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Walaa Walaa Noor, Marwa Kamar

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The Role of Human Needs in Urban Renewal and Development of Urban Spaces for City Centers

Elham Fettouh El-Dmerdash, Walaa Ahmed Nour, Marwa Kamar Al-Dawla

Department of Architecture, Faculty of Engineering - Tanta University

Abstract: Urban space is a complex and multifunctional mechanism that people move like cogwheels. When the movement slows, mechanism stops and places become abandoned and dead. Public space is the vital part in this mechanism, including everything that surrounds us: paths that we pass everyday on the way to work or school, parks that we use for leisure and interaction with nature, squares and other meeting points where we gather to socialize, as well as quiet places to seclude from the rush. All of these elements are very important in daily urban life. I believe the quality of urban life is very closely connected to the presence and quality of public space, where people feel the bond with the city and its people. In other words, it is like an ancient Greek Agora. Human needs are regarded as one of the most important factors that governs the designing of urban spaces, especially in city centers, in order to fulfill the immediate needs of the inhabitants of such spaces, such as security and safety, visual comfort, thermal comfort, etc. However, the attention dedicated to human needs in the designing of urban spaces is quite limited in relation to the other design aspects, despite their great importance in creating a successful urban space.

In this regard, this paper conducts a study of city centers and the stages of their historical development over the ages, indicating the causes that led to these developments. Subsequently, the paper conductus a thorough investigation of urban spaces in terms of their definition, importance, classification, components, and characteristics, in order to deduce the conditions governing the success of these spaces. Afterwards, the paper investigates the behavior and needs of individuals and inhabitants within such urban spaces. Finally, the paper concludes the mutual relationship between the components of the urban space and the fulfillment of the needs of the inhabitants of such urban spaces in city centers. The paper also determines the extent to which urban spaces impact on the behavior of individuals and inhabitants. And then applying that study to the center of Abu Dhabi city, as it is one of the best Arab cities that cares about the human needs of users and applying it to Egyptian cities in future research.

Keywords: City Centers, Urban Spaces, Human Behavior, Human Needs

I. INTRODUCTION

City centers are the beating heart and the main lifeline of any city. They also reflect the extent of a city's distinction by playing a significant role in the achievement of the goals and desires of society due to the fact that the economic, social, and political activities are concentrated in such centers. They are simply at the center of any and every business and financial transaction.

Research problem

The majority of urban designing and planning processes for new city centers, as well as those related to the upgrading

of existing urban spaces and spaces in old city centers, focus on the physical aspect, embodied in addressing and improving the built environment, with little attention dedicated to the human aspect. This is due to the predominant concern towards the physical and economic aspects, neglecting the social and human aspects in the process. This neglecting results in marginalizing the needs of the inhabitants of these urban spaces, which negatively affects their behavior towards such spaces, accompanied by a negative attitude towards the built environment, rendering it insufficient and unfulfilling of the goals and functions required of it. Therefore, there is a need to study the human needs of individuals within the urban spaces, in order to take them into consideration while designing and developing these spaces so that they would fulfill the needs of its inhabitants and attain all the elements that render an urban space successful and fulfilling of the function for which it is designed.

Objectives

With this thesis, I intend to explore the topic of human needs in urban space in city centers, with this investigation, I want to answer this main question: How can the quality of urban space be improved?

Methodology

In this research, in order to gain necessary information and data, methods like observation, discussion with users and data analysis were used. These methods have been useful to collect and search both primary and secondary data of the research. The observation was conducted as a pilot survey on a selected park to gain the information how urban users interacts with nature in urban spaces. The survey included the visitors of the park. This survey was conducted in a face-to-face manner which was very important for getting instant feedback from the participants.

The City (1)

The city is expressive of the history of every stage in urban life. It is considered to be a living being, as defined by Le Corbusier. The city is its inhabitants and means of transportation. It is the cradle of trade, economy, art, human emotions, government, politics, culture, and decorum. It is also the purest manifestation of the culture of its peoples and the development of its nations. It portrays a picture of man's struggle, his triumphs, and his defeats, making it a picture of strength, poverty, deprivation, or weakness.

City Center (2)

A city center is very significant in societies and nations,

as it is long considered to be the dynamo pushing cities forward economically. It is also the center of administration and business, embracing the culture of the city as a whole. There is not much difference between the meanings of the central business district (CBD) and downtown, which represents the center of urban life.

The historical development of city center designing and Planning (3)

The historical development of the patterns and shapes of city centers is divided into 4 stages, as follows (Figure 1)

- Early Urbanism
- Early Modern Urbanism
- Postmodern Urbanism
- Informational Urbanism
- After investigating the stages of historical development of city centers, the paper concludes that the main reason for the developments and changes in urban city centers is the human needs of the population, manifested in the emergence of new needs that did not exist before, especially after the industrial revolution. This is combined with the tendency to achieve abundance instead of merely meeting the basic needs. In addition, the technological development and the advent of the internet have led to the emergence of new needs for the population as a result of the cultural and knowledge exchange of the world's population.

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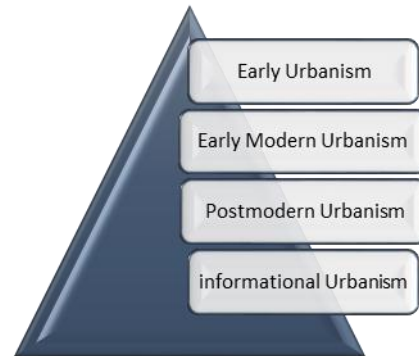
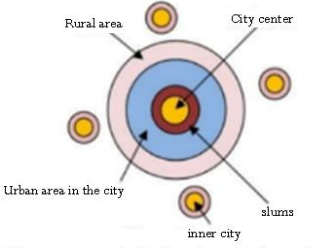
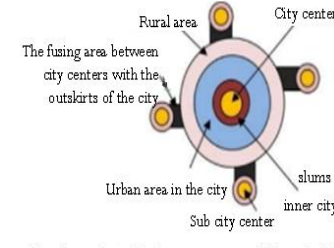


Figure 1: The historical development of the patterns and shapes of city Centers (3)

A comparison of the stages of the historical development of city centers over the ages and the main components of the city center in each stage is thus conducted:

