric, and the built form in correspondence with its context. This development should also be carried out on the social, educational, cultural, and economic levels so that the informal culture can be changed towards a formal one that is not deprived of the basic rights of services and facilities. Once the whole area receives more care and attention from the government and other civic entities, the attitude and behavior of the residents, merchants, and workers will change gradually for the better.

Developing Souq Al-Tunsi and any other market through the framework affects the market’s functions, components, and systems positively, and acts as a catalyst for reforming its zone of influence. The market’s development leads to a better selling process, short efficient supply chains of goods, keeping cleanliness, renovating historic monuments in the area of the market, provision of quality infrastructure and urban fabric systems, reviving landmarks, and creating active public spaces. It also leads to fostering diversity and increasing the safety and attractiveness of the market and its surrounding area, leading to an increase in the number of customers, the profitability of the market, and the upgrade of the whole area. Thus, the development of any market through the framework impacts the market positively and acts as a catalyst for the reform of its zone of influence.²¹⁷

Developing the market by the revitalization of the neighborhood/zone of influence was another possible lens through which the development of markets and their zone of influence can be viewed. However, the researcher did not use this perspective and picked the development of the market as the main approach for developing its surrounding zone. This is because the market is the city center that drives economic, social, and urban development for its zone of influence, which can be the surrounding neighborhoods and communities in megacities, large portions of the city in mini-cities, and whole towns in town villages. Therefore, tackling the development of the city center can impact the other parts of the city stimulating its dynamism. Moreover, some cities have limited resources for developing the

²¹⁷ Note: this thesis does not aim to evaluate how the enhancement of a market can develop a better zone of influence, rather it investigates the effect of the development of the market on its associated zone of influence.

whole city, so they pick the market, which is the most influencing part of it and the center of its economic and social activities, to be developed.

Looking at the development framework from a critical point of view after examining the case study, it is noticed that the schema and the mode of production model can overlap in some areas. The schema and the mode of production model superimpose in the elements of production (SMTT systems) and the internal components and factors inside the exchange, urban growth, and regeneration functions. However, this overlap is not redundant since the same points are viewed from different perspectives leading to a more complete, holistic image of the market and its internal systems.

Having an overall look at the framework and sustainability, it is found that it contributes to the achievement of a number of sustainable development goals, *the SDGs*. The schema inside the framework well addresses some goals through its functions, components, factors actants, and relations. Examples of this addressing can be found in the fifth function, “quality urban life,” with its subdivisions, where the function attributes to achieve the third SDG, “good health and well-being”. Another example can be found in the second function, “urban growth and regeneration”, in its subdivision 2.3. “developing infrastructure,” where this component attributes to achieve the sixth and the seventh SDGs: “clean water and sanitation”, and “affordable and clean energy”. A third example can be found in the fourth function, “fostering economic growth”, where it attributes to achieving the eighth SDG, “decent work and economic growth”. The mode of production addresses some goals of the SDGs as well, for example, its forces of production pillar help achieve the fourth SDG, “quality education”. Moreover, the overall framework helps achieve the eleventh SDG, “sustainable cities and communities”, by making the market and its zone of influence inside the city more inclusive, safe, resilient, and sustainable.

Moving on to remark the limitations of this thesis, it is noted that this dissertation had three main limitations. First, the researcher could only apply the development framework on one public market, Souq Al-Tunsi, due to time and research limitations. Second, acquiring data about Souq Al-Tunsi through the conducted qualitative methodology in fall 2020 had its own limitations, where it was in parallel with the partial removal of the Souq and the pandemic of COVID-19. Thus, the researcher’s intervention at this time showcased the market in its worst case. Nonetheless, this is good for testing the development framework, as it is the first demonstration of how the development framework can be applied on a real case study that lacks numerous functions, components, factors, actants, relations, and proper functioning systems. Therefore, the analysis and the proposal of guidelines will be extensive, tackling

various components and systems, which would not have been the case if the market was well-functioning. Third, the researcher proposed guidelines based on only the aforementioned steps 1 and 3, as step 2 requires a multidisciplinary team of experts to be conducted. Applying the development framework by a multidisciplinary team of experts shall result in guidelines based on the 3 steps, and these guidelines can be further turned into a detailed agenda and an action plan for developing the market in relation to its zone of influence revitalization.

This development framework has several benefits on different levels. First, it presents a checklist for urban designers for developing or designing new markets in relation to their surrounding context in terms of looking at the urban fabric, infrastructure, links to the surroundings, built-up form, positioning, revival of landmarks, and the creation of focal points and public spaces. Second, it aids architects in examining markets in terms of the following: the design and selection of materials of the selling objects, the accessibility, the smooth internal circulation, the mobility inside the market, and the urban setting that accommodates for diverse users including the elderly and the disabled. Third, this framework also assists civil engineers by presenting a checklist that includes the construction safety of the market and its surrounding zone in terms of a well-built physical setting, strong tolerant structures, and steady retaining walls at slopes. Fourth, the development framework also presents a guide on the managerial level in terms of looking at the permanent stable operations of the market and its continuous maintenance. Fifth, this framework is beneficial for sociologists and community psychologists, where it provides a social lens for examining the market's socialization, and how it acts as an engine for community life. Finally, the framework includes an economic component looking at the economic development of the market and its associated zone of influence.

The benefits of the development framework continue to open the door for further research. By applying more research on the development framework, it can be further refined or modified, and possibly include other functions/qualitative components/factors that can make it more inclusive and holistic. This can be achieved by the coming scholars who pick this development framework and conduct more research on advancing it, as well as applying it to other existing public markets for evaluating its efficacy in achieving its purpose. By its advancement, this development framework can be turned into a general policy dealing with markets' upgrade in Cairo and their zone of influence revitalization.

