

A Critical Review of Quality Assessment Tools for Public Spaces

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Abstract:

During the last decades, public spaces gained much attention from experts and researchers who sought to study factors affecting the quality of such spaces, and evaluate the extent of user satisfaction inside these spaces. Many assessment indexes and toolkits were developed to evaluate the quality of public space and specify the weak points that need development. This study aims to clarify similarities and differences between these tools and to highlight different methodologies of assessments, and presents the extent to which these tools meet human needs by comparing between seven of assessment tools; The project of public space (PPS), Gehl Assessment toolkit, CABE Space shaper, UN-Habitat Public space site-specific assessment, Place Standard Tool, The Good Public Space (GPSI) index, and Great Public Space toolkit, in terms of the assessment tool's aim, structure, methodology, scoring system, and by discussing strength and weakness of each tool, to define the most comprehensive index from human needs point of view. The comparison showed differences between the assessment tools in assessing methods and in their assessment criteria according to the theory or principles that they follow. The study deduced a set of common criteria categorized according to human needs, and noticed a wide range of coverage of social and aesthetic aspects more than the other aspects, the study found that UN-Habitat, GPSI are the assessment tools that covers most aspects of human needs and are thus considered to be the most comprehensive.

Keywords: Quality, Public Spaces, Assessment Tools, Human Needs.

Introduction:

Well-designed urban public spaces play a vital role in enhancing individual well-being and contribute positive social, economic and environmental values, quality of public spaces can be the making of a place, attracting people to live, work, visit and invest in a particular area (CABE Space, 2005b)¹. Many assessment tools aim to evaluate the quality of public space by identifying set of indicators that meet user needs and requirements in the space, several design theories discussed human needs in the built environment, as urban spaces are designed to fulfill specific users' needs,

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Meanwhile, many human needs theoretical models were developed over time, the most widely known model is the one developed by Abraham Maslow (1943, 1954) and expanded later in (1960, 1970).

Maslow suggested that there are two sets of motivations: the first set aims to fulfill basic needs such as physiological, safety, social, and esteem needs. Such needs are called “deficiency needs”. The second set aims to fulfill advanced needs including cognitive, aesthetic, self-actualization, and self-transcendence needs. They are called growth needs (Maslow, A. H.1954).²

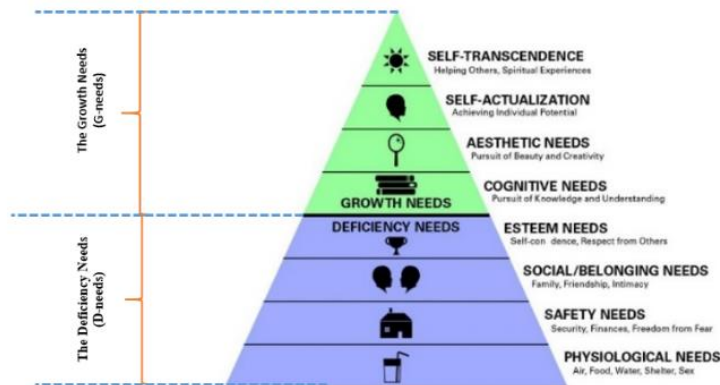


Figure (1) the expanded hierarchy of needs by Maslow (Reference: Maslow, A. H. (1979)³)

Many researchers discussed human needs in the built environment including Carr et, al (1992) who proposed five types of reasons that seem to account for people's needs in public spaces; comfort, relaxation, passive engagement, active engagement, and discovery (Carr, S.1992)⁴. Smith et, al (1997), provided principles of users’ needs in public areas, in order to enhance community quality in the public spaces, derived from social and psychological theories⁵, and Lynch’s theory of good city form⁶ which consists of livability, character, connection, mobility, personal freedom, and diversity aspects. John Lang (2010), provided his theory of functionalism, based on Maslow’s expanded hierarchy of needs⁷ He developed a complex diagram illustrating the connections and interactivity between human needs in the built environment as shown in the following figure:

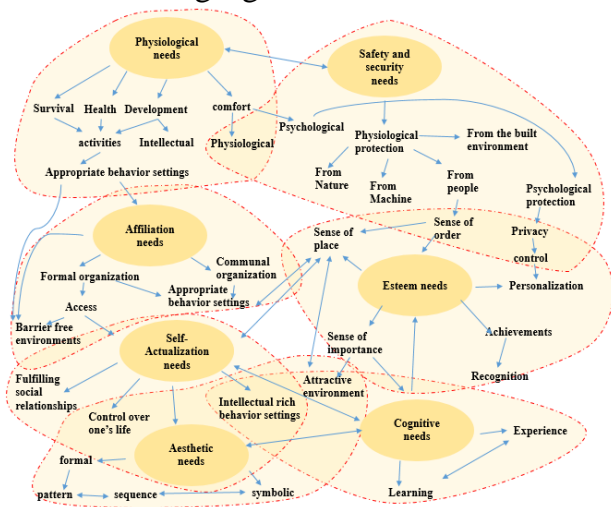


Figure (2) Lang diagram of human needs in the built environment (reference: Lang, J., & Moleski, W. (2010)⁷).

