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Evaluation of visual pollution in urban squares, using SWOT, AHP, and QSPM techniques (Case study: Tehran squares of Enghelab and Vanak)

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ABSTRACT: Visual pollution, observed in urban areas, makes human beings suffer indirectly from mental distress and illnesses in long term. We are daily confronted with a variety of advertisement pictures in city squares and review them in our minds. But we may not be aware of the fact that such a visual scramble leads to mind distraction, decreasing mental concentration. The present study applies the techniques of SWOT and QSPM to identify and introduce the most influential factors, related to visual pollution, in internal and external environment of Tehran, comparing the rate of visual pollution in both Vanak and Enghelab squares. Accordingly, in SWOT matrix, strengths, weaknesses, threats, and opportunities in these squares have been investigated and, using Expert Choice, AHP method has been applied to weight them. SWOT as an analytic instrument can be used for evaluation purposes in QSPM system. Finally, using the Quantitative Strategic Planning Matrix (QSPM), the selected strategies have been prioritized. The results of the study indicate that Vanak Square has an invasive strategy and Enghelab Square, a conservative strategy. Aided by QSPM matrix, the study has offered eight prioritization strategies, introducing the best possible strategy for these squares. Regarding visual pollution, Vanak Square has a better position than Enghelab square.

Keywords: AHP, QSPM, SWOT, visual pollution.

INTRODUCTION

Throughout the history, either people have shaped their own living environments or environments have formed their communities. In this cycle, social lives and their contextual spaces may have undertaken certain changes. After 1950s and particularly after Industrial Revolution, unplanned and fast urbanism as well as continuous population growth caused many changes and all of these factors influenced the environment where people lived (Yilmaz & Sagsöz, 2011).

Normally establishing buildings and urban space items are referred to streets and squares as well as other public places, owned by municipality. Living in marginal buildings has disturbed the harmony, formed by city-building factors. These various complexities of urban spaces and different degrees of their users have made cities sensitive to and negatively influenced by different kinds of pollutions. Visual pollution damages human eyesight. Under the influence of human lifestyle and economic status, spatial directions and psychological aspects have suffered a lot (Purice, 2013). One of the most significant visual pollution indices on cities is shadows. Shadows or

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uniformed black paintings are observable shadows of cities' physical structures and historical masses. When we talk about environment, the first thing that strikes our mind is water, air, and noise pollution. But one of the pollutions which has recently attracted attention, but has been ignored compared to other kinds of pollution, is visual pollution (Yilmaz & Sagsöz, 2011). Since visual comfort is one of important and basic components of safe man-made environments (human beings consider cities as their own homes), home should have desirable qualities to satisfy security- and peace-related requirements of its residents. Furthermore, a city should be a warm and intimate place in order to provide good conditions of life. Also, visual comfort is one of the factors that should receive attention in order to create suitable urban landscape. Visual comfort components include color, brightness, and environmental quality. Undesirable application of colors and lack of proper lighting have led to some kinds of pollution in urban environments, related to color, brightness, and façade (Salehi, 2006).

Based on European Planning Chart in 2012, nowadays professional planning is scarcely coordinated with urban spaces (Voronych, 2013). Visual pollution may be considered as the overall messy units, observed usually in natural or man-made environments, indirectly having bad effects on human minds (Yilmaz & Sagsöz, 2011). Reasons behind visual pollution include wrong decisions, lack of legal requirements, lack of control, and incompatible applications with performance, not to mention lack of education and culture (Yilmaz & Sagsöz, 2011). Visual pollution may be reflected throughout the city including local spaces and buildings. Environments in which compact buildings without green spaces or buildings, not compatible with environment, create such scenes which would result in visual pollution. Additionally, mobile waste baskets, traffic signs, direction signs, large advertisement signs at cities' exit and entrance roads, electrical power cables and poles, building transformers, telephone cables, installed air-conditioners on the external building walls, and satellite antennas can also result in visual pollution.

