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Recommended Citation

N. El Hama and M. Helmy 2024 IOP Conf. Ser.: Earth Environ. Sci. 1283 012014 DOI 10.1088/1755-1315/1283/1/012014

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To cite this article: N. El Hama and M. Helmy 2024 *IOP Conf. Ser.: Earth Environ. Sci.* **1283** 012014

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Humanising Commercial Streets as a Tool for Social Sustainability

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Abstract. Commercial Streets are the beating heart of any city, the hubs of leisure, business, and social gatherings, in which they also reflect cultures and be used to assess the level of well-being of citizens. Recently, due to the world population increase and other various factors, such as excessive urbanism and the domination of vehicle movement over pedestrianization rights, some commercial streets suffer from dehumanisation causes and symptoms. Those vary between substandard planning and construction, inhospitable landscaping, and excessive visual pollution, among other causes and symptoms. Thus, this research investigates various Humanisation strategies adopted worldwide. It discusses the potential of applying technological, spatial/physical, and social strategies to (re)Humanise commercial streets, using Othman Ibn Affan Street in Heliopolis as an applied case study. It suggests a rating system that could be adopted to measure the standard expected qualities of commercial streets. The research follows a mixed-method approach and uses various research tools, such as literature review, archival, critical analysis, observation study, and survey questionnaire to achieve its aim, which is creating a theoretical framework to achieve the Humanisation qualities in commercial streets. Through a critical discussion, the research determines in its developed framework that a combination of several defined Humanisation qualities is needed to (re)create Humanised commercial streets.

1. Introduction

Commercial streets are a very popular type of public space, which is appreciated and used by all community members as they generate social and economic benefits, as well as offer innumerable services. Due to their nature, commercial streets maintain the users' well-being by offering welcoming, efficient, and human-friendly environments with minimal challenges or discomfort. Fulfilling basic human needs in commercial streets can be achieved if they are designed according to standards and codes, yet does that qualify them to be Humanised?

Humanisation is a term that was coined and debated in the urban context in the late 20th century, and it is the aspiration of making public spaces more human-centralized by adding tangible and intangible features that ameliorate the user experience while eliminating those that negatively impact the space's performance (GENECON, 2011). Alabed concluded that the Humanisation of urban commercial streets is the act of basing design, functions, and services on pedestrians and prioritizing them over vehicles (Alabed et al., 2021). Yet, currently, the design of many commercial streets disregards human values, rather immense consideration is given to economic aspects resulting in an alleviation of user experiences. Consequently, dissatisfaction towards shopping streets increased in many cities, especially Cairo, leading to their negligence and devaluing besides, a deterioration of social interaction among citizens.

Many scholars debated the Humanisation of public spaces, such as (Ahmed, 2017), (Persson et al., 2014), and (Almahmoud et. al., 2018) who have examined the Humanisation qualities in streets in general or studied applying the human scale in public spaces (Radwan et al., 2019). While other scholars discussed



the attributes of successful commercial streets, such as Aly T. (2017), other research papers discussed the impact of public spaces' design on human behaviour (Abdelgadir et al., 2019). Farahani and others (2015), (Harb, 2016), (Fouad, 2019) have explored the social life, sustainability, and the vibrancy of commercial streets. Yet, this research is specifically centered on Humanising commercial streets, which immensely impact a community's well-being. Therefore, this research intends to emphasize commercial streets' significance and value, especially to Egyptian culture.

This research aims to develop a theoretical framework that can be adopted to re/design commercial streets, following Humanisation strategies and qualities. It includes an in-depth critical review of related literature and archival of the research topic, an observational study, and a survey questionnaire of the applied case study. The research concludes its findings in the form of a theoretical framework indicating the needed qualities in Humanising commercial streets.

2. Social Sustainability and User Experience

There is a debate on the conception of social sustainability (Eizenberg, 2017). Many scholars linked social sustainability with its causing attributes, which are physical components and qualities of places' design and planning (Jabareen, 2006) and (Dempsey et al., 2011). Examples of those physical components and qualities are compactness, accessibility, diversity, and mixed-use, among others. Yet, social sustainability is very well connected and assessed through the user experience (Kramer, 2012). This research adopts the concept that user experience is not only an adding value to well-being but rather a tool for assessing the efficiency and quality of any design. In the context of this research, the social sustainability reflected in the interaction between a user and the surrounding built environment is known as the user experience, which can be visual, sensual, or physical.

2.1. User Experience

Public spaces are evolved by building a User Experience based on thorough exploration and attainment of individuals' needs and interests (Zare, 2017). Researchers suggest that the experience of a space is measured by a person's physiological comfort within it, their emotional changes during interaction, and how the surroundings stimulate their senses (Daly et al., 2016). Accordingly, it is broadly acknowledged that the User Experience is not entirely based on visual satisfaction but also on the performance, serviceability, and usability of the surrounding elements. A contradicting theory defines User Experience as a response toward a space's actual performance in comparison to the user's expectations (Ogembo, 2019). Ogembo explained that an expectation of the experience is generated before a person interacts with a space. Therefore, engagement with it can be influenced by backgrounds, past experiences, personal needs, or "promotional materials". Correspondingly, the author argues that the User Experience is non-quantifiable, hence, UX Design should be entirely based on demographic studies of users and essential needs.

2.2. Factors Affecting the User Experience

Elements composing the built environment of a Commercial Street can either enhance or damage the User Experience. However, as shown in Figure 1, those are not simply limited to Architectural features but also include social and functional elements.