This study provides a comparative analysis between seven selected assessment tools to present the extent to which these tools meet human needs through their indicators, clarify differences between them, and highlight different assessment methodologies by comparing them

1. Overview of the selected Assessment tools

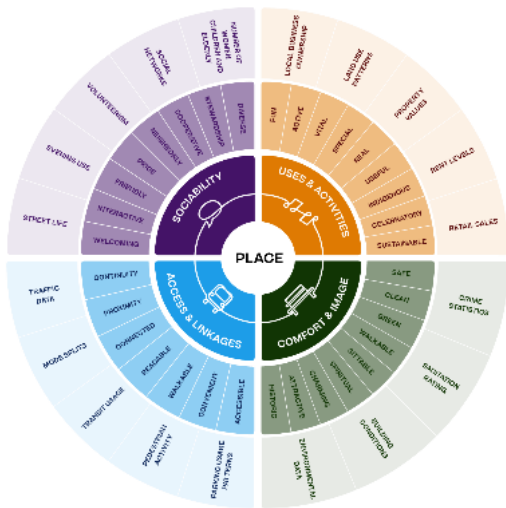
Several public space assessment tools were developed in different countries. This study would critically review and compare a selected number of those tools, to discuss the effective factors in the assessment method from different point of view. The selected assessment tools are; (The project of public space) (PPS), Gehl Assessment toolkit, CABE (Space shaper) UN-Habitat Public space site-specific assessment, Place Standard Tool, The Good Public Space (GPSI) Index, and Great Public Space toolkit. Those tools were selected according to specific criteria;

- Year released: the selected assessment tools were all developed after the year 2000.
- Tool Country: all the selected tools were released from different countries all over the world, to analyze how that could affect the assessment indicators.
- Tool scope: the selected tools varied between global and local scope
- Tool scale: the selected tools were used to assess quality on the urban public space scale

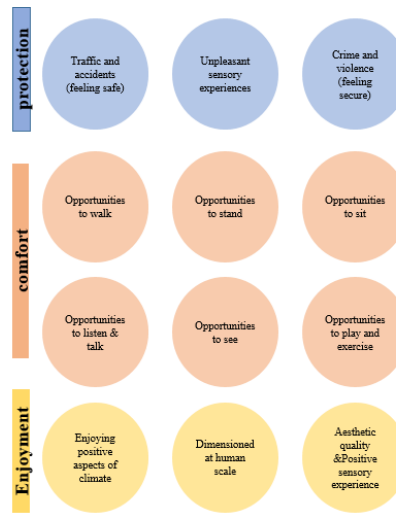
The Project of Public Space “PPS”: Developed in 2000, PPS is a cross-disciplinary non-profit American organization that helps people create and sustain public spaces that build strong communities, “PPS” based its principles on William Whyte’s approach⁸, as he developed “the place diagram“ as a tool to assist in evaluating the quality of public space⁹.

Gehl Assessment Toolkit: Jan Gehl in 1987 published his book “Life between Buildings” and discussed the different types of outdoor activities, and the effect of the surrounding environment qualities on using the space to achieve three main objectives; protection, comfort, and enjoyment¹⁰ in order to enhance quality of public spaces. In 2000, Gehl Institute established Gehl assessment toolkit based on the 12 indicators.

CABE “The Space Shaper”: CABE is the Commission for Architecture and the Built Environment, it is the government’s advisor on architecture, urban design and public space in UK¹¹, CABE Space is a specialist unit within CABE that aims to bring excellence to the design, management and maintenance of parks and public space. In 2007, this unit proposed “space shaper” a practical toolkit for local community activist or a professional use to measure the quality of a public space before investing time and money in improving it, which works by capturing the perceptions of both the professionals involved in running a space and the people that use it.



Figure(2) merging the place diagramme by william whyte with PPS qualities



Figure(3) Gehl toolkit 12 indicators

UN-Habitat Public space site-specific assessment: In 2012, UN-Habitat launched its Global Public Space program with the objective of promoting public spaces as a keystone for sustainable cities in order to ensure good quality of life for all. The program concentrated on the community needs in a specific public space. This assessment guides the user to turn the selected space into safe, inclusive, accessible, comfort, and green space ¹²



Figure (5)UN-Habitat Public space site-specific assessment dimensions

The Good Public Space Index: “Vikas Mehta” is a Professor of Urbanism at the School of Planning at the University of Cincinnati, USA, His research explores the various dimensions of urbanity through the exploration of place as a social and ecological setting and as a sensorial art, in 2014 he received Award from the Environmental Design Research Association ¹³, in 2012 he developed the good public space index (GPSI).

Place Standard Tool Scotland 2015: This tool was designed in partnership by the Scottish Government, “NHS” Health Scotland, and Architecture and Design Scotland in 2015 ¹⁴, it provides a simple framework to assess the quality of public places that are well established, undergoing change, or still being planned ¹⁵.

Great Public Space Toolkit :It’s an evaluation toolkit created by “NSW” The New South Wales Department of Education, a department of the Government of New South Wales in Australia ¹⁶, The tool draws on research and globally renowned methodologies by Gehl and “Project for Public Spaces PPS” amongst others. ¹⁷ These categories based on “NSW Public Spaces character” principles which stated that Great public spaces have a unique combination of the following elements;

location, locale, purpose, place attachment; location refers to the state of the selected space; its condition, and scale. Purpose refers to space identity and character that reflects in its characteristics and design features, which affect user identity. Place attachment includes all features that affect the user’s sense of belonging, including the type of activities that occurred in the space, space elements that convey a message or a meaning to the user.