People always interact with their environments. As a matter of fact, there is some kind of balance between human being and his environment; however, the intensity of such balance is sometimes at such high levels, causing distraction, reluctance and adaptability problems, behavior disorders, pessimism, and increased psychological illnesses in human beings (Bodur & Kucur, 1994). Therefore based on previous investigations, there is statistical correlation between frequency of deviations as well as behavioral disorders, on one hand, and different types of visual and environmental pollutions, on the other. The study hypothesizes that behavioral pollution tends to spatial and time-based adherence to environmental pollutions, including visual pollution. Currently due to scarce urban planners' attention, lack of comprehensive programs for urban spaces, and unhealthy city growth as a result of increased population growth, the issue of visual beauty is receiving less attention than ever, which has caused visual disorders in cities. Given the political, cultural, social, and geographical features; social status of its residents; forgotten principles of reconstruction, unreasonable interventions in textures of the city; and indifference on the part of relevant authorities, Tehran has undergone decreased environment quality in recent decades.

With regards to visual comfort and urban landscape as well as determination of visual pollutions, there have been widespread researches, such as the work of Kalen (2005) in a book titled "Excerption of Urban Landscape", also translated into Persian. It deals with urban landscape as well as the art of integrating visual and structural elements into constituting components of the city

which shape urban environments. Furthermore, Salehi (2006) in an article titled "Components of Visual Comfort and its Role in Environment Improvement" investigated the visual component in evaluation of environment quality. Voronych (2013) in "Visual Pollution in Urban Space of El Vivo City" investigated the relation between increased motorways and visual pollutions. Chmielewski et al. (2016) in "Measuring Visual Pollution by Outdoor Advertisements in an Urban Street, Using Intervisibility Analysis and Public Surveys" focused on measuring visual pollution by OAs (banners and billboards).

The present paper has dealt with structural improvement of Vanak and Enghelab squares in terms of environmental qualities along with improvement of local religious identities through visual comfort components, using the techniques of QSPM and SWOT for its evaluation.

Visual pollution in urban area

City is the complete embodiment of communities on earth, which is realized through lots of readable signs for all kinds of residents. In various degrees, these signs have implications which realize the relations between human being and his realm. Based on an established framework of collective behavior of individuals in an environment, they have a symbolic role in history, information, guidance, rules, or a combination of two or more of these. Primary understanding of human beings from spaces has been naturally visual. People infer their environment and in fact their home as a collages of pictures. The quality of visual environment has been considered under subcategory of various types of consciousness. The pictures that we see are blocked with visual garbage more or less. Such a problem has been observed in majority of contemporary big cities (Voronych, 2013). Visual pollution is a compounded effect of clutter, disorder, and excess of various objects and graphics in the landscape, such as outdoor advertisements (OAs), street furniture, lighting features (Falchi et al., 2011; Chalkias et al., 2006), vegetation characteristics (Ulrich, 1986; Lamp & Purcell, 1990; Ribeiro & Barao, 2006), and other objects. In special cases of visual pollution, the overall design of the pollutant may be classified as the following:

- Media devices and various advertisements (billboards, posts, signs and works in additions to flags, etc.)
- Vehicles passages (crowdedness, parking lots, and even bicycles in busy places)
- Contemporary and flat architecture (details, entertainments, politicians, clergies, and oriented events)
- Visual barriers (protective rails, transfer architectures, and so on).
- Population (business, education, and tourism) (Fig. 1).

Pollutions are result of unfair and excessive consumption, making it one of the important issues, regarding spatial planning (Voronych, 2013).

MATERIAL AND METHOD

This research is a descriptive-explanatory one, using methods for collecting data which included document and library-based studies, viewpoints, opinions, and definitions. Also, using field-based approaches (questionnaire, observation, interview, and field-based surveys), the required data were collected and processed in SPSS. Then, according to a statistical test of Khi^ 2, the data were analyzed and the assumptions, examined. The sample volume in this study was about 40 questionnaires, distributed randomly in two study places. Finally, using AHP technique and its related software (Expert Choice), the threats, opportunities, weaknesses, and strengths of Vanak and Enghelab squares were weighted and ultimately, based on SWOT and QSPM approaches, they were analyzed.

The squares under investigation

1. Enghelab square

Enghelab square is one of Tehran Squares, located at the intersection of Enghelab, Kargar, and Azadi streets, being one of the main squares of Tehran. Due to its central position, lots of people pass this square daily. Most of Tehran bookstores and publication centers are located in Enghelab square, along with Bahman Cinema in the northeastern, Shahr-e-Tamasha and Pars Cinema in the southwestern, and food market in the southern part of this square.

2. Vanak square

Vanak is a neighborhood located at the north west of Tehran, in District 3 of the city's municipal classifications. Deh Vanak is one of the oldest and most verdant neighborhoods of northern Tehran. Currently this region is south of Niayesh and north of Chamran Highway. It has retained its traditional mood, meaning that all of houses there are in form of detached houses (Fig. 2).

