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ASSESSMENT OF VISUAL POLLUTION IN URBAN SQUARE IN BATNA CITY CENTER (ALGERIA): USING SWOT, AHP, AND QSPM TECHNIQUES

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ABSTRACT

Visual pollution is one of the forms of pollution that is no less dangerous than other common types of pollution (such as noise pollution, air pollution, and others). Visual pollution takes many forms, but it shares its essence with regard to its relationship to confusion in the brain's processing of inconsistent visual inputs, which negatively affects the individual's health in general, and in particular his mental and psychological health. The present study applies SWOT and QSPM techniques to identify and introduce the most influential factors related to visual pollution in the internal and external environment of Batna city, by assessment the rate of visual pollution in freedom squares. Accordingly, in the SWOT matrix, the strengths, weaknesses, threats and opportunities of these squares were studied, and using expert selection, the AHP method was applied to weigh them. SWOT can be used as an analytical tool for evaluation purposes in the QSPM system. Finally, using the quantitative strategic planning matrix (QSPM), the priorities of the selected strategies were determined, Using the QSPM matrix, the study proposed eight prioritization strategies, which provided the best possible strategy for this square.

KEYWORDS

Visual Pollution, Urban Square, AHP, QSPM, SWOT

CITATION

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1 Introduction

Pollution is a pervasive issue, continuously threatening human life and the natural environment. While pollution has existed as long as human history, its detrimental effects on the world are profound and ongoing. According to (Pepper et al., 2011.), pollution is defined as the accumulation of contaminants or other harmful substances that have negatively affected the environment and human health. Environmental pollution has long been recognized as one of the most significant threats to humanity, alongside other factors impacting human life quality. The general understanding of environmental pollution has traditionally been primarily associated with air, water, and noise pollution. Air pollution involves harmful particles and gases in the atmosphere, such as chemicals, particulates, and biological molecules (Lepori, 2016). It is the world's fourth-largest fatal health risk, causing 4.8 million premature deaths annually. The trends and threats associated with water pollution have worsened, significantly impacting regions such as Europe, China, India, South America, and Africa (Evans et al., 2019).

Furthermore, the continuous development of urbanization (Tao et al., 2021), economic growth (Yuan, et al., 2019), and transportation systems (Basner et al., 2014) have exacerbated noise pollution. This escalation is attributed to various anthropogenic sounds and activities, as well as poor urban design and chaotic construction practices, making noise pollution increasingly difficult to control, especially in urban areas.

Besides water, land, and air pollutions there are some other types of pollutions effects on our lives. One of these types is visual pollution which is new and affects our life significantly (Manisalidis et al., 2020). Nowadays the issue of pollutions has become an issue since many kinds of pollutions have been classified and they have negative impacts on our routine lives (Manisalidis et al., 2020). 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).

Visual formation is considered one of the significant factors, to get a full visual picture of cities in general. Normally establishing buildings and urban space items are referred to streets and squares as well as other public places, owned by municipality. 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. 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). Under the influence of human lifestyle and economic status, spatial directions and psychological aspects have suffered a lot (Purice, 2013).

In general, visual pollution is an aesthetic issue referring to the impacts of pollution that impair one's ability to enjoy a visit or view. It could be also defined as encountering unfavorable sight that flaunts the aesthetic appeal of a specific area. It occurs when an individual cannot enjoy the view in a particular area due to the drastic changes taking place in a named natural environment. It is defined as the whole of irregular formations, which are mostly found in natural and built environments (Yilmaz, May 2011).

Visual pollution is the set of damage inflicted on the landscape, two types of negative pollutions are found in the field of pollutions, these are, visual blight which refers to views such as high-tension lines, signboards, ugly buildings, etc. and visual clutter which can be experienced in daily life such as congested streets congested car parks …, (Asher et al., 2013). Effects of exposure to visual pollution include distraction, eye fatigue, decreases in opinion diversity, and loss of identity. It has also been shown to increase biological stress responses and impair balance as Yılmaz and Sagsöz (2011) affirmed. Based on Yılmaz and Sagsöz's (2011) studies.