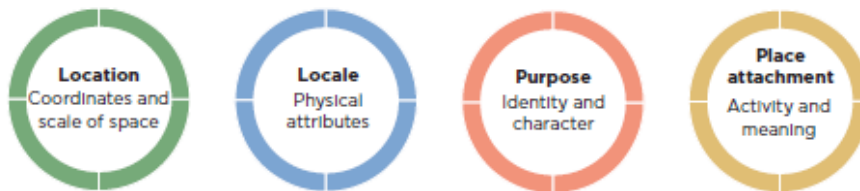


Figure (6)The “NSW Public Spaces character” principles

Table (1) presents the general characteristics of each assessment tool, with a view to highlight the organization and the country of each tool, its year released, its scope (local or global); UN-Habitat assessment tool and space shaper are a global tool that was applied in different countries all over the world, otherwise the project of public space (PPS) their projects were limited in USA, Canada, And Australia¹⁸. Some assessment tools were released for their country such as Place Standard tool (Scotland), and Great Public Space toolkit (Australia), it is worth noting that no such assessment tool was released in the Middle East region or in the Arabic world. Yet, some of the mentioned tools were applied in some Arabian projects such as UH-Habitat, and Space shaper assessment tool¹¹.

Majority of tools focus on the specific site of interest, while few extend the scale to include the space surroundings into consideration; for example, Un-habitat assessment tool categorized its indicators according to scale to “on site” (S) and a lower scale” walkable radius” (R), its five (5) minute walking radius (equivalent to 400-meter distance) hereafter referred to as the walkable radiuses.

Place Standard tool (Scotland) focuses on places that are well established, undergoing change, or still being planned, some indicators were determined for a wider scale than the selected public space (the surrounding environment around the selected space including quality of transportation, and some indicators related to housing and economy), while, the rest of the presented assessment tools focus on a specific public space (on-site scale).

Assessment tool	Year released	Country released	scope	Space scale
PPS	2000	USA	Global	site
Gehl Assessment toolkit (Space shaper)	2007	Denmark	Global	site
UN-Habitat	2012	U.K	Global	site
Place Standard Tool	2015	UN	Global	Walkable-radius
The Good Public Space (GPSI) Index	2013	Scotland	Local	Site and context
Great Public Space toolkit	2021	India	Local	site
		Australia	Local	site

Table (1) the general characteristics of the presented assessment tool

2. Assessment Tools Comparison:

The study conducted a comparison between the seven selected assessment tools according to four main aspects; structure, assessment method, rating method and classification.

2.1. Assessment tool Structure:

Although the assessment tools have been developed for the same goal (enhance the quality of public space), they vary widely in their structure; Most of the selected tools based their indicator on both William white's, and Gehl's principles, but they varied in categorizing and classifying their indicators based on the goal of the tool and thus focus on specific indicators more than others. The following paragraphs explains the differences between assessment tools structure, and the following table (2) determines number of indicators and sub-indicators:

William Whyte, 1979 discussed the success factors of public spaces, he stressed encouraging users to sit and relax in the space, and the importance of space settings that could provide hospitable seating "settable spaces"⁷ and provided place diagram that consists of four main categories: Access and linkage, uses and activities, comfort and image, and sociability.

The project of public space (PPS) was based on Whyte's theory, focusing on social interaction and qualities of space that enhance usability. PPS aimed to enhance place making to strength the connection between people and the places they share, through promoting better urban design, facilitates creative patterns of use, paying particular attention to the physical, cultural, and social identities that define a place and support its ongoing evolution. The tools generally shared the following four qualities: 1. Access and linkage, which refer to space accessibility, both visually and physically. 2. Uses and activities, which is concerned with users' activities in the space, 3. Comfort and image, which includes perceptions about safety, cleanliness, and user's ability to stay in the space. Finally, 4. Sociability refers to social connections and interactions in the space, and user's sense of belonging and attachment¹⁹.

Gehl (1987), discussed the different types of outdoor activities, categorizing them as necessary, optional and social, and the effect of the surrounding environment qualities on using the space He developed 12 indicators to achieve three main objectives; protection, comfort, and enjoyment⁹. In 2000 Gehl Institute established the great public space toolkit, which was committed to creating shared urban systems to deliver global impact on equity, health, and sustainability, where people have control over their health and where inclusive neighborhoods and places are designed to make it easy for people to take meaningful climate action²⁰, the institutes based its toolkit on Gehl's 12 indicators.

"The great public space toolkit" draws on research and globally renowned methodologies by Gehl and "Project for Public Spaces PPS" amongst others. The evaluation form consists of 31 indicators categorized into four questions; "Am I able to get there?", "Am I able to play and participate?", "Am I able to stay?", and "Am I able to connect?"¹⁶

The place standard tool also based their assessment tool on Gehl's indicators. The tool was proposed to help researchers identify users' priorities for a particular place¹³. It consists of 14 questions that cover both the following physical and social elements of a place¹⁴: Moving around, Public transport, Traffic and parking, Streets and spaces, Natural space, Play and recreation, Facilities and amenities, Work and local economy, Housing and community, Social contact, identity and belonging, feeling safe, care and maintenance, and influence and sense of control.