Stages of historical development of city centers	Analytical description of the stage of development of city centers	Main components of city centers in each stage	Illustration corresponding to the stages of development of city centers
<p>Early Urbanism</p> <p>The period from Mesopotamia to the Middle Ages</p>	<p>At that stage, the city center was in downtown. There was no significant change in the structural composition of the city. The activity centers, represented in the religious, cultural, and other centers that are located in the city center area, are generally predetermined by the ruler during the planning of the city. Examples of these city centers include ziggurats in Mesopotamia, tombs in ancient Egyptian architecture, the agora in the ancient Greek city, the forum in the ancient Roman city, the medieval church, and the mosque in Islamic cities. (Figure 2)</p>	<ul style="list-style-type: none"> - Governor's Palace - religious buildings - Commercial market - public squares 	<p>Pre-modern urban city centers</p> <p>Figure 2 source : (3)</p>
<p>Early Modern Urbanism</p> <p>The period from the Middle Ages and the Industrial Revolution until 1950 AD</p>	<p>At this stage, a major change occurred in the city centers as a result of the industrial revolution and the rural to urban migration of large numbers of inhabitants, seeking employment opportunities in the field of industry in the center and heart of the city. This led to the emergence of slums, which are urban deteriorated areas in which workers and employees who migrated from the countryside to the city to work in industry live, and this area surrounded the urban city center. (Figure 3)</p>	<ul style="list-style-type: none"> - Political leadership and seat of government - Crafts and professions Stores - Factories - Shops - Residential buildings - Hotels 	<p>Urban city centers in the early modern period</p> <p>Figure 3 source : (3)</p>

<p>Postmodern Urbanism</p> <p>The period after World War II to the end of the twentieth century</p>	<p>Due to the availability of public transportation and the possibility of commuting to workplaces with ease, the residential use of lands in the city center has lessened. As a result, residential areas began to appear on the outskirts of the city far from the center, especially after the increase in private car ownership. The city center became exclusive on commercial and recreational services and political administration, then the central business areas appeared. Factories, small shops, and some recreational services began to move away from the city center towards the outskirts of the city. (Figure 4)</p>	<p>The main city center includes:</p> <ul style="list-style-type: none"> - political administration - Religious buildings - government buildings - Recreational activities and urban spaces - High-end shops - Business centers (companies - banks - offices) - Private parking lots and public transportation <p>The sub centers include:</p> <ul style="list-style-type: none"> - Crafts and professions Stores - Factories - Several small shops 	 <p>The emergence of sub city centers complementary to the main city center – Postmodern Urbanism</p> <p>Figure 4 source : (3)</p>
<p>Informational Urbanism</p> <p>The period from the end of the twentieth century until the present time</p>	<p>As a result of the rapid development in the means of communication and the expansion in the use of Internet networks worldwide, a major change has occurred in the largest cities around the world. This change is seen in the expansion and growth of these cities, which led to the intertwining and integration of secondary urban centers with the outskirts of the city. This has resulted in the reduction of congestion and of the burden on the main center. Motivated by the availability of larger spaces of land and waiting areas, some business centers have moved outside the city center and settled in secondary centers in search of a better environment for investment. As a result of the technological development and the use of modern construction techniques, large mixed-use commercial centers have emerged. They are among the most significant factors affecting the city center at this stage, due to their requirement of large areas of land and abundant funding. In addition, Multi-Department Stores have also appeared in the city center. (Figure 5)</p>	<p>The main city center includes:</p> <ul style="list-style-type: none"> - Large multi-floor commercial centers (malls) - Recreational activities and urban areas - Administrative offices and multi-story, high-rise public buildings - Government buildings - Hotels <p>The sub centers include:</p> <ul style="list-style-type: none"> - Factories - Crafts and professions Stores - Malls - Many business centers (companies - banks - offices) 	 <p>The formation of urban areas around the sub city centers resulted in a fusion with the outskirts of the city – Informational Urbanism</p> <p>Figure 5 source : (3)</p>

II. URBAN SPACES

A. Definition (4)

It is the space that three-dimensionally contains not only the people, but also their things and activities. It is also characterized with constant development over time. This development can be either urban development or human development, which entails human behavior, activities, movement, and everything related to human behavior.

Urban spaces are the built or non-built spaces that exist between buildings in the city, and each space has a unique use and a distinctive character. Hence, each space has a number of elements, including its shape, size, dimensions, color, texture that allow it to function for which it is designed.

Hence, urban spaces can be generally defined as one of the components of the urban fabric of the city. Urban spaces include every space between the buildings in the city, and they can be considered as a mirror that reflects life in the city, as they accommodate a large number of people and the activities they do. In addition, each space has certain functions and features that distinguish it from others.

Classification of urban spaces in cities (1)

Urban spaces in cities can be classified into two main categories:

- **Natural spaces:** they are spaces that are formed as a result of natural factors and elements, such as mountains, rivers and valleys, without any human intervention.
- **Man-made spaces:** they are spaces that man creates and shapes. Man-made spaces include external spaces, internal spaces, and semi-public spaces.

Characteristics of urban spaces (1)

The characteristics of urban spaces are related to the users and the activities and functions they perform in these spaces. They play a key role in the success of these activities and functions that the users perform, due to their significant impact human movement, reactions, and feelings within these spaces.

These characteristics can be clarified as follows:

- **Proportions:** the proportions of an urban space are the relationship between its length, width, and height. The urban spaces can be subsequently divided in terms of proportions into: (Longitudinal spaces “corridors,” deep urban spaces, expanding space)
- **Scale:** (Friendliness Scale - Human Scale – Memorial Scale)
- **Contain-ability:** (highly containing space - moderately containing space - poorly containing space - non-containing space)

Components of urban spaces and their connection with the fulfillment of the needs of individuals (1)

Physical components and human activities are the two main factors that determine the character and formation of urban space (Figure 6).

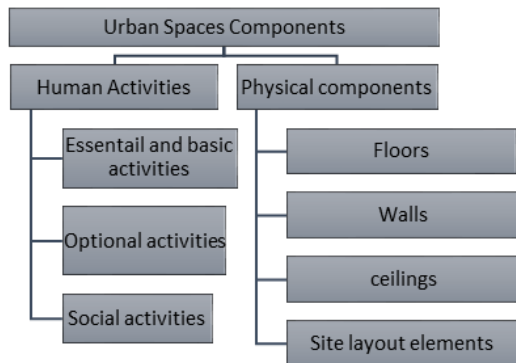


Figure 6: Chart showing the components of urban spaces
Source: prepared by the researcher

First, the physical components:

The physical components are what gives an urban space its distinct shape and character