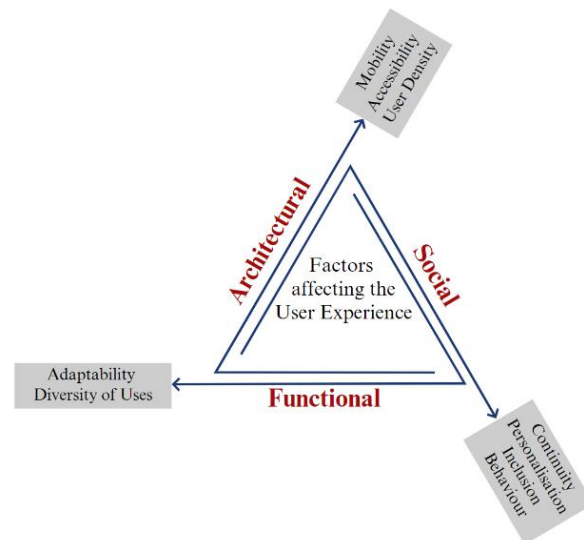


Figure 1. Factors Affecting the User Experience. (By Author)

3. Spatial Characteristics of Commercial Streets

Lanes, pavements, and streetscaping are the fundamental components forming all urban streets regardless of their variable dimensions and designs. Therefore, design principles are not limited to components and visual features, as defined by the International Design Foundation (IDF), yet they are “guidelines, biases and design considerations” implemented by Architects to properly arrange and design elements to produce a functional, efficient, and serviceable design. The design of various street elements should satisfy users’ needs. It should be inclusive for all ages, genders, and classes of users. Most of the research papers confirmed that the basic functions and principles of commercial streets should guide the physical features of street design.

The cruciality of designing Shopping Streets that sustain both vehicular and pedestrian mobility has been emphasized by Farahani et al. (2015) and Harb (2016) who have stated that commercial streets accommodate “intense interaction” between vehicles and pedestrians. Therefore, lanes for cars should be created according to standards to facilitate “enlightening journeys for the drivers or passengers”, nonetheless, a commodity of passages for pedestrians must be ensured to encourage on-foot movement and direct interrelation between all street segments and functions. Additionally, the presence of a common typology of commercial streets was identified as a linear organization of shops on the sides of central vehicular lanes (Farahani et al., 2015). The following layouts (figures 2 & 3) show the common linear typology found in different contexts. Other key features of shopping streets include visibility and accessibility of retail zones for various users throughout the entire street. Harb further stressed the significance of these features in increasing the functionality, attractiveness, and visibility of a commercial street, as well as facilitating movement and providing diverse users with positive experiences.



Figure 2. Linear Layout of South Commercial St. (Neighborhood planners, 2020)



Figure 3. Linear Layout of Commercial St. in Nevada (Rebecca Coffman, 2023)

The physical features of commercial streets should include environmental and climate protection through any method of shading, heating, or cooling and heat protection (Harb, 2016). A study summarised the identification of commercial or high streets through the features: density, sustainability, developmental, serviceable design, and a high-quality public space, in addition to the multiplicity of functions including “leisure, retail, entertainment and cultural facilities, business, office and other employment opportunities, public and private services, and residential opportunities” (GENECON, 2011), signifying that the variation of users, vehicle-pedestrian balance, accessibility and functionality are distinguished as key descriptors of Commercial Streets.

The diversity of functions within Commercial Streets is an inevitable response to the variety of users. The interrelation between users and uses is outlined in the Study “Vibrancy of Urban Commercial Streets”, which explains that the density of users impacts the quantity and types of functions, on the other hand, “land use mix and interaction between pedestrians and vehicular traffic” undeniably affect the presence of shoppers (Harb, 2016). Uses and activities in Retail Streets were grouped by Farahani et al. (2015) as either having a social or commercial identity, on the contrary, Fouad (2019) claimed that shopping streets, regardless of the nature and variation of activities conducted within them, have two main functions under which all activities are classified, “Accessible Link” or “Place” (Fouad, 2019). The concept of an Accessible Link is that the street is an integral part of the road network. Hence, they link different regions/zones of cities, sustain public transportation facilities, and allow pedestrians to easily travel from one point to another.

Following the literature and theories that feature a standard commercial street, the research categorizes common features and the qualities of shopping streets as tangibles, which are the physical elements of the street, and intangibles, which are perceptible qualities. Table 1 summarises the categories of those key qualities and their definitions, which must be achieved in any standard commercial streets designed inclusively to support various users and activities, besides, maintaining acceptable performance and quality. The research suggests a rating system for each component based on its importance. Used rating points are from 1 to 3, indicating “1” as average, “2” as important, and “3” as very important. The rating reference is the most common essential qualities in commercial streets as discussed and debated in the literature review.

Table 1. Features and qualities required in a standard commercial street design
(By author based on the literature review)

Features & Qualities	Description	Rating (1 – 3)		
Tangible	Accessibility	<ul style="list-style-type: none"> Facilitated entrances. Segregated pathways for various types of users 	3 3	
	Walkability	<ul style="list-style-type: none"> Designated lanes or sidewalks protected from vehicles 	3	
	Safety	<ul style="list-style-type: none"> Eliminating physical hazards Increasing a person’s interaction with the surroundings 	3 2	
	Diversity	<ul style="list-style-type: none"> Multiple uses and services offered 	2	
	Efficiency	<ul style="list-style-type: none"> Obstacle-free movement Linear street layout and organization of services 	3 2	
	Functionality	<ul style="list-style-type: none"> Practical organization and variation of services Ease of usage and access by users 	2 3	
	Comfort	<ul style="list-style-type: none"> Protection from climates and pollution Reduction of negative impacts on psychology Supporting users with physical challenges 	3 1 2	
	Attractivity	<ul style="list-style-type: none"> Visual appeal of the components, services, and activities 	1	
	Intangible	Liveability	<ul style="list-style-type: none"> Creating activities, attractions, and decorations 	1
		Sociability	<ul style="list-style-type: none"> Using spaces and activities that encourage communication 	1

Visibility	• Openness and comprehensiveness of organization of the components and features	1
Inclusion	• Services/uses equally usable and accessible for all users	3
Identity	• Features representing specific cultures or heritage	1

4. Humanisation

Understanding the theories of Humanisation highlights its cruciality for improving the quality of life and increasing the physical and psychological well-being of all citizens. Humanised spaces are created by eliminating certain challenges and introducing innovative strategies that solely focus on assisting citizens and supporting their lifestyles. The Humanisation of streets includes certain qualities, such as having an inclusive set of attributes that allow a safe environment for a diverse of human activities (Jacobs 1961) and (Almahmood et al., 2018).