References

- Abd El-Razek, M. & Nassar, A. (2010). After Al-Tunsi fire, the merchants of the Friday market state: leave us alone without compensation, and we will work without getting out from here. *Youm7*. Retrieved from: <https://www.youm7.com/story/2010/6/27/246586/>-بعد حريق-التونسي-سكان-سوق-الجمعة-سيبونا-في-حالنا-من
- Ahramonline. (2020). Photo gallery: Dazzling collections of flowers in Egypt's annual spring festival at El-Orman garden. *Ahram Online*. Retrieved from: <http://english.ahram.org.eg/UI/Front/MultimediaInner.aspx?NewsContentID=197859&newsportalname=Multimedia>
- Akhbar El-Youm. (2016). Putting out a huge fire in the Friday market, under the Al-Tunsi bridge in Sayyida Aisha district. *Akhbar El-Youm*. Retrieved from: <https://akhbarelyom.com/news/newdetails/518011/1/%E2%80%8B-إخماد-حريق-هائل-بسوق-الجمعة-أسفل-كوبرى-التونسي-بالسيدي-عائشة>
- Al-Assiouty, M. (2016). The fire of 10 compartments under Al-Tunsi bridge. *Al-Mobtada*. Retrieved from: <https://www.mobtada.com/details/511379>
- Al-Masry Al-Youm. (2010). Al-Tunsi's merchants go back to Al-Imam Al-Shaf'i's cemeteries 16 years after their relocation. *Al-Masry Al-Youm*. Retrieved March 31, 2021, from: <https://www.almasryalyoum.com/news/details/32677>
- Athar Lina. (n.d.). Al-Imam Al-Shaf'i dome conservation project. *Athar Lina*. Retrieved 4 March 2021 from: https://atharlina.com/projects/al-imam_al-shafii_dome_conservation_project/
- Awad, J. (1989). *Islamic souqs (bazaars) in the urban context: The souq of Nablus* [Master's dissertation, Kansas State University]. College of Architecture and Design, Kansas State University. Retrieved from: <https://core.ac.uk/download/pdf/33362255.pdf>
- Azazi, S. (2018). Adel leaves the Rubabiqya job and comes back to it after every other job: I love it and I am protective of it. *El-Watan*. Retrieved 9 April 2021 from: <https://www.elwatannews.com/news/details/5422995?t=push>
- Badrawi, T. (2018). The Rubabiqya merchant. *Abu Al-Hul*. Retrieved 9 April 2021 from: <https://www.abou-alhool.com/arabic1/details.php?id=38699>
- Blackledge, P. (2006). *Reflections on the Marxist theory of history*. Manchester University Press. Retrieved from: <http://ebookcentral.proquest.com>
- Buchanan, I. (2015). Assemblage theory and its discontents. *Deleuze Studies*. doi:10.3366/dls.2015.0193.
- Cairo Governorate. (n.d.). Al-Khalifa district map. *Cairo Governorate Electronic Portal*. Retrieved on March 30, 2021, from: http://www.cairo.gov.eg/ar/Maps/Pages/Hay_Map.aspx?ID=24

- Cairo Governorate. (n.d.). Southern region map. *Cairo Governorate Electronic Portal*. Retrieved on March 30, 2021, from: http://www.cairo.gov.eg/ar/Maps/Pages/Southern_Region_Map.aspx
- Cairobookstop. (2020). Cairo international book fair. *Cairobookstop*. Retrieved from: <https://cairobookstop.wordpress.com/find-a-book-in-cairo/cairo-international-book-fair/>
- Caramaschi, S. (2014). Public markets: Rediscovering the centrality of markets in cities and their relevance to urban sustainable development. *WIT Transactions on Ecology and the Environment*, 191, 1187-1197. Retrieved from: https://www.researchgate.net/publication/271417630_Public_markets_Rediscovering_the_centrality_of_markets_in_cities_and_their_relevance_to_urban_sustainable_development/citation/download
- Casson, M., & Lee, J. (2011). The origin and development of markets: A business history perspective. *Business History Review*, 85(1), 9-37. doi:10.1017/S0007680511000018
- Castanheira, G. & Bragança, L. (2012). Urban renovation of Portuguese historical centres. *Universidade do Minho, Departamento de Engenharia Civil Azurém*. Retrieved from: https://www.researchgate.net/publication/275824478_Urban_Renovation_of_Portuguese_Historical_Centres
- Chao, E. & Henshaw, J. Materials Handling and Storage. (n.d.). *United States Department of Labor, Occupational Safety and Health Administration*. Retrieved on Jan 14, 2021, from: <https://www.osha.gov/Publications/OSHA2236/osha2236.html>
- Complete France. (2016). Paris department stores. *Complete France*. Retrieved from: <https://www.completefrance.com/travel/holiday-ideas/paris-department-stores-1-3181774>
- Costa, N., Mackay, M., Perez, O., & Navarro, G. (2015). Urban markets: heart, soul, and motor of cities, making city markets the drivers of sustainable urban development. *Institut Municipal de Mercats de Barcelona (IMMB)*. Retrieved from https://urbact.eu/sites/default/files/urbact_markets_handbook_250315.pdf
- Dave, S. (2010). High urban densities in developing countries: A sustainable solution? *Built Environment*, 36(1), 9-27. Retrieved December 8, 2020, from <http://www.jstor.org/stable/23289981>
- Egypt Independent. (2019). Centuries-old Bazaar in Syria's Aleppo making slow recovery. *Egypt Independent*. Retrieved from: <https://egyptindependent.com/centuries-old-bazaar-in-syrias-aleppo-making-slow-recovery/>
- Elbalad News. (2017). Increase on-demand on the Bourivage Syrian Fair for Home Accessories with reduced prices. *Elbalad News*. Retrieved from: <https://www.elbalad.news/3043238>
- Elder-Vass, D. (2015). Disassembling Actor-Network theory. *Philosophy of the Social Sciences*, 45(1), 100–121. <https://doi.org/10.1177/0048393114525858>