Carr (1992) put forth a holistic and comprehensive description, suggesting that ideal public space is responsive, democratic, and meaningful. He proposed a simple framework to understand the use and sociability of public space including aspects such as: comfort, relaxation, passive engagement, active engagement, and discovery³.

Mehta in 2013, discussed the design attributes of public space to enhance quality and created The Good Public Space index (GPSI), based on Gehl's criteria and "Carr (1992) theory. He focused on the psychological impact of space settings. He used five main objectives to assess quality of public space: achieve space inclusiveness, presence of meaningful activities, enhance safety, feeling comfortable in the space, and user's pleasure ability in the space)²¹.

"Space shaper" toolkits were designed to define user's requirements and interests and to identify both good and bad characteristics of a space and to stimulate new ideas for improvements. Indicators differs according to space's type, each space is assessed according to eight main sections: Access, use, other people, maintenance, environment, design and appearance, community, and user. The toolkit didn't include any sub-indicators as they differs according to space type²².

UN-Habitat assessment tool based its indicators on (Charter of public space) that was composed in 2013 by Biennale dello Spazio Pubblico a unique international rendez-vous for all those who are interested in exchanging notes on how to promote better cities.²³ It consists of 50 principles for public spaces quality, developed a partnership with the United Nations Programme for Human Settlements (UN-HABITAT)²⁴, which is some of its principles are; creating a public space with full consideration for diversity, taking into account the different activities based on communication and urban usage, with respect of safety and security considerations, and the environmental regulations (the micro climate status)²⁴ so, the indicators and categories were much different, the assessment tool guides the user to turn the selected space into five characteristics; "comfort and safe", "use and user", "Accessibility", "Amenities and furniture", "green environment" in order to meet users' needs in public spaces and to enhance their quality. The following table (3) summarize the previous comparison.

Name	The tool based on	Tool objective	The tool focused on
The project of public space “PPS”	William Whyte approach	Place making	Social interactions
Gehl assessment tool	Jan Gehl book in 1987	deliver global impact on equity, health, and sustainability	Social interaction, activities, safety
Space shaper	Not identified	excellence to the design, management and maintenance of the space	Differs according to space function
Great public space index “GPSI”	Jan Gehl 1987 Carr 1992	Enhance design attributes of public space	the psychological impact of space settings
UN-Habitat assessment tool	Charter of public space	promote a sustainable public spaces to ensure good quality of life	All user needs aspects
The place standard tool	Gehl, 1987	identify users’ priorities for a particular place	All user needs aspects
Great public space toolkit	Gehl and “PPS”	Identify user’s ability to use the space	Social interactions and activities

Table (2) comparison between the seven assessment tools

From the comparison presented in table (2), it can be concluded that most of the selected tools were based on Gehl’s, or William Whyte approaches, and majority focused on enhancing user’s quality of life in the public space, by identifying users’ priorities and abilities, providing healthy and sustainable space, enhance space design, management, and maintenance. However, few tools adopt a comprehensive view of users’ needs, except the UN-Habitat and the Place Standard tools, as they cover majority of user needs aspects.

2.2 Assessment Method:

The presented tools varied in the adopted assessment methods (assessment steps, process, and methodology) and in presenting assessment results as follows:

PPS relied on group of experts and specialists through observing, listening to, and asking the people who live, work, and play in a particular space the previously mentioned questions in order to understand their needs and aspirations for that space and for their community as a whole²⁵. The results aim to identify strength and weakness points of the public space.

Gehl institute provided tools for “the public life surveys”, which relied on studying the physical and social elements of the space. It encompasses many forms of data collection; mapping benches, counting cyclists, and conducting interviews²⁶

“Space shaper” works by capturing the perceptions of both the professionals involved in running a space, and the people that use it through a site visit which is an integral part of the assessment process, often led by a group of local expert, it allows the group to discuss the site and get to know each other. The visit prepares the participants (users) to fill out the toolkit’s questionnaire which records individual perceptions of

the space. The results are discussed during facilitated workshops which aim to debate issues of design quality and build a better understanding about how the space works for the different stakeholders ²¹

UN-Habitat assessment tool goes through four phases; the first phase is the pre assessment exercise that provides the user with initial information to get started like an overview of the context as well as information about the demography, history, culture, infrastructure and the social dynamics of the study area, The second phase is “data gathering” aimed at collecting valuable data with and by the community using a variety of tools; observation, site-survey, interviews, exploratory walks, and focus-group discussion. The third phase is analysis whereas the collected data is cleaned and analyzed to highlight the main issues related, the final phase is impact and evaluation through revisiting the site one year after construction and evaluate whether the public space met its ultimate goals and objectives¹¹.

Mehta in GPSI used structured and semi-structured observations across the time of day, week and year, counting, interviews, and user’s subjective rating ²⁰.

The great public space toolkit utilized an evaluation process that consists of many steps, starting from observation, and taking photos, interviews, users counting, down to filling the evaluation form and analyzing the results¹⁶.