Humanisation strategies are grouped into three main categories. The first category focuses on the social aspect, which has strategies that enhance the sociability, attractivity, inclusivity, and identity qualities of the commercial street. The technological category as a strategy applies technology to serve and assist the users and increase functionality, accessibility, and efficiency. Finally, spatial strategies focus on enhancing variable intangible and tangible qualities by adding or modifying physical features of the commercial street. In each category, two strategies are proposed, which are selected in accordance with their applicability and functionality.

4.1. Social Strategies

Applying social strategies to Humanise a public space is an implementation of the notion that social cohesion produces a mentally and physically healthy community. However, the noticeable lack of social interaction amongst citizens today can arguably be reversed by enforcing the involvement and engagement of diverse members of a community using common activities and events.

4.1.1. Public Arts and Cultural Festivals

One of the recommended approaches is implementing heritage and cultural aspects through public arts, festivals, or community activities to reconnect citizens and re-introduce the city's identity (Riazanova, 2020). In commercial streets, art, and cultural-based attractions "brand the high Street as a unique place" (GENECON, 2011), additionally, promoting a sense of connection between the user and the place which increases their comfort and, hence, enhances their experience (Jagannath, 2017). Furthermore, interactive public art can act as a form of communication between citizens by introducing a new common habit and a shared emotional bond that eventually strengthens social cohesion (Jagannath, 2017). Riazanova (2020) suggests that cultural festivals encourage "cultural development" as the prioritization of local aspects revitalizes communities more effectively than reshaping cities. Furthermore, cultural festivals provide authenticity to public spaces and boost social sustainability (Riazanova, 2020).

4.1.2. Age-friendly Public Spaces.

Since communities consist of members from various age ranges, many scholars proposed the strategy of creating age-friendly environments as a social approach to making public spaces more Humanised. Supporting elder members of a society undeniably enhances the overall well-being of a community by limiting social exclusion (Hassen & Kaufman, 2016). Age-friendliness in public spaces can be accomplished by applying physical features, such as sidewalk supports, "traffic calming features", and better accessibility to areas and transportation facilities (Hassen & Kaufman, 2016), however, it is also an issue of social connectedness. Lak et al. (2019) mentioned 4 key steps to approaching an age-friendly space: understanding their needs for inclusion in space design, motivating their interaction with social and civic activities, improving independence among older people with disabilities, and supporting their emotional and psychological wellness. Creation of public spaces particularly dedicated to elder citizens to demote

their sense of communal isolation (Hassen & Kaufman, 2016), as well as, integrating additional services within public space design in response to their medical limitations in addition to conducting activities and events to promote social interaction (Lak et al., 2019), are some of the recommended applications of age-friendliness in public spaces.

4.2. *Technological Strategies*

As Humanisation is the incentive to reverse the impacts of technological dominance, it may seem contradictory to use technological strategies to Humanise a public space. However, proper implementation of technology may be advantageous to citizens, and can evidently increase the safety, serviceability, and accessibility of urban space, thus making it more human-friendly. Technological strategies are used on a large scale in cities to evolve them into Smart Cities, such as Barcelona and London, however, some strategies can be applied to develop a single space like a commercial street.

4.2.1. *Assistive Technology*

One of the key challenges of Street design is accessibility. Fortunately, the physical limitations caused by disabilities can be reduced by the application of Assistive Technology (AT), which is used to replace the impaired sense or motor function of an individual, for instance, visual impairment prevents a citizen from utilizing a commercial street due to the challenges they would face, especially mobility (Huang et al., 2022). An interactive traffic system that consists of a series of kindred elements can be applied in High Streets to provide auditory guidance to facilitate the navigation of visually impaired users (VIU) by increasing their awareness of their surroundings (Huang et al., 2022). Traffic control authorities have applied “Beeping traffic lights”, which produce sounds to inform VIU when to walk or stop, furthermore, they created “talking bus stops” that dictate bus numbers, routes, and station names to simplify wayfinding (Carole, 2022). Other ATs discovered through the literature review include voice-activated maps, ultrasound sensors on Street fixtures that produce alerts for pedestrians if they are about to collide, as well as smart barriers that rise to prevent pedestrian movement into traffic (Yilmaz, 2018), (Huang et al., 2022) and (Carole, 2022).

4.2.2. *Internet of Things (IoT)*

The Internet of Things strategy was majorly implemented on an international scale in parallel with the growth of the Smart City concept and modern technological advancements in the early 21st century. The principal use of IoT is connecting sensors and computing devices to the internet and transferring collected data among them. This “machine-to-machine” connection provides information for responsible personnel and officials to respond appropriately to the issues reported by the IoT devices (Grebaw, 2018). The IoT network consists of “smart sensors, monitoring devices, AI programs, and actuators that can evaluate, monitor, and control certain aspects of city life” (Appleton, 2021). Applications of IoT strategies in public spaces are various and rapidly developing, through research, a selection criterion has been established to distinguish the applications which can be serviceable to commercial streets:

- Not reliant on Smartphones. A strategy that requires the use of a Smartphone is impractical as not all users always have access to Smartphones or the Internet.
- Does not need additional infrastructure which may be costly or inapplicable.

The selected IoT strategies have been summarised in the following table, with a noting of recommended adjustments that supposedly make them more adaptive and suitable for the final guidelines of a Humanised Commercial Street.