Fig. 1. Visual pollution in urban area

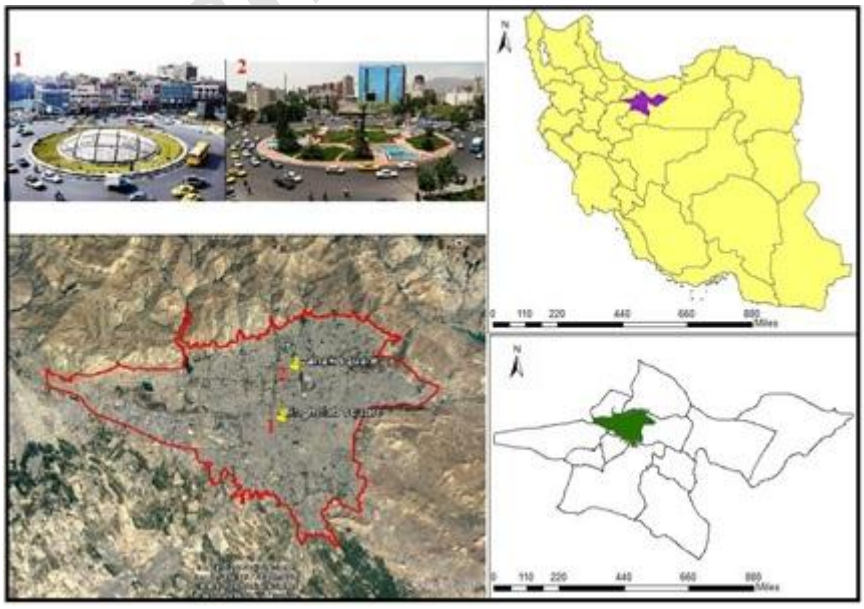

Fig. 2. Location of the study area

Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process is considered a versatile and powerful decision-making technique for complex situations, which has contradictory and various measures (Saaty, 1994). It was invented by Iraqi scholar Tommy al Saaty in 1970s (Ghodsipour, 2008). In decision-making process, this pattern is based on pair comparisons. The value-based foundations of the analyzer is mixed with available information about the alternatives with a set of measurement priorities created for the evaluation process.

In the process of measuring capabilities, based on AHP technique, once the necessary criteria along with their importance coefficients are determined, the process of evaluation is performed, according to each criterion's competence. The process is performed on three stages of hierarchy formation, which is the most important part of AHP technique where the effective criteria in evaluation process are determined. The importance of criteria coefficients is implemented through experts' preference judgments, pair comparison method, and examination of the judgments' compatibility, based on the compatibility rate, which should be less than 0.1 in order that a judgment can be considered acceptable (Dey & Ramcharan, 2008).

In the present study, at first the criteria effective in visual pollution management were identified. In the next stage, the weight of each criterion was calculated. There are many approaches to determine importance coefficients of the criteria, the most common of which is pair comparison, provided by Saaty, and considered a suitable approach to weight criteria in AHP system, in which the criteria are measured and weighted via a software program, called Expert Choice.

The current study used experts' ideas in Planning and Environmental Management to analyze the criteria. Tables 1, 2, 3, and 4 show the weights of the criteria in visual pollution assessment.

SWOT and QSPM methods

SWOT is the abbreviation of four analytical factors, namely Strengths, Weaknesses, Opportunities, and Threats. As such the analysis of strengths and weaknesses is performed in internal environment, while that of opportunities and threats are performed in external one (Kajanus et al., 2012). Internal factors have been evaluated, using IFE matrix, whereas the evaluation of external factors employs EFE matrix. At this stage, the final score, obtained from each of these matrices, reveals the status of organization, relative to internal and external factors of visual pollution. In the next stage, using a list of strengths, weaknesses, opportunities, and threats of the major visual pollutions of the squares, SWOT system was created. Afterwards internal strengths were compared with external opportunities in order to create SO, and internal weaknesses were compared with available opportunities outside the organization in order to create ST Strategy. By comparing internal weaknesses with external threats, WT strategy was determined. Finally, using evaluating matrix of internal and external factors as well as the results of both SWOT and QSPM matrixes, the selected attractiveness and priority strategies were determined.