- Elvik R., Fridulv S., & Per Andreas L. (2019). An analysis of factors influencing accidents on road bridges in Norway. *Accident Analysis and Prevention*, 129, 1-6. Retrieved 9 December 2020 from: <https://doi.org/10.1016/j.aap.2019.05.002>
- Epic World History. (2020). Fairs of Champagne. *Epic World History*. Retrieved from: <http://epicworldhistory.blogspot.com/2013/10/fairs-of-champagne.html>
- Farías, I., Bender, T., & Portales, U. D. (2012). Urban assemblages: How Actor-Network theory changes urban studies. *Florence: Routledge Ltd.* doi:10.4324/9780203870631
- Forbes, G.J. (2000). Urban roadway classification: Before the design begins. *Transportation Research Circular*. Retrieved December 8, 2020, from: <https://www.semanticscholar.org/paper/URBAN-ROADWAY-CLASSIFICATION%3A-BEFORE-THE-DESIGN-Forbes/026aa8b39b686784d3d9b72110bda409334a8c71>
- Galdini, R. (2007). Tourism and the city: Opportunity for regeneration. *TOURISMOS: An International Multidisciplinary Journal of Tourism*, 2 (2). Retrieved on Jan 13 from: <http://mpira.ub.uni-muenchen.de/6370/>
- Gassie, W., Englehardt, J., Wang, N., Brinkman, J., Garland, P., & Gardinali, T. (2016), Mineralizing urban net-zero water treatment: Phase II field results and design recommendations. *Water Research*, 105. Retrieved From: https://ac-els-cdn-com.libproxy.aucegypt.edu/S0043135416306820/1-s2.0-S0043135416306820-main.pdf?_tid=0f84d62a-0ed5-42d3-ab3b-ea9937f12e4b&acdnat=1543532128_d110096546b4d3668001c96f0da7dfdd
- Google Earth. (2021). Souq Al-Ataba, Al-Muski, Shar' El-Khayyamiyya, Khan Al-Khalili, Wikalat El-Balah and Souq Al-Ghuriyya's location. *Google Earth*. Retrieved on 7 April 2021.
- Google Earth. (2021). Souq Al-Fustat's location. *Google Earth*. Retrieved on 7 April 2021.
- Google Earth. (2021). Souq Al-Itneen and Al-Sayyida Aisha's location. *Google Earth*. Retrieved on 7 April 2021.
- Google Earth. (2021). Souq Al-Tunsi and Souq Al-Jum'a's location. *Google Earth*. Retrieved on 7 April 2021.
- Graber, S. (2013). Reassessing the merchants' role in a globalized economy. *International Development Policy*, 4.2(1), 153-193. Retrieved on Jan 14, 2021, from: <https://doi.org/10.4000/poldev.1636>
- Habib, F., Peimani, N., & Reza Daroudi, M. (2013). Urban deteriorated fabric regeneration according to public open space enhancement, case study: Tabriz. *World Applied Sciences Journal*. Retrieved on Jan 13 from: DOI: 10.5829/idosi.wasj.2013.21.8.119
- Haven, P., & Gutin, O. (2015). Fact sheet: Vehicle efficiency and emissions standards. *Environmental and Energy Study Institute EESI*. Retrieved on 8 April 2021 from: <https://www.eesi.org/papers/view/fact-sheet-vehicle-efficiency-and-emissions-standards>

- Hirtle S. (2008). Wayfinding, landmarks. In: Shekhar S., Xiong H. (eds) *Encyclopedia of GIS*. Springer. Retrieved from: https://doi.org/10.1007/978-0-387-35973-1_1471
- Howeidy, A., Shehayb, D., Goll, E., Abdel Halim, K., Sejourne, M., Gado, M., ... Cobbett, W. (2009). Cairo's informal areas between urban challenges and hidden potentials. *GTZ Egypt: Participatory Development Programme in Urban Areas (PDP)*. Retrieved from: <https://www.citiesalliance.org/resources/knowledge/cities-alliance-knowledge/cairos-informal-areas-between-urban-challenges-and>
- Ibrahim, S. (2020). Decision-making methodology between revitalization and rehabilitation of world heritage city centers, case study: The ancient city of Aleppo (Syria). *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol. XLIV-M-1-2020, 2020. Retrieved from: <https://www.researchgate.net/publication/343203020>
- ISDF. (n.d.). About the development facility. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/AboutGov.aspx?about=6>
- ISDF. (n.d.). Souq Al-Qunayyisa project detail. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/ProjectsDetails.aspx?project=18#>
- ISDF. (n.d.). Souq Ghaza project detail. *The Informal Settlements Development Facility ISDF*. Retrieved on 15 September 2021, from: <http://www.isdf.gov.eg/ProjectsDetails.aspx?project=15#>
- Ismail, S. (1996). The politics of space in urban Cairo: Informal communities and the state. *The Arab Studies Journal*, 4, (2), 119-132. Retrieved from: <https://www.jstor.org/stable/27933703>.
- Kang, J.E., Ahn, K. U., Park, C. S., & Schuetze, T. (2015). A case study on passive vs. active strategies for an energy-efficient school building design. *8th Conference of the International Forum on Urbanism (IFoU)*. Retrieved from: https://www.researchgate.net/publication/300250245_A_Case_Study_on_Passive_vs_Active_Strategies_for_an_Energy-Efficient_School_Building_Design
- Kärrholm, M., Nylund, K., & Prieto de la Fuente, P. (2014). Spatial resilience and urban planning: Addressing the interdependence of urban retail areas. *Cities*, 36(1), 121-130. Retrieved from: <https://doi.org/10.1016/j.cities.2012.10.012>
- Khalafawi, S. (2019). Zinin market frees Boulaq Al-Dakrur from flea vendors. *Youm7*. Retrieved from: <https://www.youm7.com/story/2019/10/17/116/4461668/-سوق-زينين-يُخلص-بولاق-الدكرور-من-الباعة-الجائلين-إنشاء>
- Khalifa, M. A. (2011). Redefining slums in Egypt: Unplanned versus unsafe areas. *Habitat International*, 35(1), 40-49. <https://doi.org/10.1016/j.habitatint.2010.03.004>