Table 2. Applications of IoT in Public Spaces (By author based on the literature review)

Strategy	Function	Benefit
Air Quality Monitoring (<i>Insider Intelligence, 2022</i>)	Smart sensors detect the air quality, including the presence of contaminants, harmful chemicals, or infectious bacteria, to prompt outdoor air purifying devices.	Creates a healthy environment for users and helps reduce the spread of diseases.
Video Surveillance (<i>Appleton, 2021</i>) (<i>Insider Intelligence, 2022</i>)	Examples: Automatic License Plate Recognition and Automatic Facial Recognition, a technology used for identifying stolen cars, citizens with criminal records, traffic rule-breaking (e.g. over-speeding), and accidents to instantly send alerts to quick response teams and authorities. Advanced surveillance cameras use Artificial Intelligence to predict accidents and crime occurrence by assessing factors such as body language etc.	Reducing crime/accident rates and increasing the overall safety of the Street. Additionally, eliminates possible causes of hazards.
Smart Parking (<i>Stefanini, 2017</i>)	Sensors placed in parking spaces can notify the vehicle users whether a parking space is vacant or occupied. Recommendation: The sensors could target bulbs that light to inform users instead of relying on Smartphones	Helps reduce traffic congestion and assist vehicle users.
Smart/Connected Public Transport (<i>Appleton, 2021</i>)	Sensors in waiting areas/benches that detect when a citizen is waiting for transportation and notify drivers. Recommendation: Monitors dictating the location and the estimated arrival time of the nearest public transport and type. Can contain calling buttons as well used by citizens to call drivers to their locations.	Facilitates the use of public transport, controls traffic congestion, and helps citizens navigate easily.
Facility Monitoring (<i>Chang, 2022</i>)	Applied sensors that detect and report defects in the Street's facilities such as manhole coverings, non-working lights, broken fixtures, etc.	Sustaining the quality of the built environment and encouraging fast maintenance.
Weather Monitoring (<i>Appleton, 2021</i>)	Sensors collect data about the weather conditions and predicting changes. Recommendation: Prompt responses by objects such as smart shading devices, smart lighting, ventilation, or heating systems.	Overall enhancement of the built environment and protecting users from changing climates.

4.3. Spatial and Physical Strategies

Architectural approaches are numerous therefore selection of methods was based on two dimensions; their level of innovation and the extent to which they benefit the users. The literature review presented ways to make a public space design more human-centred, and additionally, considerate of members with disabilities. Furthermore, it introduced advanced Architectural concepts and elements that distinctly enhance the user experience.

4.3.1. Human-centered Layout

A human-centred design motivates walkability by creating a Street typology that grants pedestrians more dominance over vehicles. Pedestrian Streets can be suitable for the function of commerce, however, eliminating the access of vehicles prevents the Street from being used as a link or connector between regions. This is impractical in high Streets located in central or vital areas of cities (Hawaii Department of Transportation, 2013). Thus, the most common Commercial Streets are called “Commercial shared Streets”, which means that they support a pedestrian-vehicle relationship. Frequently, a shared high Street has central lanes dedicated to cars and 2 sidewalks with varying widths for pedestrian mobility (Global Designing Cities Initiative, 2017).

A key feature of human-centred Street design is enlarging the sidewalk width to provide more spaces to pedestrians rather than vehicles, which instantly prioritizes humans in the Street space (Making Montreal, 2023), as witnessed in the transformation of Montreal Streets (Figure 4).

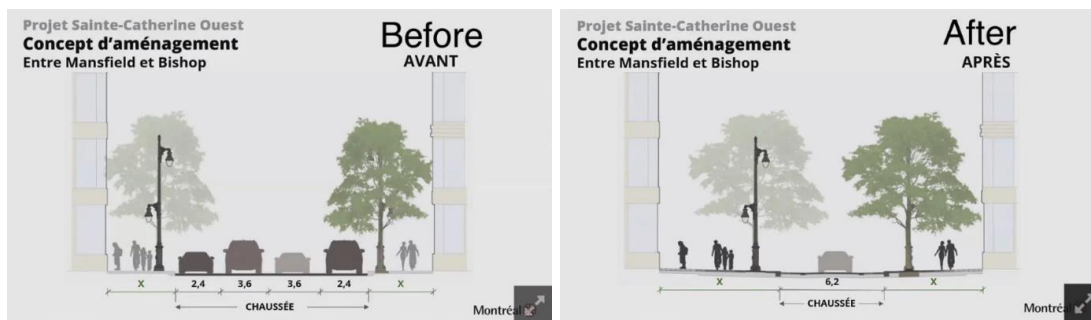






Figure 4. Project Sainte-Catherine: The Streets of Montreal (Making Montreal, 2023)

Other innovative layouts have been seen in Las Ramblas, one of the most human-friendly Commercial Streets in the world. Las Ramblas reversed the regular Street layout, dedicated the main central space for pedestrians and shoppers, and used side lanes for vehicles to maximize walkability (Figure 21). Human-centred layouts can have various forms depending on the Street’s dimensions, nonetheless, they must also include physical elements such as buffer zones and barriers to increase the safety and walkability of the users (Hawaii Department of Transportation, 2013).

4.3.2. Weather Protection

Climate change is reflected through severe weather conditions including relentless heat during summers and intense winters accompanied by rainstorms and powerful winds. Conditions which undoubtedly constrain the functionality and performance of commercial streets. Accordingly, weather protection techniques must be applied to protect users and permit the utilization of a commercial street regardless of the weather (Moreland et al., n.d.). Protection features should be selected based on a study of the climate at the street’s location. Extreme weather conditions may discourage walking, such as sunlight, heat, wind, and rain (Eady, 1990). Hence, increasing the walkability, livability, and numerous other qualities of a commercial street are impacted by the environment. A variety of weather protection elements were discovered through real-life examples and research, the following table summarizes strategies with considerably easy application and high novelty, as well as the locations where they have been applied.