1. **Floors** form the base of the urban space in which the various activities revolve. They are a very important element in such urban spaces in the city center, as they facilitate the movement of vehicles and pedestrians. Floors play a shared role with walls in defining the character and shape of an urban space. In this regard, floors may be flat, inclined, or multi-leveled, as used when several spaces are designed within one space by multi-leveling.
2. **Walls** are the vertical plane that defines the urban space in terms of shape, size, and other characteristics. Walls used in urban spaces vary according to the function specified. Walls can be either natural walls, such as trees, or physical ones, such as solid walls, light fences, and columns. Walls influence the psychological impression of an urban space, as traced in affecting movement and privacy
3. **Ceilings** represent the point determining the end of an urban space from above. Alongside its protective function, walls give an urban space a certain scale or a special character. For instance, the ceiling can be solid and permanent, such as ceiling made of concrete or steel. They can also be light, such as ceilings made of fabrics and plastic, or composed of plants.
4. **Site layout elements** (complementary elements) include furniture, bedding, and everything that exists in the urban space, such as trees, plants, statues, water basins or fountains, benches, lighting poles, signposts, mailboxes, and any other element that can be used within the space. These elements are used to perform a functional or aesthetic role within the space. They can be divided into (Figure 7)

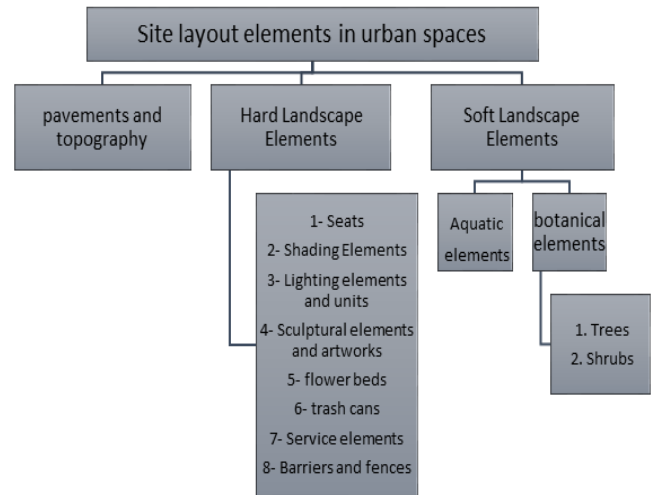


Figure 7: Chart showing Site layout elements in urban spaces
source: prepared by the researcher

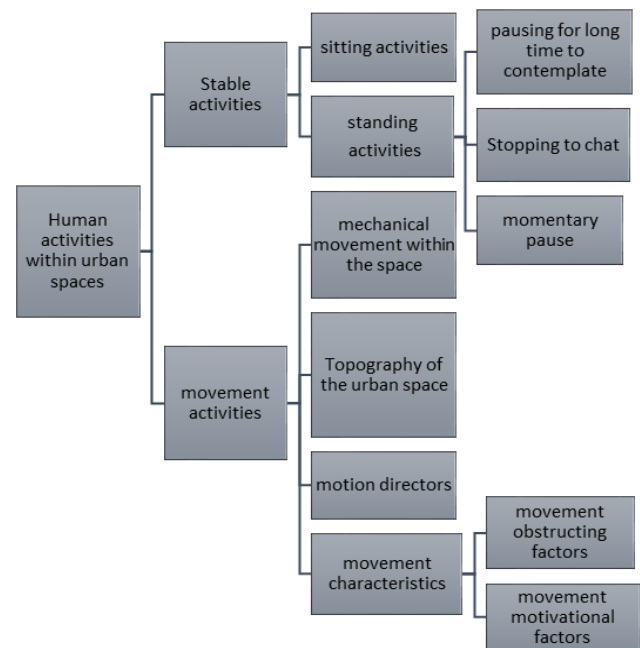


Figure 8: Chart showing human activities within an urban space
Source: prepared by the researcher

Types of human activities in urban spaces (1)

Human activities in urban spaces can be divided into:

- Movement activities
- Stable activities

First, movement activities:

Movement activities are determined by the mechanisms of motion, as well as pedestrian activity in all its various forms. These activities can be divided into:

- Movement characteristics: these characteristics are made manifest in movement motivational factors, as well as movement obstructing factors.
- Motion directors: the contain-ability and the shape of the urban space are among the basic factors that help direct movement within. The furnishing of the urban space,

- whether natural or man-made, also determines and motivates movement direction within the space.
- Topography of the urban space: the flat surface floor of an urban space facilitates movement and provides vision clarity in all directions, which creates a sense of overall safety.
 - Mechanical movement within the space: the studying of any urban space necessitates the identification of some important points related to the mechanical movement:
 - The kind of the mechanical movement inside the urban space in relation to private cars and the various means of transportation.
 - The visual effects of the mechanical movement inside the space, as traced in the degree of their presence and their intensity
 - The auditory effects of the mechanical movement within the space
 - The kinetic effects of the mechanical movement within the urban space resulting from the density and speed of these effects within the space

Second, stable activities: these activities include the human behavior conducted in any urban space.

In this regard, the stable activities involve resting, sitting, social meetings, talking, discussions, and any form of gathering around the water fountains and gardens. Therefore, the urban space in which these activities are carried out must be equipped with the accommodations and the capacity the motivate calmness and comfort. Subsequently, an urban space must be equipped with seats, trees site layout elements. It should also display eye-catching elements that attract the users' attention.

Stable activities can be divided into two types: activities done while standing and activities done while being seated.

Human behavior in the built environment (5)

Human behavior in the built environment is the product of any interaction that creates a psychological balance between the basic and the sensory needs, aiming at satisfying the user's psychological and the social needs, such as a sense of safety and belonging. However, in the event that the user's need is not fulfilled, the behavior of the individual may be affected, causing the formation of negative behavioral patterns. It can be thus concluded that human behavior consists of a successive series of actions and reactions taken by man in his continuous attempts to achieve his goals and satisfy his

various needs during his interaction with the surrounding environment.

The psychological processes of human interaction with the surrounding environment (9)

1. **Perception** is a mental process that is built on the ability to understand and analyze information transmitted by the senses to the human brain.
2. **Motive** is defined as a state of internal readiness that works to direct behavior towards a specific end or goal. This means that every human behavior is driven by certain causes that manifest in certain motives. These motives are the ones the influence a person to work on satisfying his various needs with the help of his past experiences.

Motives that drive human behavior can be categorized into: (9)

1. **Physiological motives**, including hunger, thirst, breathing, pain, etc.
2. **Psychological motives** include two qualitative categories:

Individual motives, such as curiosity, achieving competence, and need for achievement.

Social motives, such as the need of belonging, the motive of having control, independence, ownership, and participation.