- Law, J. (2002). Objects and spaces. *Theory, Culture & Society*, 19(5-6), 91-105.
doi:10.1177/026327602761899165
- Lehmann, S. (2010). *The principles of green urbanism: Transforming the city for sustainability*. Earthscan.
- Mahgoub, M. (2019). See the difference, Zinin Market turns from a slum to a civilized area. *Sout Al-Omma*. Retrieved from: <http://www.soutalomma.com/Article/892552/-شوف-الفرق-سوق-زينين-يتحول-من-عشوائيات-إلى-منطقة-حضارية>
- McMorrow, D. (2011). Methods for remote determination of CO₂ emissions. *Office of Research & Development for National Security, Federation of American Scientists*. Retrieved on 16 March 2021 from: <https://fas.org/irp/agency/dod/jason/emissions.pdf>
- McMurtry, J. (2015). *Structure of Marx's world-view*. Princeton University Press.
- Ministry of Environment EEAA. (2018). Egypt's first biennial update report to the United Nations framework convention on climate change. *Ministry of Environment, Egyptian Environmental Affairs Agency*. Retrieved on 12 April 2021 from: <http://www.eeaa.gov.eg/portals/0/eeaaReports/N-CC/BUR%20Egypt%20EN.pdf>
- Mohamed, H. (2011). "Under Bridge" as an urban public space in the Egyptian city, Tunisy region-south of Cairo-The case of Souk El-Gom'a [Master's dissertation, Cairo University]. Faculty of Engineering, Cairo University.
- Morrow, R. (1986). [Review of *In the Tracks of Historical Materialism*, by P. Anderson]. *The Canadian Journal of Sociology / Cahiers Canadiens de Sociologie*, 11(4), 469–473.
<https://doi.org/10.2307/3341062>
- Moss, M., Kaufman, S., & Townsend, A. (2006). The relationship of sustainability to telecommunications. *Technology in Society*, 28(1–2). Retrieved on Jan 14, 2021, from: <http://www.sciencedirect.com/science/article/pii/S0160791X05000643>
- Nassar, D., & Elsayed, H. (2018). From informal settlements to sustainable communities. *Alexandria Engineering Journal*, 57(4), 2367–2376. Retrieved from: doi:10.1016/j.aej.2017.09.004.
- National Renewable Energy. (2015). *Laboratory of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy*. Retrieved from: https://www.energy.gov/sites/prod/files/2017/08/f35/net_zero_new_buildings.pdf
- OECD. (n.d.). Rural-urban linkages. *Organization for Economic Co-operation and Development*. Retrieved on December 6, 2021, from: <https://www.oecd.org/gov/rural-urban-linkages.htm>
- Omar, F. (2017). The explosion of a private car on Al-Tunsi Bridge and the escape of its driver. *Masrawy*. Retrieved from: https://www.masrawy.com/news/news_cases/details/2017/5/8/1083866/-بالصور-تفحم-سيارة-ملاكي-بمنزل-كوبري-التونسي-ونجاة-السائق

- Orosdi Back. (2020). Orosdi Back department stores and general wholesalers. *Orosdi Back*. Retrieved from: <http://www.orosdi-back.com/>
- Pacheco, P. (2017). Public spaces: 10 Principles for connecting people and the streets. *The City Fix, World Resources Institute*. Retrieved January 8, 2021, from: <https://thecityfix.com/blog/public-spaces-10-principles-for-connecting-people-and-the-streets-priscila-pacheco/>
- Pannozo, F. (2013). Policy paper on the role of urban markets for local development and urban regeneration. *Central Markets Project*. Retrieved from: http://www.centralmarkets.eu/files/Study_on_the_role_of_urban_markets.pdf
- Raines, F. (2000). Playing from strength: The market power of cities. *The Brookings Institution*. Retrieved on 14 Jan 2021 from: <https://www.brookings.edu/articles/playing-from-strength-the-market-power-of-cities/>
- Rockenbach, B., Gintis, H., Bowles, S., Boyd, R., & Fehr, E. (2007). Moral sentiments and material interests—The foundations of cooperation in economic life. *Journal of Economics*, 90(2), 215-218. Retrieved from: <https://doi.org/10.1007/s00712-006-0236-0>
- Shoaib, H. (2015). *Highway urban assemblage: A strategy for the regeneration of public spaces* [Doctoral dissertation, Cairo University]. Faculty of Engineering Cairo University.
- Sims D., Sejoume, M., & El Shorbagi, M. (2003). Understanding slums: Case studies for the global report, the case of Cairo, Egypt. *UCL DPU projects*. Retrieved on 19 April 2021 form: https://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Cairo.pdf
- Sims, D. (2008). Urban sector update. *World Bank*. Retrieved from: <https://documents1.worldbank.org/curated/en/749891468023382999/pdf/411780v10REVIS1Box0327393B01PUBLIC1.pdf>
- Song, Y. (2013). Infrastructure and urban development: Evidence from Chinese cities. *Lincoln Institute for Land Policy*. Retrieved from: <https://www.lincolninst.edu/publications/conference-papers/infrastructure-urban-development>
- The National Institute of Building Sciences U.S. Department of Energy. (2015). A common definition for zero energy buildings. *U.S. Department of Energy*. Retrieved From: https://www.energy.gov/sites/prod/files/2015/09/f26/bto_common_definition_zero_energy_buildings_093015.pdf
- Therborn, G. (1976). *Science, class, and society: On the formation of sociology and historical materialism*. NLB.
- Tracey-White, J. (2003). *Planning and designing rural markets*. FAO. Retrieved from: <http://www.fao.org/3/y4851e00.htm#Contents>
- Tracey-White, J. (1999). *Market infrastructure planning, a guide for decision-makers*. FAO. Retrieved from: <http://www.fao.org/3/x4026e/x4026e06.htm#bm06>