Formation of internal and external factors evaluation (IFE) matrix

Once the internal factors were investigated, the most important factors were listed. The number of these factors should be within the range of (10, 20). These factors should include the most important strengths and weaknesses of the organization. Formation of this matrix involves the following steps (Karbasi et al., 2008):

1. At first, the strengths and weaknesses are written.
2. To each of these factors a coefficient is assigned (ranging from 0 as non-important to 1 as very important)
3. Each factor is given a number from 1 to 4. Scores 1, 2, 3, and 4 represent basic weakness, little weakness, strength, and

very powerful strength for the aforementioned factors, respectively.

4. To determine the final score of each of the factor, its coefficient is multiplied by its score.

5. The sum of final scores of all factor is calculated and the final score of the organization is determined.

6. In the matrix of internal factors evaluation, if the final score is above 2.5, the strengths will surpass the weaknesses and if the final score is below 2.5, the strengths will be fewer than the weaknesses

RESULTS AND DISCUSSION

Tables 1 and 2 list the most important external and internal factors. Table 1 gives internal factors of Tehran's visual pollution management in Vanak Square, compared to those of Enghelab Square, presenting them in a matrix of internal factors' evaluation (Tables 1 and 3). The strengths and weaknesses are graded as follows: 4= strong strength, 3= weak strength; 2= low weakness, and 1= severe weakness. According to the table, the highest strength is 0.0215 and the lowest one, 0.057. As for the weaknesses, the highest weight is 0.154 and the lowest one, 0.025. Afterwards, by multiplying the weight in the amount of degree, the weight-based score is obtained. By summing up the weight scores, the total score, related to the internal factors, is obtained, thus the score average is 2.5 and its maximum amount, 4. Now, if this number is above 2.5, from the perspective of internal factors it means that visual pollution is in a desirable condition. According to the table, the sum of these scores is 2.459. QSPM uses the weights, attributed to these factors. Then using external factor evaluation in matrices 2 and 4, the most important opportunities and threats, related to Vanak and Enghelab Squares from the perspective of visual pollution have been presented. The opportunities and threats are graded as follows: great opportunity is equal to 1 and 2, while weak opportunity is 3. Also, severe threat is 1 and weak threat, 4. These factors have been presented quantitatively to avoid any misunderstanding and perceived judgments. Finally, the related total weight is obtained. If it is above 2.5, it means the organization has used the external opportunities properly and has avoided the potential threats. The highest weight which may be attributed to the overall set of factors is 4. As it can be seen, the highest opportunities and threats are 0.248 and the lowest ones, 0.017. The sum of this amount is 3.402. Afterwards, QSPM uses the matrix of internal and external factors evaluation, and, based on their importance in improving organization success, a weight is assigned to each factor. The same process has been performed for Enghelab Square.

Table 1. Internal factor evaluation matrix for Vanak square

Strengths		**Weight**	**Score**	**Weighted score**
S1	Corridor to green space	0.215	4	0.86
S2	Short Buildings	0.076	4	0.228
S3	wall paintings on buildings	0.057	4	0.228
S4	existence of green space	0.148	2	0.296
S5	Low mass of cars and human beings	0.067	3	0.201
S6	Low amount of human population	0.052	3	0.156
S7	Decreased advertising Tableaus	0.123	2	0.246
Weakness				
W1	Lack of prominent elements	0.154	2	0.308
W2	Weak access	0.025	1	0.025
W3	Excessive use of decorative devices	0.027	1	0.027
W4	Lack of pointwise green space	0.056	2	0.112
	Total internal factors	1		2.687

Table 2. External factor evaluation matrix for Vanak square

Opportunities		**weight**	**Score**	**Weighted score**
O1	Increased Visual Comfort	0.086	3	0.258
O2	Lower view blockage and installment of air-conditioner systems	0.228	4	0.912
3O	Increased spatial feelings	0.096	3	0.288
O4	Higher landscape beauty	0.037	2	0.074
O5	Decreased human and car encounters	0.098	3	0.294
O6	Lower air temperature and pollution	0.247	4	1.096
O7	Observation of space	0.098	3	0.294
Threats				
T1	Confusion	0.038	2	0.076
T2	Deformation of Space	0.017	1	0.017
T3	Disturbing traffic order	0.017	1	0.017
T4	Less flexibility	0.038	2	0.076
T5	Total external factors	1		3.402