	PPS	Gehl’s toolkit	Space shaper	UN-habitat	GPSI	The great public space toolkit	Place standard tool
Collecting community info				√			
Observation/Exploratory walk	√		√	√	√	√	
Taking photos				√		√	
Mapping		√		√			
Counting		√		√	√	√	
Surveying/ filling quest.			√	√	√	√	√
Interviews /Focus group discussions	√	√		√	√	√	

Table (3) comparison between the different assessing methodologies used by the assessment tools

The above table summarizes the comparison between the different assessing methodologies used by the selected assessment tools, the table shows that the place standard was limited to one method of data collection, on other hand UN-Habitat combined various methods of data collection, which may be one of the reasons that make UN-Habitat the strongest and (The place standard tool) the weakest between the compared tools.

2.4 Rating Method and classification:

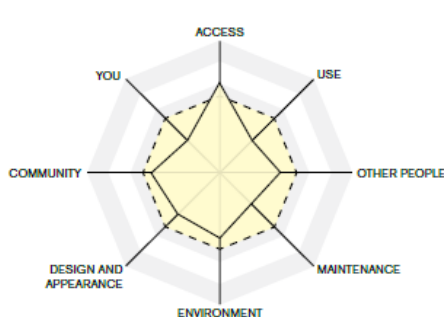
The presented tools varied in rating systems, some relied on identifying the available and non-available quality in the space, and other showed the results in a numerical form as follows;

“PPS” neither proposed any numerical weightings for each variable nor classified them according to their degree of importance or effectiveness on the public space or on user’s satisfaction

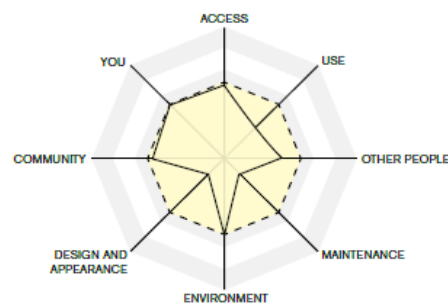
Gehl toolkit also didn’t propose a classification to these indicators or didn’t arrange them according to importance or their impact in the public life, the assessment method was limited to determining the availability and non-availability of the mentioned indicators from the various data collections methods¹ as with “space shaper” tool, the previous three mentioned tools provide general limited impression of the performance of the public space, not rigorous enough to allow comparison of different spaces because it was based on availability and non-availability of the items

UN-Habitat assessment tools’ indicators were categorized into “Mandatory” which are shaded in the following table and “if applicable”, this classification represents the importance which resulted in a difference in the weights of each indicator that provides more advanced and accurate evaluation of the public space than the previous tools.

“Space shaper” consists of eight sections that are equally weighted in terms of their importance, the result are shown through ‘Spider’ diagrams. Each of the eight lines that radiate from the center point represents one of the eight sections from the questionnaire. On each axis, a point has been marked. The more positive people’s responses are towards the space, the further out the point sits on the line. All the points have been joined up and the inside of the shape colored in. The larger the shape, the better the perception of the site, this process is conducted for spaces’ users and the for the experts, So this tool include equally weighted evaluation criteria and a numeric scale of evaluation for each criteria which makes the assessment process more expressive and clear about the quality of the public space.



Figure(3) the perception of users



Figure(4) the perception of experts

¹ Gehl institute, ‘twelve quality criteria’, <https://gehl.institute.org/wp-content/uploads/2017/08/quality-criteria-final.pdf>, 2018, 1–4.

Reference: CABE. (2007). Space shaper: A user’s guide. *The Commission for Architecture and the Built Environment*, 1–21.

In GPSI the rating variables varied in weighting according to their importance in the space, “Mehta” distinguished between variables by giving them weighing “2” or “0.4-0.7” based on the relative weight determined by the author, as the most and less important and influential variables in the space. A scoring criteria was identified. The observer can evaluate the indicator by using 4 point Likert scale system from (0) to (3), that make this tool more expressive and accurate in assessment process.

“The place standard tool” consists of seven circles related to the seven rating points, that results are then presented on a spider diagram, according to the answers, the more the shape will be fuller (reaching the edges of the circle), the space is seen as performing strongly, and vice versa; Where a place is seen as performing poorly, the shape will be smaller, remaining towards the center of the diagram ²⁷

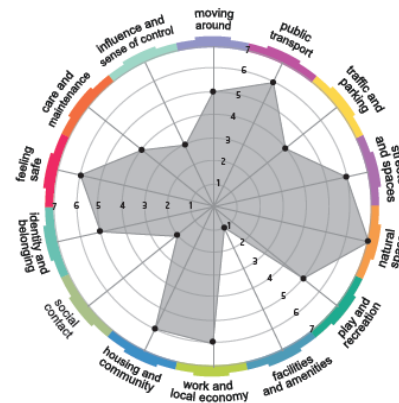


Figure (5) the spider diagram of the place standard tool. Reference: Good, H ²⁷.

The great public scale tool classified the answers to 6 point Likert scale. All the provided indicators are of the same weight, unlike some assessment tools which distinguished between indicators by their relative weight according to their importance and their impact on space users, the following table compare between the selected assessment tools according to; rating method, weighing classification, and tool results.