- UN Secretariat, The Department of Economic and Social Affairs of the United Nations. (2013). UN world economic and social survey 2013. *Sustainable Development Challenges*. Retrieved from:
https://www.researchgate.net/publication/255708480_UN_World_Economic_and_Social_Survey_2013_Sustainable_Development_Challenges
- Vashisth, A., Kumar, R., & Sharma, S. (2018). Major principles of sustainable transport system: A literature review. *International Journal for Research in Applied Science & Engineering Technology*, 6. Retrieved on Jan 14, 2021, from:
<https://www.researchgate.net/publication/323336900>
- Visconti, L. M., Minowa, Y., & Maclaran, P. (2014). Public markets: An ecological perspective on sustainability as a megatrend. *Journal of Macromarketing*, 34(3), 349–368. Retrieved on 14 Jan 2021 from: <https://doi.org/10.1177/0276146714525201>
- Wirtz, J. (2018). Winning in service markets: Crafting the service environment. *World Scientific*, 8, 24. Retrieved 8 December 2020 from:
https://www.researchgate.net/figure/Design-Elements-of-A-Retail-Store-Environment_tbl1_319350454
- Worldometer. (2021). Egypt CO₂ emissions. *Worldometer*. Retrieved on 11 April 2021 from:
<https://www.worldometers.info/co2-emissions/egypt-co2-emissions/>
- Yaghi, A. (2017). Restoration protocol in conflict zones, practical insights from the old city of Aleppo. *Cologne Institute of Conservation Science*. Retrieved from:
https://www.academia.edu/36666862/Restoration_Protocol_In_Conflict_Zones_Practical_Insights_From_The_Old_City_Of_Aleppo_
- Zhang, X., Qing, P. & Yu, X. (2019). Short supply chain participation and market performance for vegetable farmers in China. *Australian Journal of Agricultural and Resource Economics*, 63, 282-306. <https://doi.org/10.1111/1467-8489.12299>
- ZWIA. (2018). Zero waste definition. *The Zero Waste International Alliance, ZWIA*. Retrieved on Jan 14, 2021, from: <http://zwia.org/standards/zw-definition/>

Appendices

Appendix A

This appendix illustrated the calculations for the new goods supply systems based on primary research methods, as shown below:

- The estimated time for a round trip to fetch the goods by each merchant inside Cairo is 3 hours.
- The estimated time for a round trip to fetch the goods by each merchant outside Cairo is 1 day.
- Merchants repeat these trips on an average of every 15 days when they are out of goods since they have no storage, that means that they go on $365/15 = 24.3 \approx 24$ trips per year.
- The estimated average time for all the round trips spent by each merchant per year = $24 \text{ trips} * [(24 \text{ hours} + 3 \text{ hours})/2] = 324 \text{ hours} = 13.5 \text{ days} \approx 14 \text{ days}$.
- The estimated money spent on a round trip to fetch the goods by each merchant inside Cairo is 500 EGP.
- The estimated money spent on a round trip to fetch the goods by each merchant outside Cairo is 2000 EGP.
- The average number of merchants inside the market is 80.
- The estimated average money for all the round trips spent by all the merchants per year = $80 \text{ merchant} * 24 \text{ trips} * [(2000 + 500)/2] = 2,400,000 \text{ EGP}$.
- The estimated average distance for a one-way trip inside Cairo to fetch the goods is 20 Km, and for a round trip is 40 Km.
- The estimated average distance for a one-way trip outside Cairo to fetch the goods is 181 Km, and for a round trip is 362 Km.
- The carbon emissions emitted out of a single light-heavy duty truck operated by diesel oil as shown in below figure (104) is 318 CO₂ gm/tons mile equivalent to 198.75 CO₂ gm/tons Km²¹⁸.
- The estimated average carbon emissions for all the round trips spent by all the merchants per year = $198.75 * [(40 + 362)/2] * 24 * 80 = 76,701.6 \text{ CO}_2 \text{ Kg}$.

²¹⁸ Haven & Gutin, (2015), Fact sheet.