Maslow divided needs into five main levels: (Figure 9)

1. Physiological needs (Food and drink)
2. Safety needs (safety and security)
3. Love and belonging needs
4. Esteem needs
5. Self-actualization needs

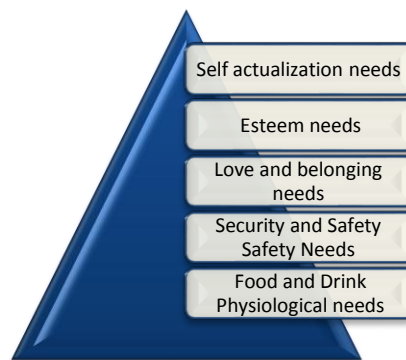









Figure 9: Maslow's hierarchy of human needs
source: prepared by the researcher

Classification of human needs within the urban spaces of city centers(10)	
First, the physiological needs. These needs are divided into two types in relation to the users	
1- Physical design needs: these include the needs that the users require to practice their various activities within the urban space and to fulfill their physiological needs through the services that are provided to them in the urban space, which should be well designed and in good condition as well. These needs are the top priority for users.	
P.F	a) <u>The need for areas that allow the practice of different activities</u>

	<p>The behavior of individuals is affected by the availability of integral areas that allow the practice of activities. These areas bring comfort to the users who practice various activities, such as sitting, relaxing, reading, and contemplating. They also contain children’s play areas and other facilities. Through the site layout elements used in these areas, they create a sense of comfort that positively affects human behavior. To the contrary, human behavior is negatively affected by the absence of some of these elements. The following are some of the activities practiced in the urban spaces:</p> <p><u>Seating areas:</u></p> <ul style="list-style-type: none"> - Seats must be available in sufficient numbers for users - Seating areas should be service areas, shaded areas, children's play areas and attractive sights - Seats must be diversified in the manner of accommodating users, either individual seats or seats that accommodate multiple individuals (Figure 10) <p><u>Children’s play area</u></p> <ul style="list-style-type: none"> - Rubber floors should be used to provide a sense of safety for the children, in case they fall on the ground - Seats should be placed around the play area to increase the sense of safety - The play area should be shaded to protect the children from the sunlight (Figure 11) <p><u>footpaths</u></p> <ul style="list-style-type: none"> - Footpaths in urban spaces should be designed creatively to attract users and encourage them to walk down the paths for the longest time possible. - Footpaths should be decorated with trees, colorful shrubs, and flowerbeds, in order to add an aesthetic touch that brings joy to the users treading these footpaths - Plants and umbrellas should be used to shade the footpaths to protect the pedestrians from the sunlight(Figure 12) - Pedestrian traffic should be separated from car traffic to ensure the safety of the users 	 <p>Figure 10: Seating areas</p>  <p>Figure 11: Children’s play area</p>  <p>Figure 12: Footpaths</p>
	<p>b) <u>The need for service areas</u></p> <p>Service areas are those that fulfill the basic and physiological needs of users, such as cafeterias, toilets, parking lots, etc. The sufficient availability of these service elements does not only fulfill the users’ needs, but it also provides them with a sense of comfort within the urban space and encourages them to spend more time inside the space.</p> <p>There are some points that must be taken into consideration in the designing of service areas:</p> <ul style="list-style-type: none"> - The availability of clear paths that lead to such areas - Following a balanced distribution of the cafeterias and toilets in the urban space so that they could be easily accessed - The availability of guide signs to direct movement 	 <p>Figure 13: Light fixture</p>
	<p>c) <u>The need for structural facilities</u></p> <ul style="list-style-type: none"> - <u>Seats:</u> they must the floors in regard to their formation and finishing materials. - <u>Trash cans:</u> they must be made of materials that resist the various weather conditions. They must be kept sealed to prevent insects from gathering. - <u>Light fixture:</u> different types of lighting elements can be used, such as light poles for general lighting, spotlights, in-floor lighting for the pedestrian footpaths, etc. (Figure 12) - <u>Flowerbeds:</u> they must be equipped with outlets to drain the water and made of durable and distinct materials that match the surrounding elements. - <u>Guide signs and signposts:</u> they should be fixated in central places. - <u>Awnings:</u> they should be used in sitting areas and footpaths. They must be made of materials that match the surrounding elements and resist the various weather conditions. - <u>Botanical elements:</u> large shade trees should be planted around sitting areas and as an outline of footpaths and entrances. Shrubs can be planted as fence that separates one activity from the other. - <u>Floors:</u> the flooring finishing material should vary depending on the type of activity. For example, the floors used in pedestrian footpaths should differ from those in car lanes or children's play areas. 	 <p>Figure 13: Light fixture</p>
<p>2- Non-physical design needs: these are the needs that the designer overlooks when designing an urban space</p>		
<p>Non-physical design needs</p>	<p>a. <u>The need for rest</u></p> <p>The urban space within the center must provide its users with a sense of comfort and belonging so that they can spend the longest time possible there. This sense of comfort includes environmental, social, and physical comfort factors. These factors are the secret responsible for the success of urban spaces because they motive users to be more willing to enter and enjoy the spaces in the city center, as they become relaxed and psychological comfortable (Figure 14).</p> <p>These are some of the factors that can be used to fulfill the need for rest:</p> <ul style="list-style-type: none"> - Using trees as natural windbreaks and using dense plant elements to direct the wind inside the spaces. - Taking into account the changes in the climate throughout the day in terms of the amount and intensity of sunlight, shade, and wind. 	