Name	Degree of accuracy	Weighting classification	Outputs
The project of public space “P.P.S”	Availability and non-availability	Indicators are equal in weighting and in importance	Identify strength and weakness points of the public space
Gehl assessment tool	Availability and non-availability	Indicators are equal in weighting and in importance	Identify strength and weakness points of the public space
Space shaper	7point Likert scale	Indicators are equal in weighting and in importance	Determine issues of design quality
Great public space index “GPSI”	4-point Likert scale	Quality dimension are equal in weighting, but the indicators are different in weighting according to their importance	determine average score for each dimension
Un-habitat assessment tool	3-point Likert scale	Quality dimensions are equal in weighing, but the indicators are divided into (mandatory), and (if applicable).	Determine average score for each dimension

The place standard tool	7-points Likert scale	Quality dimensions are equal in weighing	Spider diagram consists of seven circles related to the seven rating points
Great public space toolkit	6 points Likert scale	Quality dimensions are equal in weighing	Average score for each dimension

Table (4) comparison between the assessment tools according to rating method, classification, and results

According to table (4), the (PPS) tool and Gehl’s tool, measures only presence of absence of design aspects within the space to determines issues of design quality by identifying the strength and weakness points of the public space, so they provide a generally limited scope of the performance of the public space, not rigorous enough to allow comparison of different spaces, this what makes them weak and inaccurate. Space shaper illustrate the assessment in a more advanced method and evaluate according to space type that makes this tool stronger, the other assessment tools are more accurate and identify the assessment process clearly. With respect to weighting of quality dimensions, all the aforementioned assessment tool used equal weighting and importance, except (GPSI), and UN-Habitat, as they differentiates between their indicators in weighting according to their importance which makes these two tools more developed, practical and reliable. .

3. The extent to which these assessment tools cover aspects of human needs:

Jon Lang (2010), proposed a new model of functionalism based on the expanded hierarchy of needs by Maslow, and identified main eight human needs based on Maslow’s hierarchy of needs; Physiological, includes creating a healthy environment provision of comfort factors; Safety, including feeling protected, sheltered, and secured; “social needs” including social interaction and activities in the built environment; Esteem refers to design attributes that enhance sense of personal value and self-worth; Self-Actualization refers to fulfillment of one’s potentialities through intellectual behavior settings, control over life, and full filling social relationship; Aesthetic including formal and symbolic aesthetics, and cognitive needs including creating environment that enhances skills. This study analyzes the selected assessment tools according to the extent to which these tools cover human needs according to the previous definition of Lang’s model of functionalism as follows;

In PPS most of the variables focused on social and aesthetic needs, and few of these variables were concerned with achieving physiological needs (in cleanliness and Greenness), or self-esteem needs (in pride), or cognitive needs (in readable space), there were no variables concerned with self-actualization needs. It’s worth noting that some variables were concerned with the quality of designing the space in terms of space’s connectivity, continuity, and accessibility which helps in enhancing the quality of space usability and achieving users’ needs and the function for which the space was designed.

Gehl toolkit didn't cover all the human needs; the variables were divided into three objectives, one of those objectives concerned with protection which covers the safety and security needs, the next objective concerned with activities and social connection in space which covers the social needs, the last objective (enjoyment) which concerns with the aesthetic needs in providing good design and details and well-chosen material, it's worth mentioning that some variable belongs to the physiological needs such as providing well-protected spaces from weather conditions. Some additional variables related to functional quality were mentioned (accessibility).

While, “space shaper” covered some human needs (social, physiological, aesthetic, etc.), “access” may be related to functions as shown in the following table. Self-actualization, self-esteem, and cognitive needs were not covered.

UN-Habitat assessment tool may be considered as the tool that covered most of the physiological needs in terms of respecting the environmental conditions, and physical comfort conditions in the space. Social, safety, aesthetic needs were covered as well. The accessibility aspect was considered as a vital dimension determining space quality. Also, providing recreational spaces helps in meeting Self-esteem, and self-actualization needs, these two qualities are very similar; the key difference them is that Self-esteem is a reflection of a person’s own evaluation of his or her worth. Self-actualization is the realization or fulfilment of one’s talents and potentialities, both require participating in social activities, feeling sense of belonging, and practice artistic and competitive activities to enhance skills, self-fulfillment²⁸.

“Mehta” sought to cover most of the social indicators that related to user’s diversity and variation in activities that occurred in the space meeting comfort needs (environmental and providing service zones) which related to physiological needs, also, pleasure ability indicators included presence of memorable architecture, buildings’ facades styles and features, elements provide focal points²⁰ which belong to the aesthetic needs. But no indicators were found related to enhancing self-confidence or developing user's cognitive skills.

While, the “place standard tool” gave much attention to social quality in terms of play and recreation, social contact, identity and belonging, it also includes aspects of safety, the physiological quality in terms of facilities and amenities, contact to natural spaces, also self-esteem and actualization in some points related to public space scale, and other related to a wider scale.

”The great public space tool” didn’t cover most of the human needs. It focused on social, safety, and physiological needs but it didn’t give attention to the rest of the needs.

The following table (5) summarize the assessment indicators from the previously mentioned selected assessment tools and categorized it according to human needs, the following table map the coverage of human needs by different assessment tools.