TABLE 2: 2014 - 2027 Medium- and Heavy-Duty Vehicle Emissions Standards								
CO2 grams per ton-mile ¹				2014-16	2017	2021	2024	2027
Combination Tractors	Day Cab	Class 7 26,000-33,000 lbs	Low Roof <120"	107	104	97	90	87
			Mid Roof	119	115	107	100	96
			High Roof >148"	124	120	109	101	96
		Class 8 >33,000 lbs	Low Roof <120"	81	80	78	72	70
			Mid Roof	88	86	84	78	76
			High Roof >148"	92	89	86	79	76
	Sleeper Cab	Class 8 >33,000 lbs	Low Roof <120"	68	66	70	64	62
			Mid Roof	76	73	78	71	69
			High Roof >148"	75	72	77	70	67
				2018-2020	2021-23	2024-26	2027	
Trailers	Dry Box	Long (>50')		83	81	79	77	
		Short (<50')		144	142	141	140	
	Refrigerated Box	Long		84	82	81	80	
		Short		147	146	144	144	
				2014	2017	2021	2024	2027
Vocational Vehicles	CI Engines (Diesel)	Light Heavy Duty (Class 2b - 5) 8,501-19,500 lbs	Urban			296	284	272
			Multi-purpose	388	373	305	292	280
			Regional			318	304	292
		Medium Heavy Duty (Class 6-7) 19,501-33,000 lbs	Urban			188	179	172
			Multi-purpose	234	225	190	181	174
			Regional			186	178	170
		Heavy Heavy Duty (Class 8) >33,000 lbs	Urban			198	190	182
			Multi-purpose	226	222	200	192	183
			Regional			189	182	174
	SI Engines (Gasoline)	Light Heavy Duty (Class 2b - 5) 8,501-19,500 lbs	Urban			320	312	299
			Multi-purpose	388	373	329	321	308
			Regional			343	334	321
		Medium Heavy Duty (Class 6-7) 19,501-33,000 lbs	Urban			203	197	189
			Multi-purpose	234	225	205	199	191
			Regional			201	196	187
		Heavy Heavy Duty (Class 8) >33,000 lbs	Urban			214	208	196
			Multi-purpose	226	222	216	210	198
			Regional			204	199	188
CO2 grams per brake horsepower-hour ²				2014	2017	2021	2024	2027
Combination Tractor Engine	Medium Heavy Duty			502	487	479	469	466
	Heavy Heavy Duty			475	460	453	443	441
Vocational Diesel Engine	Light Heavy Duty			600	576	565	556	553
	Medium Heavy Duty			600	576	565	556	553
	Heavy Heavy Duty			567	555	544	536	533

Figure 104- Medium-Heavy Duty Vehicle's Emissions Standards (Haven & Gutin, 2015).

This appendix also illustrates the calculations for the used goods supply systems as shown below:

- The estimated time for a round trip to fetch the goods by each merchant inside Cairo is 2 hours.
- Merchants spend fewer trips to fetch the used goods than the new goods (around 18 trips per year) because the Rubabiqya persons most often come and distribute the used goods to the merchants in the market.
- The estimated average time for all the round trips spent by each merchant per year= 18 trips* 2 hours = 36 hours = 1.5 days.
- The estimated money spent on a round trip to fetch the goods by each merchant inside Cairo is 350 EGP.
- The average number of merchants inside the market is 80.
- The estimated average money for all the round trips spent by all the merchants per year = 80 merchant* 18 trips* 350 = 504,000 EGP.
- The estimated average distance for a one-way trip inside Cairo to fetch the goods is 13 Km, and for a round trip is 26 Km.
- The estimated average carbon emissions for all the round trips spent by all the merchants per year = $198.75 * 26 * 18 * 80 = 7,441.2 \text{ CO}_2 \text{ Kg}$.

Appendix B

The first attempt of relocating the market

In June 2010, Souq Al-Tunsi was exposed to a mega-fire that was caused by a car accident on Al-Tunsi's bridge as shown below in figure (105). This mega-fire destroyed more than 60% of the whole market area according to preliminary studies conducted by the ministry of internal affairs. Upon the fire in July 2010, Cairo's governor banned the existence of Souq Al-Tunsi and expelled all the merchants by force in August 2010. The government promised the merchants of Souq Al-Tunsi to relocate them in a fully serviced zone in district 27 in the 15th May city. This zone was not built or provided by services as shown below in figure (107), thus the relocation was never fulfilled.²¹⁹



Figure 105- A mega-Fire in Souq Al-Tunsi Caused by a Car Accident (Al-Assiouty, 2016).

²¹⁹ Akhbar El-Youm, (2016), Putting out a huge fire on the Friday market; Al-Assiouty, (2016), The fire of 10 compartments under El-Tonsi bridge; Mohamed, (2011), "Under bridge" as an urban public space; Omar, (2017), The explosion of a private car on El-Tonsi Bridge.



Figure 107- The Zone Specified for the Relocation of Souq Al-Tunsi in the 15th May City (Mohamed, 2011).

In the 25th January revolution, with the absence of governance and the security forces, the merchants came back and rebuilt Souq Al-Tunsi under the bridge. With paving the roads and re-planning the whole area after the mega-fire from the government side, the merchants rebuilt the Souq differently this time, where they started to build with bricks, wood, and corrugated sheets, as shown below in figure (108); still few use wooden columns and straw in covering roofs. The merchants also respected the new road borders which allowed cars to enter and move within the area of the Souq, as shown below in figure (106).²²⁰



Figure 106- The Rebuilt of Souq Al-Tunsi in 2012 (Mohamed, 2011).

²²⁰ Mohamed, (2011), "Under bridge" as an urban public space.



Figure 108- The Internal Shops After the Rebuilt of Souq Al-Tunsi in 2012 (Author's Footage, 2020).