Table 3. Internal factor evaluation matrix for Enghelab square

Strengths		**Weight**	**Score**	**Weighted score**
S1	The existence of prominent elements	0.200	2	0.400
S2	Presence of Subway station	0.200	2	0.400
S3	Presence of retailers	0.114	2	0.228
S4	Presence of causes for collective memory like Bahman Cinema	0.112	3	0.336
Weakness				
W1	No spatial feeling	0.063	1	0.063
W2	Lack of green spaces	0.049	2	0.098
W3	Lack of open spaces	0.044	2	0.088
W4	Existence of billboards	0.039	2	0.078
W5	Human and car traffic	0.038	2	0.076
W6	Lack of viewing corridors to open spaces	0.033	1	0.033
W7	Lack of appropriate urban furniture	0.029	1	0.029
W8	Lack of brightness	0.025	1	0.025
W9	View blockage	0.019	1	0.019
W10	Presence of high-rise buildings	0.018	1	0.018
W11	Existence of false Jobs	0.016	2	0.032
	Total internal factors	1		1.923

Table 4. External factor evaluation matrix for Enghelab square

Opportunities		**Weight**	**Score**	**Weighted score**
O1	Creating ability in the presence of people	0.247	2	0.494
O2	Use of public transportation	0.247	2	0.494
O3	Increased control of observer over the space	0.131	3	0.393
O4	Increased place feeling	0.072	2	0.144
Threats				
T1	Lack of observer control over the space	0.066	1	0.066
T2	Car and human being encounters	0.043	2	0.086
T3	Lack of appropriate air conditioning and the stability of polluted air	0.034	2	0.068
T4	Lack of landscape beauty	0.059	2	0.118
T5	Confusion	0.045	2	0.090
T6	View blockage and disturbed visual comfort	0.028	2	0.056
T7	Lack of financial security	0.031	1	0.031
		1		2.040

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(Continue) Table 4. External factor evaluation matrix for Enghelab square

Strengths		**Weight**	**Score**	**Weighted score**
S1	Road to green space	0.215	4	0.86
S2	Low-rise Buildings	0.076	4	0.228
S3	Wall paintings on buildings	0.057	4	0.228
S4	Presence of green spaces	0.148	2	0.296
S5	Lower car and human density	0.067	3	0.201
S6	Low amount of human population	0.052	3	0.156
S7	Fewer advertising signs	0.123	2	0.246
Weakness				
W1	Lack of prominent elements	0.154	2	0.308
W2	Weak access	0.025	1	0.025
W3	Excessive use of decorative devices	0.027	1	0.027
W4	Lack of point-wise green spaces	0.056	2	0.112
	Total internal factors	1		2.687

Table 5. SWOT analysis matrix for Vanak square

Strategies	**Opportunities**	**Threats**
	SO strategies	**TS strategies**
Strengths	1. Providing the opportunity of people gathering with emphasis on significant elements (S_1O_1) 2. Increasing the use of public transportation with emphasis on the subway station (S_2O_2) 3. Increasing spatial feelings with emphasis on collective memory elements (S_4O_3) 4. Increasing space liveliness with the emphasis on retailers (S_3O_4)	1. Creating rhythm in space by using low-rise buildings (S_1T_3) 2. Regulating traffic through low-density population (S_5T_2) 3. Increasing the readability of the environment by means of wall paintings (S_3T_1) 4. increasing the flexibility by means of making green spaces (S_4T_4) 5. Eliminating the confusion through use of low-density advertising signs (S_7T_1)
	WO strategies	**WT Strategies**
Weaknesses	1. Improving landscape beauty in order to decrease low-density green space (W_4O_3) 2. Granting more access by lowering encounters with cars and human beings (W_2O_5) 3. Decreasing view blockage by taking decorative objects away (W_3O_2) 4. Increasing visual comfort and space view via increased significant elements (W_1O_7)	1. Increasing observational control over space by improving brightness and constructing low-rise buildings (T_1W_8) 2. Granting more access and decreasing the accidents through improvement of human and car-based traffic (W_5T_2) 3. Establishing appropriate air conditioning through improvement of the green spaces (W_2T_3) 4. Increasing landscape beauty by improving the routes to open space (W_6T_4)