	<ul style="list-style-type: none"> - Providing protection from loud and annoying sounds and excluding any activity that generates noise from the urban spaces. - Using water to cool and reduce air temperature. - Following a diverse pattern regarding the use of trees, shrubs, flowers, water, etc. - Following a diverse pattern regarding the use of shapes, colors, and textures of the different elements in the urban spaces. <p>b. Interconnection: Interconnection and interdependence in design are achieved through the repetition of certain elements and the unification of the materials used while adding certain distinguishing touches between the organized elements in the same area (Figure 15).</p> <p>c. Enclosure: To avoid being abused for unsafe purposes and to achieve privacy, urban spaces should be partially enclosed, not totally.</p> <p>d. Clarity: The movement of the users within the urban space must be directed so that they can reach and return from their destinations easily and clearly and to be able to move between different activities with such ease.</p> <p>e. Privacy: It is a very important element in the design of urban spaces. It can be achieved using one of the means of separation such as trees or fences. It can also be achieved by having multiple levels in the urban space.</p> <p>f. Feeling safe and protected: Security and safety needs are among the basic human needs within the urban space. They can be realized through the following:</p> <ul style="list-style-type: none"> - Separating pedestrian and vehicular traffic. - Securing pedestrian paths and removing any obstructing solid elements. - Providing sufficient lighting elements at all points within the urban space and along the pedestrian footpaths - Clarity and accessibility of the urban space for both pedestrians and drivers. - Adequate use of guide signs within the urban space. <p>g. Social needs The urban spaces should not be devoid of meaning to allow individuals to form strong relationships with the place and allow effective interaction and communication between the users of the space. This subsequently strengthens social communication between users, as these urban spaces provide a democratic atmosphere, where the rights of users are protected, as well as freedom of action is asserted for all individuals and groups. In this regard, the urban spaces respond to the social needs of the users through the following:</p> <ul style="list-style-type: none"> - Setting up group activities in the public urban spaces within the city center. - Arranging the site layout elements and sitting areas in such a way that allows social communication between users. <p>h. The need for contemplation and reading:</p> <ul style="list-style-type: none"> - Using calm colors that easy on the eyes. - Shading the ceiling of the urban space with natural or artificial ceilings. - Using comfortable seats that encourages conversation. - Placing seats in front of beautiful and attractive scenery. 	<p>Figure14: comfortable seats for people</p>  <p>Figure15: Interconnection area</p>
<p>Second: Psychological and psychological needs: these are the basic psychological needs required to attain happiness, integration, and psychological growth for individuals and users of urban spaces. These needs include the need for independence, the need for achieving competence, and the need for a sense of belonging.</p>		
<p>Psychological and psychological needs</p>	<p>Brightness: light and cheerful colors should be used in urban spaces. In addition, adequate lighting should be provided in the urban space to add a sense of clarity and safety to the user.</p> <p>Spaciousness: a sense of spaciousness should be created by utilizing the contrast between the covered section and exposed section of an urban space and by depending on interconnection between the different urban spaces so that the user would feel free in a spacious and commodious urban space.</p> <p>Openness: the design of the urban space should take into account keeping the view visually open near the footpaths and walkways within the urban space because visually closed views may cause fear and prevent the user from feeling safe.</p> <p>Nature and the natural elements: the urban space design should utilize the natural elements, as in plants, to create aesthetic and artistic landscapes and formations within the urban space. Nature can also be used to maintain the design principles of unity, balance, and diversity.</p> <p>Organization: all the elements of the urban space must be organized with clarity so that the user can move freely and confidently and not feel lost or misdirected.</p> <p>Complexity: By attracting the attention and reducing the sense of boredom, complexity increases the user's desire to contemplate the surrounding scenery and try to understand it more.</p> <p>Joy: through the interdependence and interconnection between the different elements within the urban space, the user should be filled with joy.</p> <p>Control: each urban space must contain a certain landmark that distinguishes it from other urban spaces.</p> <p>Excitement: the use of winding footpaths within the urban space can prevent boredom and motivate the users to complete their walk in these paths.</p>	

III. CASE STUDY ANALYSES

We will discuss an analytical example of an urban space in the center of Abu Dhabi city, and it will be studied in detail, according to what was explained to apply the advantages in it in Egyptian cities in future research

Abu Dhabi city

Reason for selection

The city of Abu Dhabi was chosen as a case study in this research due to its interest in human needs in the design of buildings and urban spaces, and there are many experiences and projects that we can benefit from and apply them in Egyptian cities

Abu Dhabi city history

The modern history of Abu Dhabi began when the Banu Yas tribe left their homeland, Liwa, to search for fresh water. They discovered Fresh water in Abu Dhabi in the eighteenth century, and the Banu Yas resided there and practiced fishing. (Qasr Al Hosn) was built to protect the city, and it is the first and oldest stone building in Abu Dhabi.

Qasr al-Hosn was the seat of the government and the ruling family until 1966. Residential buildings were extended along the coast around Qasr al-Hosn, as it was the center of the city and the seat of the government and the ruling family in that period. Recently, the palace was turned into a museum after the completion of the restoration work, and it was opened in 2018.

Abu Dhabi city planning

In 1968, the ruler of Abu Dhabi, Sheikh Zayed bin Sultan, asked the United Nations to send him a city planning expert to prepare the general plan for the city of Abu Dhabi. The Egyptian architect Abdel Rahman Makhlof has been nominated to plan the cities of Abu Dhabi and Al Ain. The main objective of the urban planning of the city was to provide a decent life for the human being and the human needs in the design

Abu Dhabi city center

Al Hosn area is the center of Abu Dhabi city it has a lot of services, commercial, administrative and residential buildings, markets and gardens (Figure 16 - 17).



Figure 16: Abu Dhabi city map showing the city center source: google map



Figure 17: Center of the city - source: google map

We will study the capital park (an urban space in the center of Abu Dhabi city) and identify the suitability of urban space to human needs.