Table 3. Applications of Weather Protection in Public Spaces (By author based on literature review)

	High Street, Doha, Qatar	Souq Waqif, Doha, Qatar	Callé Marques, Malaga, Spain	Sapporo, Japan	Metzgergasse, Buchs, Switzerland
Examples					
Weather Condition	Extreme heat	Extreme heat	Sunlight	Cold weather and snow	Rain and wind
Protection Elements	Outdoor air conditioning	Blue Asphalt	Fixed canopies and shading devices	Heated sidewalks	Membrane roofing (convertible or retractable)
Application	Vents in sidewalks provide cooled air.	Blue asphalt which reflects heat, unlike black asphalt.	Narrow Street width so canopies were fixed between buildings	Hot water circulating in the pavement to heat and melt snow	Automatic textile canopy: full covering in 5 minutes, or partial (as required)

5. Humanising Commercial Streets

Identifying a Humanised commercial street is accomplished by “assessing the quality of architectural space in terms of Humanisation” (Pellitteri et al., 2014), this is based on the efficiency of fulfilling the needs and requirements of various users, as well as the performance of the space during usage. Alabed et al. (2021) debated that for a commercial street to be considered Humanised, it must display and maintain the following possible qualities: Safe and friendly, healthy and liveable, socially encouraging, landscaping, heritage/historic value, and “.. a place to learn and play”.

In agreement, Persson et al. (2014) described a Humanised High Street as “accessible, walkable, safe, delightful, comfortable, liveable, inclusive, and sociable”. Scholars also provided a variant list of parameters identifying the Humanisation of spaces which can be grouped as design aspects and design elements. Those include:

1. Design Aspects: human-scaling, walkability, functional diversity, clarity, and application of micro-climates.
2. Design Elements: resting spaces and tree canopies.

Humanisation targets dominating pedestrians and increasing the quality of life, while other streets continue to prioritize vehicles. The most crucial function of human-based commercial streets accordingly is stimulating “healthy travel” (Choi et al., 2015), which may be accomplished by advanced streetscaping as suggested by GENECON LLP and Partners. In contradiction, Almahmood et al. (2018) recommend that human-friendly public spaces share universal qualities classified as spatial and socio-spatial. The literature review presented numerous theories and physical features associated with the identification of Humanised commercial streets, despite the data showing a variation in the categorization of parameters based on authors’ theories and points of view, commonality can be perceived amongst the features. The overlap and divergence indicate that the definition of Humanisation is a matter of perspective, that the theory is driven by user experiences and needs, additionally, that there is a presence of gaps in the global understanding of Humanisation.

Evidently, Humanisation may be considered an implementation of the Inclusive Design Strategy (Persson et al., 2014) and (Almahmood et al., 2018), as the main aim of this approach is establishing a public space that can be utilized by all citizens equivalently (Alabed et al., 2021). Furthermore, Alabed et al. claim that human-based environments should encourage interaction with components to stimulate psychological and physical wellness. Nonetheless, research argues that the Humanisation of a commercial street should implement different strategies from other urban streets in High Streets. In this context, Persson et al. (2014) provided an overview of a presumably ideal user experience within a Humanised environment. The authors highlighted the “Ability of people to access and use space regardless of their age, gender, class, ethnicity, or religion” as an essential attribute that promotes their sense of safety and increases the liveability of commercial streets (Persson et al., 2014).

Furthermore, Almahmood et al. (2018) stated that a human-friendly environment ensures an advantageous user experience that encourages involvement in activities such as walking, socializing, leisure, and occupational. Other studies provided recommendations for modifications to the built environment of a commercial street that would enhance the user experience. For example, a study of “traffic calming techniques” in urban streets showed their positive impact on foot traffic volume (Alabed et al., 2021). Another suggestion was implementing “public art and cultural attractions” to provide users with a sense of place and develop a connection between them and the surrounding environment to further improve their welfare (GENECON, 2011).

6. Commercial Streets in Egypt

Commercial streets have a long history in Egypt. They are an essential component of its urban fabric, stating its culture and economy. The origin of the current Cairo was the Kasabah of Cairo, which is a commercial street, currently Al Moez Street in Cairo. Commercial streets in Cairo are many, located in various districts and centres. Due to substandard planning and construction, inhospitable landscaping, and excessive visual pollution, many commercial streets in Cairo are massively suffering from dehumanisation symptoms. Many scholars suggested various solutions to the current situation of streets in general, such as car-free streets (Doheim et al., 2020), or enhancing their physical attributes (Elkhashab, 2022). Thus, this research investigates the causes, symptoms, and possible enhancement solutions in its selected case study.

7. Case Study: Othman Ibn Affan Street, Heliopolis, Cairo

Othman Ibn Affan Street (OIAS) is a popular commercial street located in Heliopolis, Cairo. The selected segment of the street extends from the Basilique Cathedral to Al-Ismailia Square with a total length of approximately 1 km as shown in figure 5. The selected segment has a mix of commercial types, such as commercial shops of various products, supermarkets, cafes and restaurants, co-working spaces, and pharmacies, among others. Figure 6 shows the current state and layout of the Street. The Street has a narrow median (approx. 40 cm) and sidewalks varying in size from 1.2 m to 4 m. Heights of the buildings vary from 2 to a maximum of 11 floors with the ground floors housing the stores and the higher floors used for apartments, clinics, or businesses.



Figure 5. The selected segment of OIAS understudy
(Source: Google Maps)

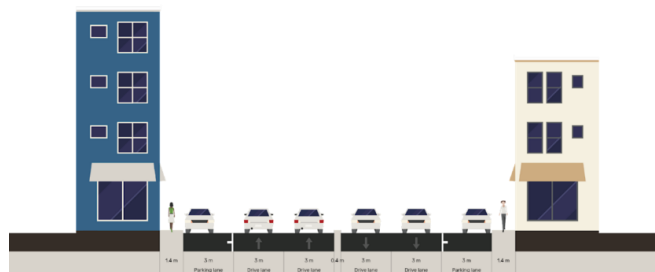


Figure 6. A cross-section in OIAS shows its status.
(By the author)

7.1. Selection Criteria

A set of preferences was distinguished as the criteria for selecting Othman Ibn Affan Street as the empirical case study. Those criteria vary between street’s location, value, diversity of its included commercial functions, and its popularity. The selection criteria are clarified as follows:








Table 4. Case study selection criteria

Criteria	Description	Advantages
Location	The street must be located in a lively, proximal, and easily accessed region of Cairo	<ul style="list-style-type: none"> Finding a diverse and large group of users and survey participants Ability to visit frequently to complete the data collection
Value	The street must be considerably old, having either a historical or cultural value	<ul style="list-style-type: none"> Emphasises the significance of the case study. Allows completion of the Archival Study if the Street was part of a particular historical period
Recognition	The street can be commercial and residential, but it has to be locally recognized as a commercial street	
Functions	Must accommodate diverse functions including social, leisure, occupational, etc.	<ul style="list-style-type: none"> Better evaluation of its performance as different types of user interactions are explored. The Street will have a high density of users. Larger variation of survey subjects

7.2. The Observational Study of Othman Ibn Affan Street








The following tables assess and explain the fulfilment rate of street qualities in Othman Ibn Affan Street based on the observational study. While Table 6 illustrates the observational study of the street’s tangible qualities, Table 7 illustrates the assessment of its intangible ones. Each quality is rated from 0-3 (0: Not fulfilled, 1: Poorly, 2: Fairly, 3: Very Well).

Table 5. Fulfilment of tangible qualities in OIA street (Observation Study: By Author)

Tangible Quality	Accessibility	Walkability	Safety	Diversity	Efficiency	Functionality	Comfort
Fulfilment Feature	0	1	1	2	1	1	0
							
Observation Positive		The sidewalk is on a separate level from vehicles.	The sidewalk is on a separate level from vehicles.	Multiple uses and services.	Linear organization	Linear organization	

Negative	No ramps or pathways for disabled people. Existing ramps are unusable.	Steps along the sidewalk reduce walkability.	No buffer zone/barrier, or pedestrian crossings.	Poor organization	Sidewalks are full of obstacles.	No separate lanes	No landscape, seating areas, or shading devices
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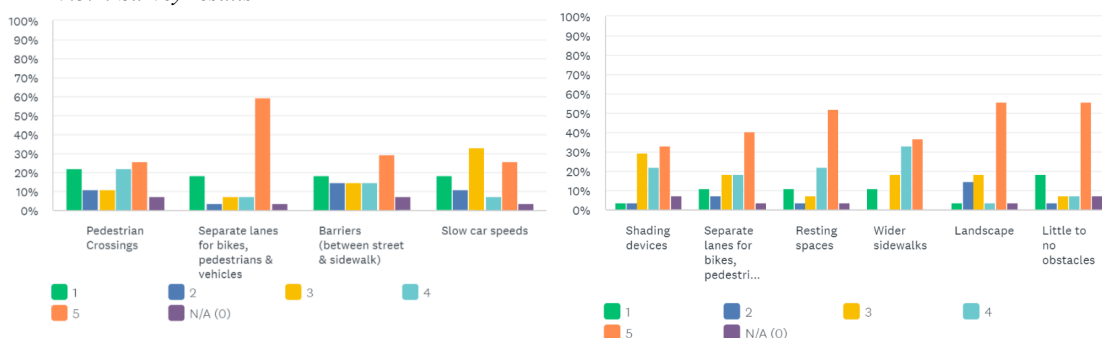
Table 7. Fulfilment of intangible qualities in OIA street (Observation Study: By Author)

Intangible Quality	Attractivity	Liveability	Sociability	Visibility	Inclusion	Identity	
Fulfilment	0	0	1	0	0	2	
Feature							
Observation							
Positive			Dining areas and cafes.			Remaining of historical architectural style.	
Negative	No landscape, decorations, or proper lighting	The street is not encouraging for pedestrians	No seating areas or open spaces.	Countless obstacles and poor lighting. Visual pollution.	No places are designated for kids or seniors.	New buildings have no distinct style. Privatization ruins the image.	

7.3. Case Study Survey

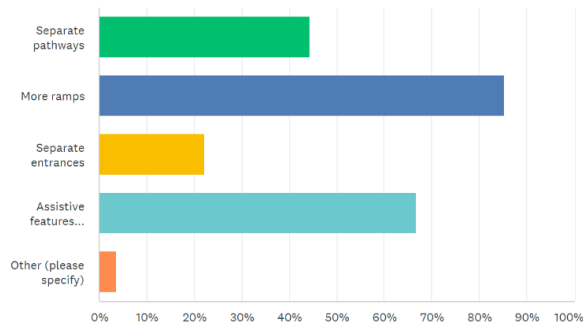
The objective of the survey is to evaluate the users' perception of the street's qualities and features to understand which ones negatively/positively impact their experience. In addition, to identify their needs and expectations from the street. The survey sampling reached 50 participants from different age groups. It was divided into 4 sections to assess street qualities using yes/no rating, and multiple-choice questions.

7.3.1. Survey results



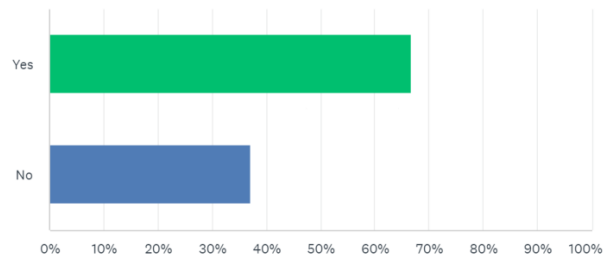
Question 1: Rate the elements according to how each improves your safety (1 lowest to 5 highest)
 Results collected through this question show that the elements users believe most impact their safety are **Separate lanes for bikes, pedestrians & vehicles, and Barriers (between Street & sidewalk)**.

Question 2: Rate the elements according to how each would improve your experience (1 lowest to 5 highest)
 Results collected through this question show that the elements users believe can improve their experience are having **resting spaces, Landscape and Little to no obstacles**.