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).

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 et al., 2011). Based on European Planning Chart in 2012, nowadays professional planning is scarcely coordinated with urban spaces (Voronych, 2013). 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 et al., 2011).

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 et al., 1994). Environments in which compact buildings without green spaces or buildings, not compatible with environment, 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, and it may be reflected throughout the city including local spaces and buildings.

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, Algerian Cities has undergone decreased environment quality in recent decades.

The present study has dealt with structural improvement of freedom square in terms of environmental qualities through visual comfort components, using the techniques of QSPM and SWOT for its assessment.

Urban space is a fundamental component of the city. Usually, being located between the buildings and parcels, the term urban space is referred to streets, squares and other public places owned by a municipality. Residing on the property border, urban spaces possess complex properties, which are regulated by the multiple urban factors. This enormous complexity of the urban space and wide range of its users makes it vulnerable to the impact of different kinds of pollution. In urban planning, pollution is related to redundant objects, side effects of human activities. Beside the traditional pollutants, visual contaminants look less harmful, but damaging many aspects of human lifestyles and economic health of the communities (Purice, 2013).

Human primary perception of places is normally visual. People perceive their living environment as a collage of images. The quality of visual environment is noticed on the sub-conscious level. Images we see become more or less obstructed by the visual garbage observed in the contemporary city. (Dunn Foundation, 2012). 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 et al., 1990, Ribeiro et al., 2006), and other objects.

The particular cases of visual pollution outline the contaminants, which can be classified into the following patterns:

- Media surfaces and various advertising (billboards, banners, signatures, commercial sculptures, flags etc.)
- Transportation vehicles (congestions, parking, even bicycles in some intensive places)
- Crowd (business, education, tourism)
- Soft temporary architecture (retail, entertainment, politic, religious, event oriented)
- Visual buffers (property fencing, transportation architecture, brownfields etc.)

Pollutions are result of unfair and excessive consumption, making it one of the important issues, regarding spatial planning (Voronych, 2013). European Planning Charter of 2012 says that planning professionals nowadays have to deal with identity loss and homogenization of urban space (E.C.S.P, 2012).

Nowadays, every city in Algeria experiences social transformations from planned to the market economy. Consequent commercialization led to the identity loss, and there is no difference between located in a downtown or at the suburban. These transitions have triggered spatial changes in urban fabric: streetscapes, squares, public places etc. During the times, when budgets are tight, hence municipalities are weak, streets are self-organized by locals. However, visual pollution by indicating places of intensive use becomes a primary interest for the planners.

2 Methods and data

2.1 Study area

Batna city, capital of the Aurès Massif (figure 1) at 1,048 meters (3,438 ft) above sea level, with an area of 2852.41 Ha is located in eastern Algeria, between 6°7’59" and 6°13'31" East longitude and between 35°34’23 and 35°31'26" North latitude. Located on high plains, at the crossroads of Constantine, Biskra and Khenchela. This gave him a polarizing role, easy accessibility which makes it a useful location to build and spread. It is the fifth largest city in Algeria, with more than 319742 residents and approximate 61100 housing units, Batna occupies a central and sensitive point. Statistical assessments show that Batna become in short time a pole of attractiveness and engine of economic growth, where the majority of economic activities.