	Indicators	PPS	Gehl tool	Space shaper	UN-Habitat	“GPSI ”	The place standard tool	Great Public Space Toolkit
physiological	Availability and quality of green spaces	√			√		√	√
	Maintenance & cleanliness.				√	√	√	√
	Noise level		√			√	√	√
	Enjoying positive aspects of climate (sun, shade, wind. Etc.)		√		√	√	√	
	Overall comfort				√	√		
	Presence of natural and artificial lighting				√			
	Presence and quality of seating				√			√
	Presence and quality of waste bins				√			
	Presence and quality of water and toilets facilities				√			
	Quality of sensorial Experience (pleasant sound, smell, views)				√			
	Quality of air in terms of co2 and particulate				√			
	Presence of water bodies (rivers, lake, etc.)				√			
	Availability of food within					√	√	√
	Total number of indicators	1	2	0	11	5	5	5
safety	Protecting pedestrian from traffic accident		√			√	√	√
	Allow for passive surveillance		√			√		
	Well lit		√			√	√	√
	Presence and quality of signage and emergency items				√			
	Security from crime				√	√	√	√
	Presence of surveillance cameras, security, guides. Etc.				√	√		
	Presence of lockable gates, and fences					√		√
	Total number of indicators	0	3	0	3	6	3	4
social	Interactive, suitable, useful space	√				√		√
	A convenient walkable and settable space	√				√		
	Ability to stand, play		√			√		
	Activity diversity			√	√	√	√	√
	User diversity			√	√	√	√	√
	Presence of social interaction				√		√	√
Total number of indicators	2	1	2	3	2	3	3	
Es	Feeling with pride	√			√	√		

	Presence for spaces for social connections and activities	√			√	√	√	
	Total number of indicators	2	0	0	2	2	1	0
Cognitive	Readable space	√						
	Total number of indicators	1	0	0	0	0	0	0
Aesthetic	Create welcoming, friendly space	√		√		√	√	√
	Create fun, active, vital space	√				√	√	
	Create Spiritual, Charming, Attractive, historic	√				√	√	√
	Space proximity and complexity	√				√		
	Positive sensory experience (good details, material, view)		√	√			√	
	Design quality and aesthetic value of furniture, façades			√	√			
	Presence of remarkable buildings/physical landmarks				√	√	√	√
	Presence of cultural aspects/historical events defining the identity of the space				√		√	√
	Total number of indicators	4	1	3	3	5	6	4
Self-actualization	Presence of inclusive recreational structures for outdoors activities				√		√	
	Quality of recreational spaces in terms of dimensions, design and location for children and disable people				√		√	
	Total number of indicators	0	0	0	2	0	2	0
Additional	Space accessibility	√	√	√	√	√	√	√
Total number of aspects covers		12	8	6	25	21	21	16

Table (5) the common assessment indicators categorized according to human needs

As shown in the previous table (5), there are many common indicators between the seven assessment tools, but it's worth noting that space accessibility was the only indicators that appeared in every tool, some tools considered accessibility as a separated category such as UN-habitat. Some assessment tools focused on assessing social indicators and aesthetic indicators (such as Gehl's toolkit, and PPS) others tried to cover most of human needs with a balanced ratio. According to number of indicators cover human needs for each assessment tool; UN-Habitat, GPSI, the place standard tool covers large number of indicators between the seven selected assessment tools.

The following table (6) estimates the ratio of covering human needs for each assessment tool according to the number of indicators, the percentage was calculated

according to number of indicators related to each human needs by the total number of indicators in the assessment tool.

	PPS	Gehl tool	Space shaper	UN-Habitat	“GPSI”	The place standard tool	Great Public Space Toolkit
physiological	6%	21.4%	12.5%	43.5%	16.6%	17%	22.5%
safety	3%	14%	12.5%	21.5%	22.2%	4%	23.3%
social	45%	40.4%	37.5%	8.6%	30.5%	39.5%	23.3%
Self-esteem	3%	0%	0%	1%	0%	2.8%	3.3%
cognitive	3%	0%	0%	0%	0%	0%	0%
aesthetic	36%	21.4%	25%	14.4%	25%	25.7%	10%
Self-actualization	0%	0%	0%	1%	0%	2.5%	3.3%
additional	3%	2.3%	12.5%	4%	5.5%	5.7%	3.3%

Table (6) the estimated ratio of covering human needs for each assessment tool according to the number of indicators

From the previous table (6), the assessment tools showed a wide coverage of social and aesthetic indicators with a partial coverage of safety indicators in (space shaper), and physiological needs. That makes self-actualization, and self-esteem needs are very hard to be covered in the urban context according to space’s type and the type of activities practiced within the space. Also it’s worth noting that “PPS” assessment tool are the only tool that cover the cognitive needs through assessing the ability to read the space “creating a readable space”. These ratios are illustrated clearly in the following spider diagram.