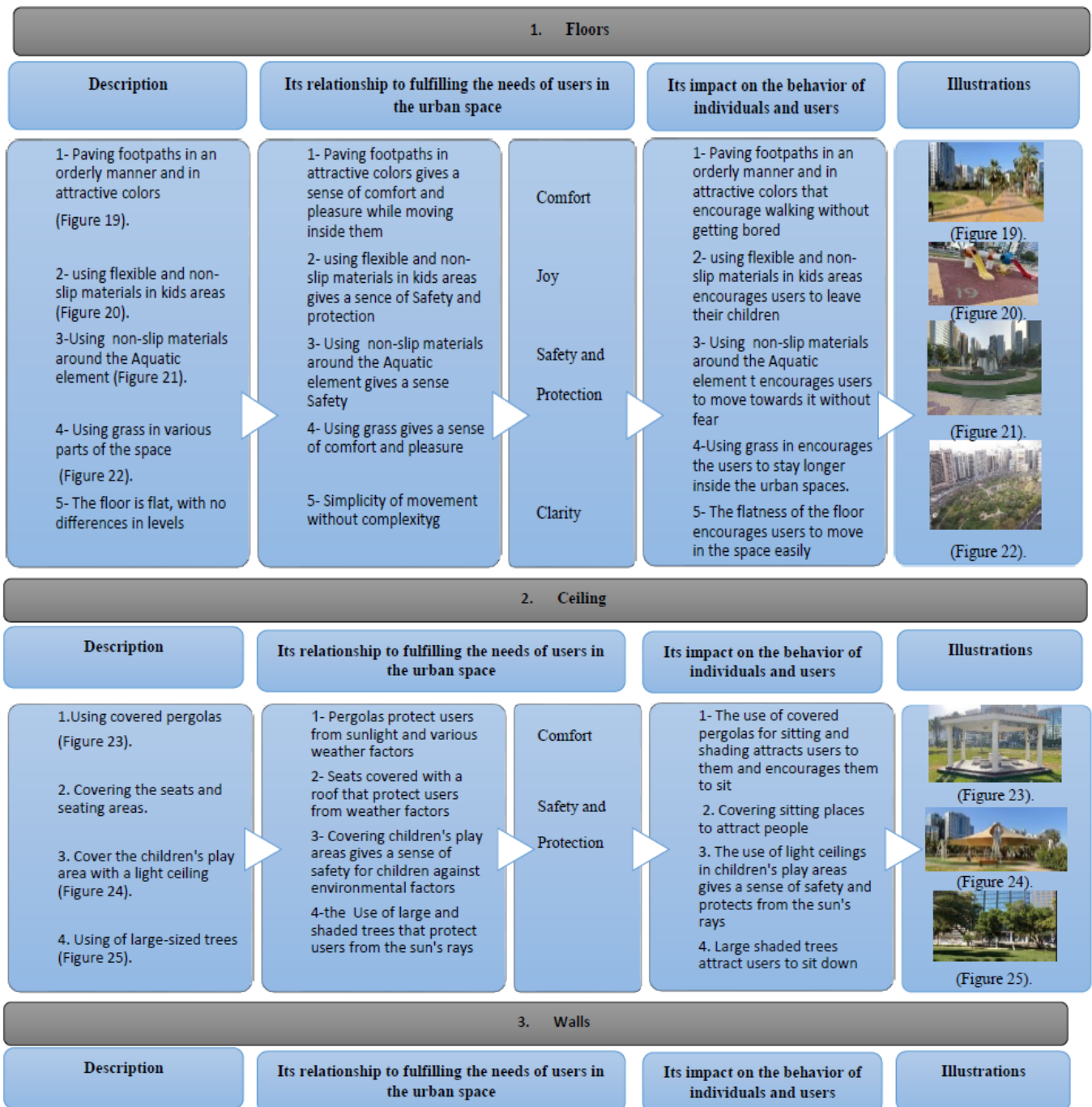
About the park

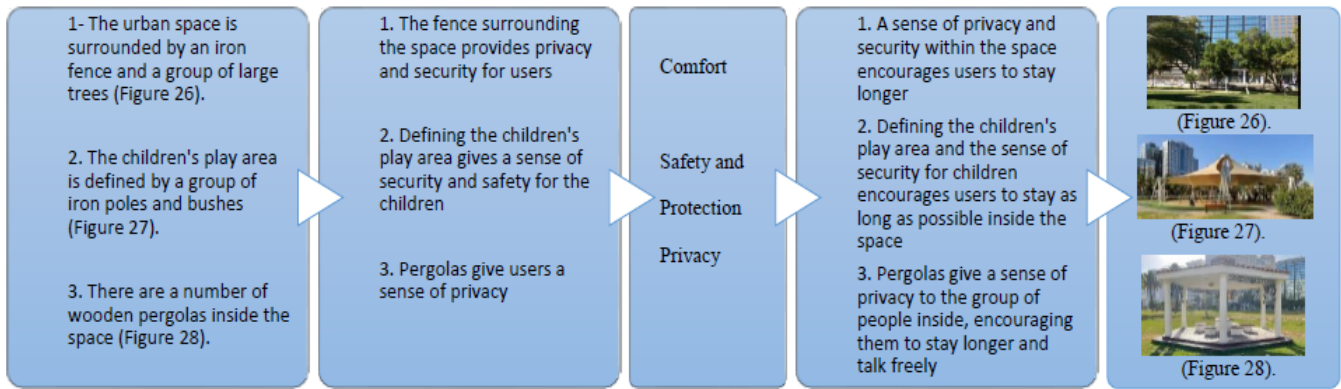
The Capital Park is one of the oldest parks in Abu Dhabi. It is considered the oldest in the whole emirate it was opened in 1976 on an area of 56000 square meters in the city center, it is considered one of the most beautiful parks in Abu Dhabi, which is visited by individuals and is surrounded by many important, tourist and commercial buildings (Figure 18).



Figure 18: Capital Park source: google map

The study will be conducted on the basis of studying the components of the urban space in the city center and their effect on fulfilling the needs of users within urban spaces in city centers, as well as their impact on the behavior of individuals Based on the principles explained.


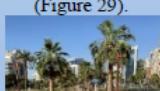






4. Site layout elements in urban spaces

a- natural site layout elements

I. botanical elements

Description	Its relationship to fulfilling the needs of users in the urban space	Its impact on the behavior of individuals and users	Illustrations	
<p>1. There are a large number of large shaded trees (Figure 29).</p> <p>2. The space contains trees and palms on the sides of the footpaths (Figure 30).</p> <p>3. The grass covering a large area in the urban space (Figure 30).</p> <p>4. The urban space contains small bushes that separate the different activities - children's play areas and footpaths (Figure 31).</p>	<p>1- trees protect from the different weather conditions and provide shades for users.</p> <p>2- The trees and palms on the sides of the footpaths give a sense of security and safety during movement in the space and protect the users from the sun</p> <p>3- The green color of the grass gives a sense of comfort and joy to the users</p> <p>4. Separation of activities gives a sense of comfort and safety</p>	<p>Comfort</p> <p>Joy</p> <p>Safety and Protection</p> <p>Privacy</p>	<p>1. Users are attracted to the shaded areas</p> <p>2. trees and palms on the sides of the footpaths direct the movement of users in the paths</p> <p>3. Large areas of grass in the urban space encourage users to stay longer inside the space to enjoy and calm down</p> <p>4. The separation between different activities is an attraction point for many users</p>	 <p>(Figure 29).</p>  <p>(Figure 30).</p>  <p>(Figure 31).</p>