The Second attempt of relocating the market

In 2020, the local government decided to expand the lanes of Al-Tunsi Bridge to facilitate the traffic movement on the Autostrad road. As the interviews reveal, this expansion required the removal of the whole market and some of the cemeteries on both sides by force as shown below in figure (109), (110), (111), and (112). In return, the government has promised the merchants and the workers to relocate the market at Turab Al-Yahud at the end of the Autostrad road. The merchants refused this relocation, as the capacity of the new proposed market is less than the old market. This will result in giving the merchants small shop areas (around 3m x 3m, unlike the old shop areas that reached 12m x 3m) that will not accommodate displaying most of the goods. Moreover, not all of the merchants will be relocated as the new place has a smaller gross area than the original market, so some of the merchants will be shop-less. The merchants also resisted the relocation because the old Souq under the bridge is a national well-known market that is popular to customers all over Egypt, and the new place will need a lot of time to get known for the customers, something that will affect the turnout of the market for its first 5 years as the merchants mentioned.



Figure 111- The Expansion of Al-Tunsi Bridge (Author's Footage, 2020).



Figure 110- The Removal of Part of the Market and the Cemeteries by Force (Author's Footage, 2020).



Figure 109- The Damage of the Market After Removing Parts of it by Force (Author's Footage, 2020).



Figure 112- Using a Drill for Building the Bridge Expansion (Author's footage, 2020).

Inclusion or eviction?

With the spread of slums and informality in Cairo as formerly discussed in section 4.2., The government founded The Informal Settlement Development Facility, the ISDF, in 2008 (known now as the UDF) for the management of informal areas in Egypt. The UDF categorized the slum areas into two categories:

- Unsafe category:
 - Group 1: buildings in places endangering human life.
 - Group 2: deteriorated buildings of low resistance to natural disasters.
 - Group 3: threats to inhabitants' health.

- Group 4: threats to the stability of the inhabitants in terms of lack of ownership or freedom in dealing with their properties.
- Unplanned category:
 - Illegally acquired land.
 - Violating the building laws and regulations.²²¹

As determined by the UDF, the government's public policy for dealing with the unplanned areas depended on preventive approaches that included belting programs, urban growth boundaries, and prohibiting the construction on agricultural lands and desert lands owned by the state. Whereas the government's public policy for dealing with the unsafe areas depended on interventionist approaches that included slum eviction, demolition, and relocation or in situ participatory slum upgrading.²²²

Because Souq Al-Tunsi was under the unsafe category second grade, (where it included buildings in locations threatening human life and deteriorated buildings of low resistance to natural disasters), it was set in the government eviction, demolition, and relocation plan. However, the government could have dealt with this special urban area with another approach based on regenerating public spaces under bridges. The government could have rebuilt the whole market taking all the safety standards and providing the zone with eco-systems services, as part of smartly using the empty space under the bridge. As the interviews reveal, the merchants prefer to stay under the bridge after its expansion, highlighting the potential benefits that the expansion gives to the place as a cover and a shelter. Moreover, the market in its old location is well known to the Egyptians across Egypt, and the merchants will want to trade in the place that is popular nationwide. That is why the merchants are eager to formalize their market and license their shops in the same place while paying reasonably priced rents to the government, as well as investing in the market for the sake of its upgrade. The government should use this willingness to create a participatory design for the market under the bridge after its expansion. All in all, the government's political agenda could have been modified to include the development of the whole area instead of relocation.

²²¹ Khalifa, M. A. (2011). Redefining slums in Egypt: Unplanned versus unsafe areas. *Habitat International*, 35(1), 40-49. <https://doi.org/10.1016/j.habitatint.2010.03.004>; Nassar & Elsayed, (2018), From informal settlements to sustainable communities ; Sims et al., (2003), Understanding slums.

²²² Khalifa, (2011), Redefining slums in Egypt; Sims, D. (2008). Urban sector update. *World Bank*. Retrieved from: <https://documents1.worldbank.org/curated/en/749891468023382999/pdf/411780v10REVIS1Box0327393B01PUBLIC1.pdf>

Appendix C

The observations and the interviews, that have been conducted with 20 merchants, 5 auxiliary workers, and 11 customers in Souq Al-Sayyida ‘Aisha, Souq El-Itneen, Souq Al-Tunsi, Souq Al- Jum’a, Al-Azhar street, Souq Al-‘Ataba, and Khan Al-Khalili, were structured as follows:

1. How often do you come to this market?
2. Do you go to other public markets? If yes, please specify.
3. How would you describe this market? (crowded, enjoyable, informal, cheap...etc.)
4. When does this market operate? And is it a permanent/1–2-day market/other?
5. What does the market offer?
6. Do you think public markets are important for the city?
7. Do you feel safe in the market?
8. What do you think of the built environment of this market? (urban fabric, density, water, waste, materials, and energy systems)
9. Are there any facilities or services that feed the market?
10. How do you generally reach out to the market and circulate in it? (walk/cycle/ride motorbikes/drive cars/take buses/microbuses?)
11. Are there any political powers that control or affect the market?
12. What do you think of the social environment of this market? how do people interact over here? Are they close, intimate, do they help each other, or do they work on their own? Do you feel a sense of community here?
13. Does the market provide local employment opportunities?
14. For vendors:
 - How are your display, storage, and exchange space structured? Are they fluid/semi-fluid/ fixed? And what are they made of?
 - What are the pros and cons of your selling object?
 - What are the challenges and potentials that these components offer to you, to the place, and to the other users?
15. What are the relations of production, distribution, exchange, and consumption in this market? And how are they interpreted physically on the existing objects and the flow and pattern of people and goods?
16. Does the market have any public spaces associated with it? If yes, does the market have a vital role in regenerating these public spaces?