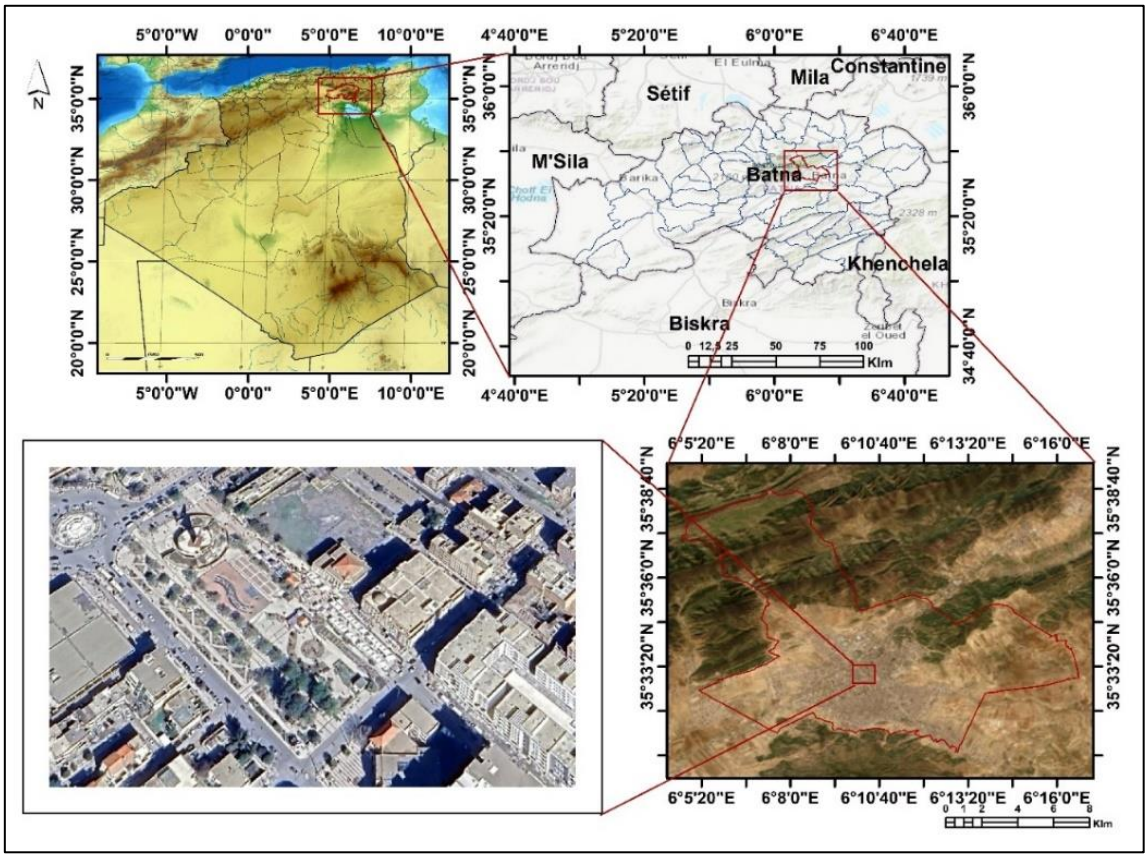

Fig. 1. *Location of the study area*

Freedom square is located at the city center of Batna (Fig 1), it is one of the main squares, its area is estimated 0.8120 ha, it is bordered on all sides by main streets, except for the northern side, which is bordered by a shopping center and some habitations. Due to its central position, where most of the facilities and equipment, especially commercial and libraries, are concentrated, in addition to its relative proximity to the university, lots of people pass this square daily.

Fig. 2. *Some manifestations of Visual pollution in freedom square*

2.2 Methodology and data processing

This study 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 sample volume in this study was about 50 questionnaires, distributed randomly in the urban square. 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. Finally, using AHP technique and its related software (Expert Choice), the strengths, weaknesses, opportunities and threats of urban squares were weighted and ultimately, based on SWOT and QSPM approaches, they were analyzed.

2.2.1. Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) has been invented by T. Saaty in 1970s (Ghodsipour, 2008), and developed by him (1980, 1988, 1995), It is one of the best known and most widely used MCA approaches, which has contradictory and various measures (Saaty, 1994). It allows users to assess the relative weight of multiple criteria or multiple options against given criteria in an intuitive manner. In case quantitative ratings are not available, policy makers or assessors can still recognize whether one criterion is more important than another. Therefore, pairwise comparisons are appealing to users. Saaty established a consistent way of converting such pairwise comparisons (X is more important than Y) into a set of numbers representing the relative priority of each of the criteria.