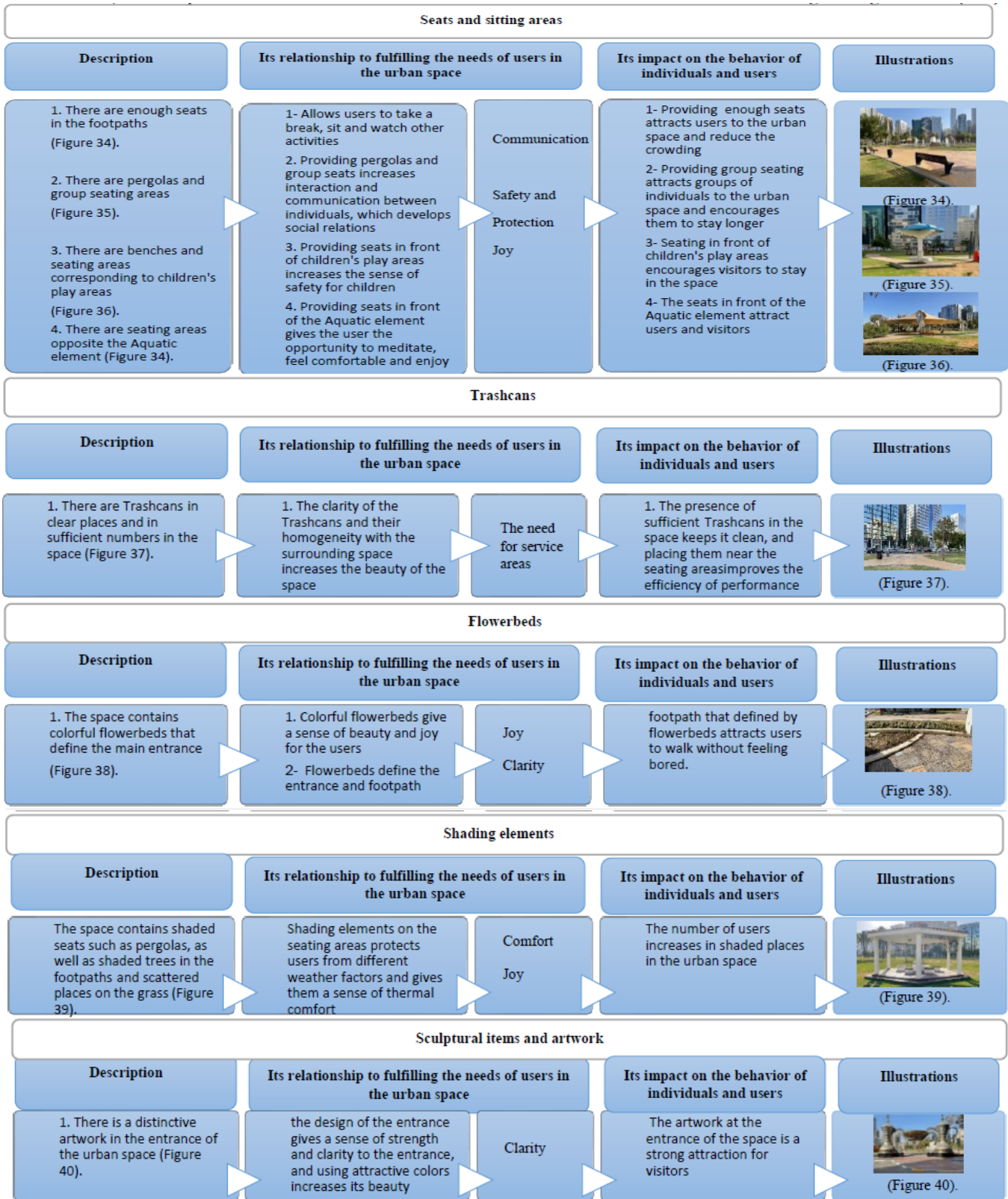
II. Aquatic element

Description	Its relationship to fulfilling the needs of users in the urban space	Its impact on the behavior of individuals and users	Illustrations
<p>The urban space contains a Aquatic element with water fountains (Figure 32).</p>	<p>The Aquatic element gives a distinctive shape to the urban space and gives a sense of pleasure to the users and reduces the air temperature inside the space</p>	<p>Joy</p>	<p>The water element is an attractive element in the urban space, as it attracts people from all directions</p>  <p>(Figure 32).</p>

b- Artificial site layout elements

Lighting elements






Description	Its relationship to fulfilling the needs of users in the urban space	Its impact on the behavior of individuals and users	Illustrations
<p>1. There are enough light poles in the space</p> <p>2. The Aquatic element is illuminated in various colors (Figure 33).</p>	<p>1- Well-lit areas gives a sense of safety for users</p> <p>2- The colors of lighting in the aquatic element give vitality to the space</p>	<p>Safety</p> <p>Joy</p>	<p>1. Well-lit places attract users</p> <p>2. Lighting the aquatic element in different colors attracts visitors</p>  <p>(Figure 33).</p>











IV. RESULTS






According to the above data, we can infer the interrelationship between the physical components, as in the floors, walls, ceilings, and site layout elements, of urban

spaces and their effect on fulfilling the needs of users within urban spaces in city centers, as well as their impact on the behavior of individuals, can be thus deduced.

Urban spaces in city centers		Its relationship to fulfilling the needs of users in the urban space		its impact on the behavior of individuals and users	
Description		Description	Needs fulfilled	Description	Illustrations
Urban Spaces Flooring	Floors form the base of the urban space in which the various activities revolve. Floors may be flat, inclined, or multi-leveled	<ul style="list-style-type: none"> - The materials used to cover the floors vary according to the type of activity carried out. For example, the flooring of sitting areas is made of stone materials or grass. Children's play areas are covered with sand or rubber to protect the child when falling on the ground, and so on. - Using colorful flooring and grass attracts users to urban spaces, gives them a sense of comfort, and encourages them to stay longer inside the urban spaces. - Paving footpaths in an orderly manner and in attractive colors that encourage walking without getting bored. 	Safety and protection Comfort Brightness Joy Organization Clarity	<ul style="list-style-type: none"> -The difference in levels within the spaces gives a wider field of vision, which prevents boredom from taking place. (Figure 41). - The footpaths that are designed in a distinctive way, using attractive colors, attract users and direct movement within the space. (Figure 42). 	 <p>(Figure 41).</p>
					 <p>(Figure 42).</p>
Urban Spaces Walls	Walls are the vertical plane that defines the urban space in terms of shape and size. Walls can be either natural walls, such as trees, or physical ones, such as solid brick walls or metal walls. Walls play an essential role in determining the privacy of the urban space and directing the movement within it.	<ul style="list-style-type: none"> -The higher the wall the greater the privacy and contain-ability provided. - Shorter walls and shrubs, on the other hand, lower contain-ability. 	Privacy Protection comfort	<ul style="list-style-type: none"> -Using large trees for shade. (Figure 43). - Using pergolas inside the urban spaces gives a sense of privacy for those sitting inside. (Figure 44). - Using bushes or poles to surround and outline children's play areas to provide privacy, as well as safety for the children. 	 <p>(Figure 43).</p>
					 <p>(Figure 44).</p>
Urban Spaces Ceiling	Ceilings represent the point determining the end of an urban space from above. It provides both shade and privacy for the users.	<ul style="list-style-type: none"> -Using light-material ceilings for the external section in urban spaces, such as umbrellas for seats, and wooden ceilings such as pergolas, gives a sense of privacy for the users and protects them from the sunlight. -Ceilings, as height determiners in the external urban spaces, create a sense of safety as well. 	Safety and protection Privacy Comfort	<ul style="list-style-type: none"> -Using light-material ceilings for the external section in urban spaces, such as umbrellas for seats, and wooden ceilings such as pergolas, gives a sense of privacy for the users and protects them from the sunlight. (Figure 45). - Ceilings, as height determiners in the external urban spaces, create a sense of safety as well. 	 <p>(Figure 45).</p>