Appendix D

The observations and the interviews, that have been conducted with 13 merchants, 3 auxiliary workers, 5 customers in Souq Al-Tunsi, and an urban designer in the ministry of housing, utilities, and urban communities, are structured as follows:

Information about merchants and workers

1. Please state your background and your place of residence.
2. How often do you come to this market?
3. How much time do you spend here each day?
4. Do you go to other public markets? If yes, please specify.
5. Why do you choose to come and sell in this market over others? Is it near to your residence?

Information about customers

6. Please state your background and your place of residence.
7. How often do you come to this market?
8. How much time do you spend here each day?
9. Do you go to other public markets? If yes, please specify.
10. Why do you choose to come and buy from this market over others? Is it near to your residence, does it offer commodities at cheap prices, does it provide goods that are nowhere else?

Users' (merchants/workers/customers) perceptions about the market

11. How would you describe this market? (crowded, enjoyable, informal, cheap...etc.)
12. Do you come alone or with family, friends, neighbors, others...etc.?
13. What is it that distinguishes this market from other markets?
14. Do you think public markets are important for the city?
15. Do you feel safe in this market?

Market's operations and logistics

16. What does this market offer?
17. How often does this market operate? all the weekdays or on particular days? What are the working hours of this market?
18. Are the market spots owned/rented by merchants?
19. What is the relation of this market to nearby communities?
20. For vendors, do you pay taxes to the government?

21. Is there a local association for the merchants and workers working here? if yes, what does it do?

The market's built-environment, infrastructure, and mobility

22. What do you think of the built environment of this market? (urban fabric, density, water, waste, materials, and energy systems)
23. Does the built environment need renovation?
24. Are there any facilities or services that feed the market?
25. How do people reach the market and move in it? (walk/cycle/ride motorbikes/drive cars?)
26. What are the access points of the market? Are they well defined?
27. Where are the nodes in this market? and why do you think people gather there?

Market's social, political, and economic realm

28. Are there any political powers that control or affect the market?
29. What do you think of the social environment of this market? How do people interact over here? Are they close, intimate, do they help each other, or do they work on their own? Do you feel a sense of community here?
30. Does the market bring diverse people from different communities together?
31. Does the market provide local employment opportunities?
32. Does the market host local economic structures?
33. How much money do you spend here (for consumers) or earn on a monthly basis (for vendors)?

The exchange objects of the market

For vendors

34. What do you use for displaying your goods, and where is your display area?
35. Where do you store your commodities?
36. Do you have a specific fixed spot for selling your goods, or is it movable?
37. What is your shop/booth made of? (fluid/semi-fluid/fixed components) and what is the percentage of these components relative to each other?
38. What are the advantages and disadvantages of these components?
39. Are these components sustainable/resilient? (mentioned in the previous question)
- What are they made of? (natural materials/recycled materials/other materials)
 - What are their multiple uses, or do they have a single-use?
 - Are these objects durable?
 - Are they cheap?

- Are they fixed or foldable and easily portable? If portable, how and when do you fold, dismantle, and move these components across the market?
 - Can you easily reconstruct your space using these components?
40. What are the challenges and potentials that these components offer to you, to the place, and to the other users?

The market's mode of production

41. What is the current mode of production inside the market? its elements, relations, and forces?
42. How is the mode of production interpreted physically on the existing objects, and the flow and pattern of people and goods in and outside the market?
43. How can the current mode of production be tied to the development of markets and the upgrade of the associated zone of influence?

Market's development:

44. Has the market undergone any renovations? When, why, and what specifically has been renovated?
45. Does the market have any public spaces associated with it? If yes, does the market have a vital role in regenerating these public spaces?
46. In your opinion, how can this market develop?
47. For vendors: If this spot is yours what are you going to do?

For urban designers concerned with regulating the market:

1. If taken into consideration as part of the city planning policies and strategies, how can the market be a mean to stimulate the dynamism of its zone of influence?
2. Are there any development strategies for this public market that can both develop the market and enhance its surrounding urban landscape?
3. Do you have any other comments?

Appendix E

The zone of influence of the market

It is the area affected by the market's performance, functioning systems, and components, it can be the surrounding neighborhoods and communities in megacities and large portions of the city in mini-cities, and whole towns in town villages. It can include planned/unplanned, formal/informal areas.

Determining the zone of influence

Determining the zone of influence can be achieved in a detailed manner through the process of analysis using the schema and the mode of production model, where the analysis phase is designed in a way that shows which areas affects and are being affected by the market, thus determining the zone of influence of the market. As an aid for the readers/scholars in this determination, a brief guideline summarizing how the zone of influence of a market can be determined through the analysis phase of the development framework, is presented as follows:

- Examining the distribution and supply systems and their impact on the market and its area of influence, in terms of the impact of the transportation acts and the logistics between the supply points and the market on the neighborhoods and roadways that lies between them.
- The different communities that are being tied to the market such as the merchants and auxiliary workers communities and the customers' communities.
- The district's main axis that is connected to the market that affects and is affected by it.
- The public transport facilities and the social and commercial facilities that are tied to the market affecting it and vice versa.
- The close surrounding urban space that is impacted by the built-up density of the market.
- The surrounding facades, historic monuments, ancient building, landmarks, focal points, and public spaces that affects the market and vice versa.
- The rural communities (if any) that are linked to the market.
- The surrounding areas/neighborhoods whose infrastructure and urban fabric systems are linked to the market.
- The surrounding areas/neighborhoods whose safety measures (in terms of firefighting, accidents' prevention, and strong tolerant structures) are linked to the market and vice versa.