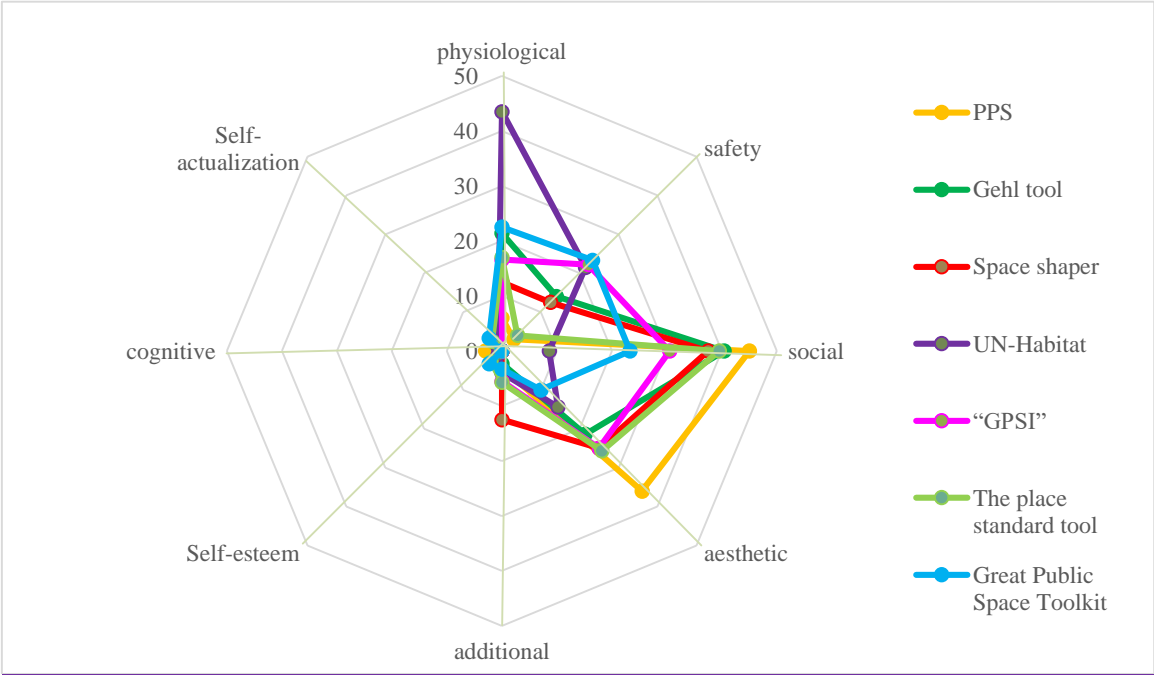


Figure (5) a spider diagram shows the estimated ratio of covering human needs for each assessment tool according to the number of indicators

the previous diagram illustrated the differences in The extent to which these assessment tools cover aspects of human needs, Gehl and P.P.S focused on social and aesthetic needs and didn't give much attention to safety needs as the others, (space shaper) combined physiological, safety, social, aesthetic, and additional needs, focused on social needs and didn't give much attention to cognitive, self-actualization, and self-esteem needs, place standard tools covered the same needs, UN-habitat focused in a big way on the physiological needs beside safety, aesthetic, social needs was the least, on other hand (Great public space tool GPST) covered most of the human needs except cognitive needs but focused on safety, social, and physiological needs, there is lack in covering cognitive, self-actualization, and self-esteem needs in all the selected assessment tools, that may be because of differences in users' types and requirements due to public space's type, scale, and the type of activities practiced within the space

Conclusion:

Quality of designing public spaces play an essential role in developing individual wellbeing, many studies discussed the quality of public spaces in terms of achieving users' needs, such as Lang's model of functionalism that was based on the expanded hierarchy of needs by Maslow, which the study mainly followed. Seven global assessment tools were selected for a critical review of their general characteristics, structure, assessment method, and rating method and classification. The differences were presented in their assessing method and data collection, and their indicators, and the human need which the tools focused on. Another difference was that the assessment tool criteria differ according to the theory and urban approach which they follow; William Whyte focused on social interaction and qualities of space that enhance usability, which is what P.P.S and the great public space toolkit were based on. Also, Gehl discussed the different types of outdoor activities and aimed to achieve three objectives; protection, comfort, and enjoyment that what Gehl's toolkit and (space standard tool) classified their indicators on, otherwise, Stephen Car focused on social activities and the aesthetic values in the space on which Mehta focused his indicators in GPSI.

Finally, (Charter of public space) didn't focus only on the social aspect, but on many other objectives such as creating a public space with full consideration for diversity, taking into account the different activities based on communication and urban usage, with respect of safety and security considerations, and the environmental regulations (the micro climate status), therefor UN-habitat tool focused on covering the physiological needs widely beside covering the other needs.

The aim of the review was to clarify differences between these tools and highlight different methodologies of assessments, and present the extent to which these tools meet human needs through their indicators.

The study compared the selected assessment tools according to assessment methods and presented that most of the assessment tools combined different types of assessing methods but the place standard was limited to one way of data collection, on other

hand UN-Habitat combined various methods of data collection as shown in table (3), that may be one of the reasons for judging the tool by strength and weakness.

The study compared the selected assessment tools according to rating methods and classification, and presented that the quality dimension in all the assessment tool are equal weighting and importance except (GPSI), and UN-Habitat differentiates between their indicators in weighting according to their importance which makes these two tools are the strongest.

The study provided a mapping of different tools coverage of the seven aspects of human needs in table (5) and identified aspects that has gained common attention from the seven assessment tools, the comparison showed a wide range of coverage of social and aesthetic aspects more than the other aspects as shown in the tables (6), the study concluded that social and aesthetic aspects are the most agreed upon in the quality of public space, then comes the physiological aspects, indicating that the main purpose of the public space is social interactions and practice of activities and enjoyment of space aesthetics.

Finally, The study found that UN-Habitat, and GPSI are the assessment tools that covers most aspects of human needs and are thus considered to be the most comprehensive. It is recommended that any new assessment tool that aims to comprehensively cover users need to be based on these two assessment tools.

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