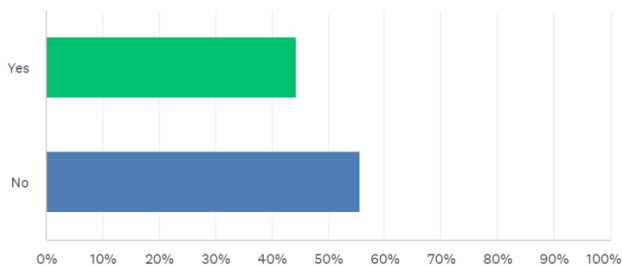
Question 3: How can the Street be better for people with disabilities?

Results collected through this question show that the features users predict may improve the accessibility of people with disabilities are having **More ramps and Assistive features.**



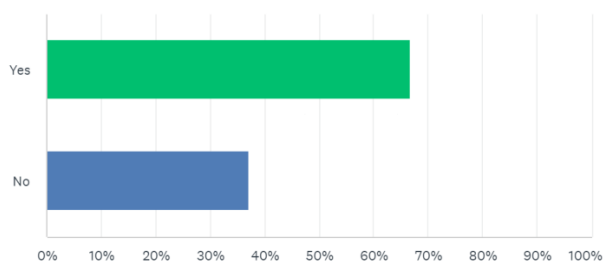
Question 4.1: Can you easily find/access the services you need?

Yes, or no? Most users agreed that they can easily find/access needed services, and 12 participants voted “no”, as they believe that there are no proper guiding elements such as signages or maps to facilitate mobility.



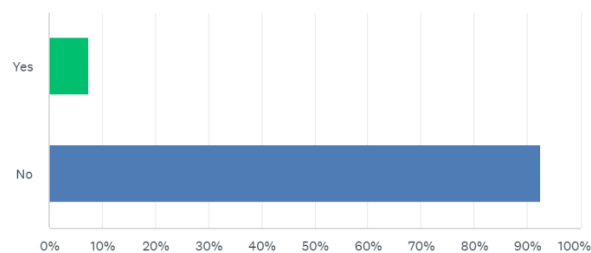
Question 4.2: Do you think the Street is too crowded given the space? Yes, or no?

This question addresses the density of pedestrian and vehicle users vs the space. 24 users agreed that the environment is too crowded by the number of vehicles present or parked in the Street.



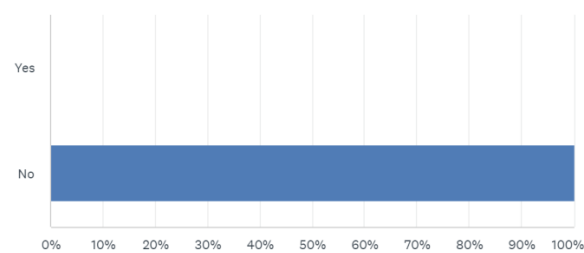
Question 4.3: Would you prefer leisure and commerce areas to be separated?

Only 20 users voted “no” discussing that segregation of uses can reduce the attractiveness and liveability of the Street and 66.67% voted yes as they believed that it increases the efficiency of the Street and improves their experience as the space would not be crowded by “strolling users”.



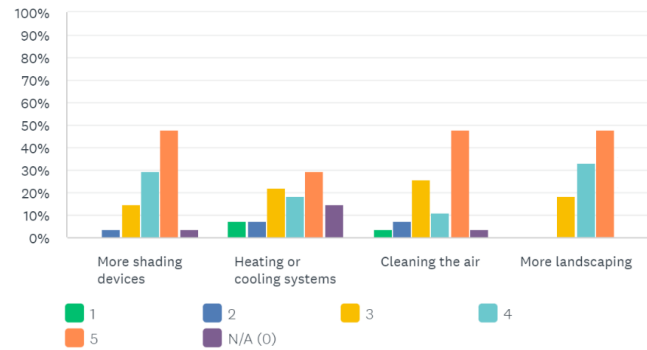
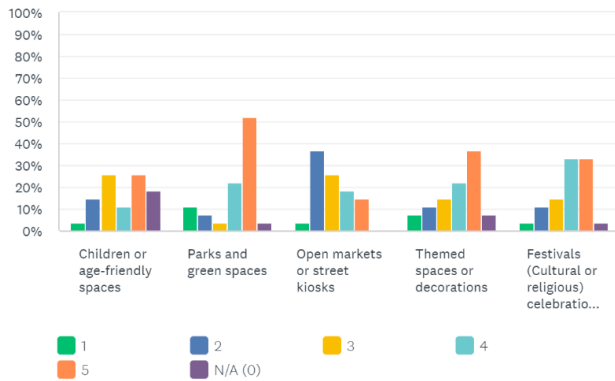
Question 5.1: Do you think the Street is suitable for all age groups?

50 out of 54 participants agreed that the Street is not suitable for all age groups, most of them claiming that the Street lacks features such as seating areas for the elderly or public (green) spaces for children. Furthermore, the Street was considered unsafe for children due to vehicle congestion and has low walkability for the elderly.



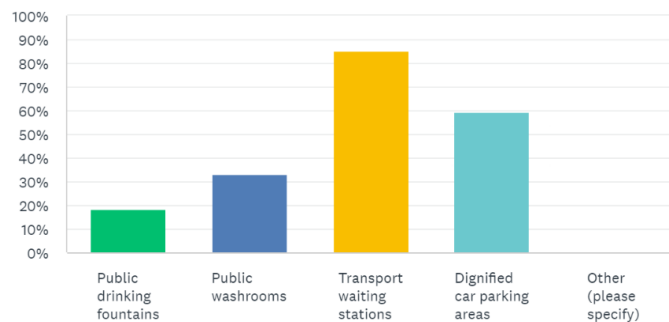
Question 6.1: Are there enough seating/resting areas? Yes, or no?

All survey participants have agreed that there aren’t enough seating areas in the Street, therefore, a crucial modification to OIA is increasing the number of seating areas and creating a variation of them to increase the comfort of the users and enhance the Street’s amenities.