Table 6. SWOT analysis matrix for Enghelab square

	SO strategies	**TS strategies**
Strengths	1. Providing opportunity of people gathering with emphasis on significant elements (S_1O_1) 2. Increased the use of public transportation with emphasis on subway station (S_2O_2) 3. Increased place feeling with emphasis on collective memory elements (S_4O_3) 4. Increased liveliness of space with the emphasis on retailers (S_3O_4)	1. Creating rhythm in space by using short buildings (S_1T_3) 2. Regulating traffic using low-density population (S_5T_2) 3. Increased readability of environment using wall paintings (S_3T_1) 4. increased flexibility through creating green space (S_4T_4) 5. Eliminating Confusion confusion through use of low-density advertising tableaus (S_7T_1)
Weaknesses	**WO strategies**	**WT Strategies**
	1. Increased landscape beauty to decrease low-density green space (W_4O_3)	1. Increasing observational control over space by improving brightness and creating short buildings (T_1W_8)
	2. Reinforcement of accesses through decreasing car and human beings encounters (W_2O_5)	2. Increased accesses and decreased accidents by improving human and car-based traffic (W_5T_2)
	3. Decreased view blockage by decreasing decorative objects (W_3O_2)	3. Creating an appropriate air conditioning by improving green space (W_2T_3)
	4. Increased visual comfort and space view through increased significant elements (W_1O_7)	4. Increased landscape beauty through improving corridor to open space (W_6T_4)

Forming SWOT matrix

SWOT Matrix has many applications among managers and strategic planners (Abya et al., 2015;Abbasi et al., 2013, using vital internal and external factors to create strategies that need paying attention to. Generally, this matrix links internal and external factors and is used as a basis for potential strategies (Tables 5 and 6). This analytic instrument develops strategies to be used later in QSPM system. Another application of SWOT is to compare key external opportunities and threats with internal strengths and weaknesses.

Results from the matrix of internal and external factors and these models lead to strategies, demonstrated in the following diagrams (Diagrams 1 and 2).

QSPM

This system is an analytic technique, defining superior strategies (David, F.A, 2009 & 1985). Respectively, the columns on the left-hand side are the names of internal and external factors and their weights, which are exactly inferred from the matrix of internal and external factors of the organization. In the next columns, the mentioned strategies in SWOT matrix, namely SO1, SO2, WO1, WO2, ST1, ST2, WT1, and WT2, are placed in 8 columns. Each column includes AS (Attractiveness Score) and TAS (Total Attractiveness Score). The latter is obtained by multiplying the weight in Attractiveness Score, which can take the values of 1, 2, 3, and 4. Value 1 represents the lowest and value 4, the highest attractiveness. However, some strategic factors may not have any appeal for strategies, in which case, we should not consider any attractiveness score for that factor. It should be emphasized that ASs should not be based on guess, rather they should be precise, reasonable, and justifiable (Ghosiyan et al., 2015). Finally, TASs, related to each strategy, should be collected. Each strategy with the highest score has the highest priority for the organization (Tables 7, 8). This matter is important in the process of strategy selection.

Diagram 1. SWOT analysis diagram for Vanak square's visual pollution

4 Improvement of environment conditions by using capabilities Conservative position	Use of capabilities to use opportunities Invasive position
2.5 Less weaknesses and avoidance of using opportunities Defensive position	Improvement of internal systems by means of external opportunities Competitive position
1 2	2.5 3 4

Diagram 2. SWOT Analytic Diagram in Enghelab square's visual pollution

Improvement of environmental conditions by using capabilities Conservative position	Utilization of capabilities for the use of opportunities Invasive position
2.5 Decreased weaknesses Defensive position	Improvement of internal systems by means of external opportunities Competitive position
1 2	3

Table 7. QSPM matrix for Vanak Square

Strategic factors	Weights	SO1		SO2		WO1		WO2		ST1		ST2		WT1		WT2	
		AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS
Strengths																	
Presence of observational corridor to open spaces		4	0.215	3	0.86	0.645											
Low-rise building		1	0.07	4	0.076	0.304					4	0.304					
Existence of wall paintings on building			0.057					0.592							2	0.296	
Existence of green spaces	0.148	2	0.296	3	0.444	4				2	0.296			2	0.296		
Low density of cars and human	0.067			2	0.134	1	0.067	4	0.268			4	0.268	1	0.067	3	0.201
Low population	0.052	3	0.156	2	0.104	1	0.052	4	0.208	2	0.104	4	0.208	1	0.052	3	0.156
Fewer advertising signs	0.123	2	0.246					2	0.246	2	0.246			2	0.246	1	0.123
Weaknesses																	
Lack of significant elements	0.154	1	0.154					1	0.154	3	0.462			4			
Weak access	0.025							3	0.075	1	0.025	3	0.075			4	0.1
Excessive use of decorative objects	0.027	2	0.054			3	0.081	1	0.027					1	0.027		
Lack of green spaces	0.056	3	0.168	2	0.112	3	0.168	1	0.056	2	0.112	2	0.112	2	0.112	2	0.112
Opportunities																	
Higher visual comfort	0.086	4	0.344	3	0.258	3	0.258	4	0.344	3	0.258	3	0.258	3	0.258	3	0.258