Site layout elements		Its relationship to fulfilling the needs of users in the urban space		its impact on the behavior of individuals and users	
Description		Description	Needs fulfilled	Description	Illustrations
natural site layout elements	botanical elements	<ol style="list-style-type: none"> 1. Green areas cool the air temperature inside the urban space. 2. Trees provide shade within the urban space to sit under or do any other activity. 3. The bright green color of these areas gives a sense of comfort and joy to the users, which is intensified by the other different colors of flowers and shrubs. 	Comfort Protection Joy Brightness Natural element	Users prefer to sit near trees to be adequately shaded and protected from sunlight. (Figure 46). The footpaths outlined with flowerbeds and colorful shrubs attract individuals and encourage them to walk through them without feeling bored.	 <p>(Figure 46).</p>

	Aquatic element	<ol style="list-style-type: none"> The aquatic element adorns the urban space in the city center with a distinctive shape, rejuvenating its vitality, which attracts users to enjoy the beautiful view. The use of slip-resistant flooring materials gives a sense of safety for the user. The aquatic element cools the temperature of the urban space and gives a sense of psychological comfort to users. 	Safety and protection comfort control joy Natural element	Diversifying the use of the aquatic element does not only rejuvenate the vitality of the urban space, but also strongly attracts the users. (Figure 47). Placing the aquatic element in a prominent and visible place from all sides strongly attracts the users as well.	 (Figure 47).
Artificial site layout elements	Seats and sitting areas	<p>Seats and sitting areas should be provided in appropriate numbers to accommodate the visitors. In addition, sitting areas should be organized in a way that encourages social communication between the individuals. (Figure 48).</p> <p>Seats should be made of highly durable materials that leave the user feeling safe and comfortable. Shades must be provided adequately in sitting areas to encourage users to sit as much as possible.</p> <p>Seats must be placed in front of beautiful scenery to attract the users and allow them to sit and enjoy their time.</p>	Social needs comfort Safety and protection joy	<p>The availability pergolas and seats that accommodate multiple users' increases interaction and communication between individuals, which develops their social relationships.</p> <p>Providing adequate seats in front of children's play areas increases the sense of safety and prolongs the time period users spend in urban spaces.</p> <p>Providing seats in front of the aquatic element and attractive views attracts visitors and gives them a sense of comfort and joy. (Figure 49).</p>	 (Figure 48).  (Figure 49).
	Sculptural items and artwork	<p>Artworks give value to the place in which they are placed. They add a distinguishing touch to the space, which attracts visitors. (Figure 50).</p>	control	<p>The more suitable artistic element to the nature of the space, in which it is located, the more attractive and distinguishing it becomes.</p> <p>The use of colors and materials suitable for the artwork increases the beauty of the urban space and attracts visitors.</p>	 (Figure 50).
	Shading elements	<p>Shading elements protect from the different weather conditions and provide shades for users. This creates a sense of comfort and encourages them to stay longer.</p>	Safety and protection comfort Joy Spaciousness	An increase in the number of users in the shaded areas within the urban space takes place. (Figure 51).	 (Figure 51).
	Lighting elements	<p>Lighting provides an element of safety and security within the urban space.</p> <p>Using a diversity of colors and lighting sources gives vitality to the urban space and prevents boredom.</p>	Safety and protection clarity Joy Brightness	<p>Well-lit areas witness an increase in the number of users, as they feel safer. (Figure 52).</p> <p>Pedestrian footpaths that are lit in a variety of ways and attractive colors encourage users to walk through them.</p>	 (Figure 52).
	Barriers and fences	<p>Barriers and fences are used to separate automatic movement from pedestrian movement, which provides a sense of safety to the users. (Figure 53).</p>	Safety and protection	Barriers in urban spaces should have an aesthetic shape, as they give a sense of safety during movement, which increases the number of users in the urban space.	 (Figure 53).

	Flowerbeds	The beautiful and colorful flowerbeds separate the different activities from one another in a way that brings joy and comfort to the users. (Figure 54).	clarity Brightness Joy	Flowerbed outline and surround pedestrian footpaths, which encourages users to move without feeling bored.	 (Figure 54).
	Trashcans	Trashcans, when placed in clear places and in sufficient numbers, maintain the cleanliness of the urban space. However, they should match the surrounding elements in the urban space to avoid negatively affecting its visual image.	The need for service areas	The beauty and efficiency of an urban space is increased by the availability of trashcans, especially when their colors match the surrounding elements and when they are placed in clear and near places (Figure 55).	 (Figure 55).
	Service elements	Services elements, such as toilets, mosques, cafeterias, water fountains, parking lots and others, are based on fulfilling the basic needs of users so that they could stay in the urban space for a longer time (Figure 56).	The need for service areas	The efficient of an urban space is intensified by the presence of service elements, which motivates the users to remain for the longest time possible.	 (Figure 56).
The Topography of the urban space	Stairs	Stairs connect the different levels of an urban space together (Figure 57). They can be used by the users for sitting and socializing.	Interconnection Excitement Joy	Using safe and slip-resistant finishing materials provides a sense of safety within the urban space.	 (Figure 57).
	slopes	Slip-resistant finishing materials are used in the flooring of slopes to provide a sense of safety and security during movement. (Figure 58).	Excitement Joy	Slopes reveal and reflect the scenery behind them, which motivates the users to explore during their walk towards their destination.	 (Figure 58).

A table showing the interrelationship between the site layout elements and their effect on fulfilling the needs of users within urban spaces in city centers, as well as their impact on the behavior of individuals - Source: prepared by the researcher

V. DISCUSSION

The result shows above the relationship between human behavior and achieving the satisfaction of human needs. Human need is one of the urban space aims which play an important role in its success and performs the required function, which makes it more popular with users.

VI. RECOMMENDATIONS

- Stressing the importance of human element in the processes of developing and designing urban spaces in city centers.
- Taking into account the various activities that take place in the urban space.
- Utilizing site layout elements to strengthen and support the vitality of an urban space.
- Connecting urban spaces in city centers with pedestrian footpaths and residential areas.
- Separating pedestrian traffic from car traffic in city centers

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