Question 5.2: Rate the elements according to how they impact the attractiveness (1 lowest to 5 highest)
 Results collected through this question show that the elements users believe can increase the attractiveness of the Street are **Parks and green spaces, Themed spaces or decorations and Festivals (Cultural or religious) celebrations/decorations.**

Question 6.2: Rate the elements according to how they would impact the level of comfort (1 lowest to 5 highest)
 Results collected through this question show that the elements users believe have an impact on comfort are adding **shading devices, Cleaning the air and having More landscaping.**



Question 6.3: What features would you like to see/use here?
 85.19% chose having transport waiting stations. The second highest voting was for having dignified car parking spaces, due to the vehicle congestion and dominance over pedestrians. Public drinking fountains and washrooms were not frequently chosen because there are numerous dining areas and cafes which users can easily access and use.

8. Discussion

The data provided guide the needs of the street users and the challenges they encounter during their interaction. Firstly, the observational study emphasized the limitations and constraints that degrade the built environment and negatively impact the user experience. The survey section highlighted the architectural elements and characteristics required to improve the tangible qualities of the street as well as enhance the user experience. Conclusively, the findings of both sections will be resolved in the suggested theoretical model. Findings are summarised as follows:

1. According to the initial assessment of qualities and features, the street does not fulfil the standard requirements of commercial streets, therefore, the first modifications must be adding features to satisfy the standard requirements.
2. The key problems discovered from the observational study include poor waste management, the presence of multiple hazards, a lack of resting spaces, poor space management, and privatization of public amenities of the street.
3. Low fulfilment rate of both tangible and intangible qualities, specifically comfort, safety, inclusion, accessibility, functionality, efficiency, and diversity.
4. Inadequate public amenities provide a negative experience.

9. A Theoretical Model for Humanising Commercial Streets in Egypt

The research concludes the theory, which is gained from the literature review, and merging it with the practice that is gained through analyses of several examples, and the research main case study with creating the following theoretical model. It shows how each ‘*Humanisation*’ strategy enhances certain qualities of commercial streets.

The illustrated core of the model shows the standard tangible and intangible street qualities, while the outer 6 layers represented in the model key that indicate the humanisation strategies ordered by applicability from simplest (layer 1), which refers to the ‘Age-friendly spaces’ strategy, to most advanced (layer 6) that is related to the ‘Internet of Things/IOT’ strategy. The model indicates how each layer of Humanisation enhances (or not) each standard quality of the street and makes it more Humanised. This is represented through the illustrated shading that don’t exist when there is no impact/no relation on enhancing certain quality of the street by a certain strategy.

By creating this theoretical model, the research proofs that a combination of more than a humanization strategy is needed to comprehensively enhance commercial streets and make it more humanized.

Application difficulty	Simplest			Most Advanced		
Strategy type	Social	Social	Spatial	Technological	Spatial	Technological
Strategy	Age-friendly spaces	Public arts & Cultural Festivals	Weather Protection	Assistive Technology	Human-Centred Layout	Internet of Things
Layer number	1	2	3	4	5	6

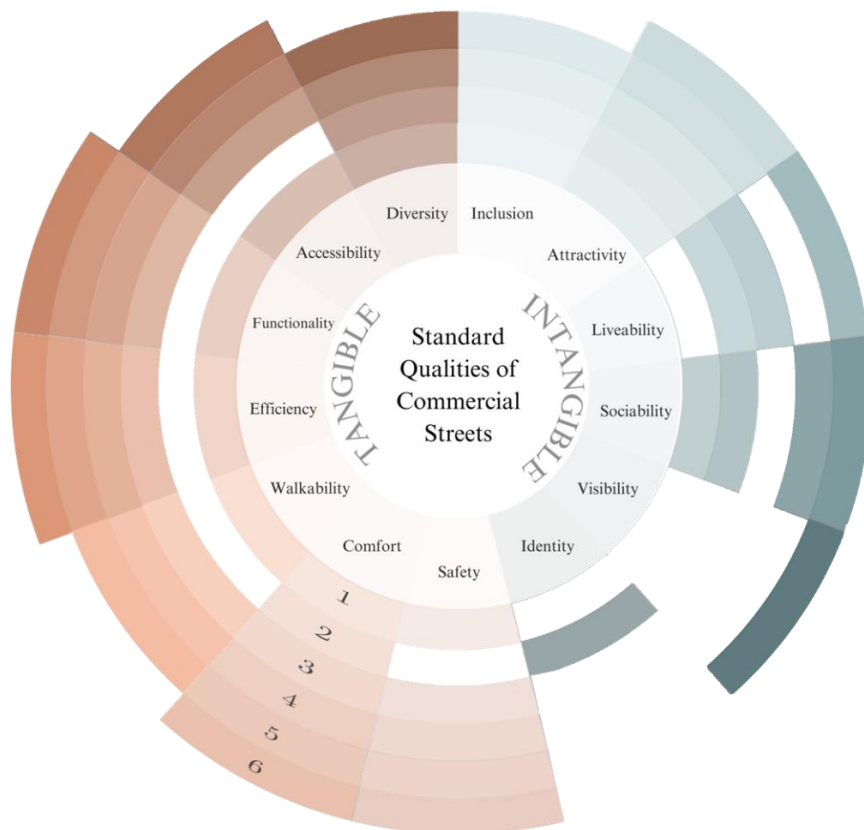


Figure 7. A Theoretical Model for Humanising Commercial Streets in Egypt (By the author)

10. Conclusion

The research focused on developing a model for Humanising commercial streets in the Egyptian context. It analyzed, classified, and exploited the needed qualities of any street as tangible and intangible ones. The research proposed a rating system that can be utilized to assess the quality of commercial streets.

The research linked the theory with practice as it selected Othman Ibn Affan Street in the Heliopolis district as a case study based on certain criteria. It undertook field research illustrated in a critical observational study to assess the current situation of the street. It carried out an inclusive survey questionnaire to assess the users' needs in the named street. The research employed the three common Humanisation strategies, namely social, technological, and spatial strategies, as a combined model to develop/transform commercial streets into Humanised ones.

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