Table 8. QSPM matrix for Enghelab Square

Strategic factors	Weights	SO1		SO2		WO1		WO2		ST1		ST2		WT1		WT2	
		AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS	AS	TAS
Decreased view blockage and establishment of air conditioning systems	0.228	3	0.648	4	0.912	1	0.228	2	0.456	2	0.456	1	0.228				
Increased spatial feeling	0.096			2	0.192	2	0.192	1	0.096	1	0.096	1	0.096	3	0.288	3	0.288
Increased landscape beauty	0.037	3	0.111	2	0.074	4	0.148	3	0.111	2	0.074	3	0.111	1	0.037	1	0.037
Decreased car and human encounters	0.098	2	0.196	2	0.196	1	0.098	4	0.392			2	0.196			3	0.294
Deteriorated weather temperature and air pollution	0.247	1	0.247	2	0.498	2	0.498	3	0.741	3	0.741	3	0.741			2	0.498
Space observation	0.098	3	0.294	3	0.294	2	0.195	2	0.195	3	0.294	1	0.098	3	0.294		
Threats																	
Confusion and destruction of environment readability	0.038			2	0.076	2		2	0.076	2	0.076	2	0.076	4			
Destruction of space form	0.017	2	0.034			1	0.017	1	0.017	1	0.017			3		1	0.017
traffic disorder	0.017	2	0.034			1	0.017	2	0.034			3	0.051			3	0.051
Decreased flexibility	0.038	2	0.076	1	0.038	1	0.038	1	0.038	1	0.038	2	0.076	3	0.114	1	0.038
Total			4.03		4.281		2.64		3.53		3.59		2.59		2.08		2.17

CONCLUSION

The aim of this study was to investigate SWOT analysis in the process of managing visual pollutions, related to Vanak and Enghelab Squares in Tehran, Iran. Accordingly, the location of these squares was analyzed and SWOT factors and matrix were investigated. QSPM makes the decision-makers think more about the weights of SWOT factors and analyze the situation more precisely and deeply than what SWOT performs on its own. Since QSPM is suitable almost for every situation, applicable for SWOT, to some extent weaknesses of SWOT would be alleviated by QSPM. Based on performed analyses and the evaluation matrix of internal and external factors of Vanak square, the obtained score for internal factors was 2.535 and the score obtained for external factors, 3.402. Therefore, based on principles of strategic management, the strategic position of Vanak square was in invasive area. Based

on examination of the scores of internal factors, it was found that the research score was above 2.5. Accordingly, we concluded that the strength points of this factor were more than its weaknesses and the organization had a good status in the field of research. Also by examining the scores of external factors, we found that the score of research factor was greater than 2.5. Then, we concluded that opportunities of this factor were more than its threats, dominating them. Regarding the evaluation matrix of internal and external factors in Enghelab square, the obtained score of internal factors was below 2.5; therefore, weaknesses dominated the strengths and since the obtained scores of external factors were above 2.5, opportunities dominated threats, making this square's position conservative.

Among the 8 important strategies of visual pollution management in Vanak Square, the strategy of establishing air conditioning systems, while maintaining low-rise buildings, with an attractiveness score of 4.281 and the strategy of increasing visual comfort with emphasis on presence of routes to open spaces with an attractiveness score of 4.03 were superior than the other strategies. Among eight important strategies to manage visual pollution in Enghelab Square, the one, entailing the establishment of significant elements and use of public transportation with an attractiveness score of 7.292 and the one about the presence of significant elements and use of green spaces with an attractiveness score of 5.743, were considered the most useful, compared to other strategies. As a result, with regards to the issue of visual pollution, based on the present study, Vanak Square has a better condition than Enghelab square.

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