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 this research, firstly, we identified the criteria effective in visual pollution management. 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 research used experts' ideas in Planning and Environmental Management to analyze the criteria.

2.2.2. SWOT and QSPM methods

SWOT is the abbreviation of four analytical factors, namely strength used to analyze the strengths of an urban square, weakness is used to analyze the limitations experienced, opportunity to analyze environmental situations that benefit urban square and threat to analyze situations and can threaten. 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).

The objective in determining the strategy used from the SWOT results is basically to produce a viable alternative strategy, not to determine the best strategy, so that a manager can judge that not all strategies in SWOT are chosen to be developed. Quantitative Strategic Planning Matrix (QSPM) is a high-level strategic management approach for evaluating possible strategies. Quantitative Strategic Planning Matrix or a QSPM provides an analytical method for comparing feasible alternative actions. The QSPM method falls within so-called stage 3 of the strategy formulation analytical framework. According to (Zulkarnaen dan Sutopo, 2013) in (Suci, 2015) QSPM is a tool used to determine the best strategy that must be done to achieve optimal results. Based on research of (Zulkarnaen dan Sutopo, 2013) in (Hany S, Mas'ud E, Imam S, 2016), the advantage of using QSPM matrix is that there is no limit in evaluating the strategies used.

In present study, 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. Then by 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.

2.2.3. Formation of internal and external factors evaluation (IFE and EFE) matrix:

The most important factors were listed, Once the internal factors were investigated, 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):

- At first, the strengths and weaknesses are written.
- To each of these factors a coefficient is assigned (ranging from 0 as non- important to 1 as very important).
- To each of these factors the ratings range from 4 to 1, where 4 means a superior response, 3 above average response, 2 average response and 1 poor response, respectively.
- To determine the final score of each of the factor, its coefficient is multiplied by its score.
- Finally, the sum of final scores of all factor is calculated and the final score of the organization is determined.

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.

3 Results and discussion

3.1 Factor Evaluation (IFE-EFE) Matrix

From the internal factor analysis above, we will input the result of IFE analysis was obtained through a number of indicators of Strength and Weakness. Scores 1, 2, 3, and 4 represent basic weakness, little weakness, strength, and very powerful strength.

Table 1. Internal Factor Evaluation (IFE) Matrix

Internal factor evaluation			Weight	Score	Weighted score
Strengths	S1	Good accessibility	0,207	4	**0,828**
	S2	Low rise Buildings	0,061	4	**0,244**
	S3	Point-wise green spaces	0,131	2	**0,262**
	S4	Decreased advertising Tableaus	0,12	2	**0,24**
	S5	The existence of prominent elements	0,147	2	**0,294**
	S6	Presence of retailers	0,11	3	**0,33**
	S7	Presence of causes for collective memory (museum)	0,067	3	**0,201**
Weakness	W1	No spatial feeling	0,022	1	**0,022**
	W2	Lack of green spaces	0,017	2	**0,034**
	W3	Human and car traffic	0,026	2	**0,052**
	W4	Lack of appropriate urban furniture	0,022	1	**0,022**
	W5	View blockage	0,016	1	**0,016**
	W6	Existence of false Jobs	0,012	3	**0,036**
	W7	Lack of cleanliness	0,03	3	**0,09**
	W8	Lack of maintenance	0,012	4	**0,048**
Total internal factors			**1**		**2,719**

Source: Author's calculation

From the external factor analysis above, we will input the result of EFE analysis was obtained through a number of indicators of Opportunities and Threats. Scores 1, 2, 3, and 4 represent basic, little, strength, and very powerful strength.

Table 2. External Factor Evaluation (EFE) Matrix

External factor evaluation			Weight	Score	Weighted score
Opportunities	O1	Increased Visual Comfort	0,076	3	**0,228**
	O2	Increased spatial feelings	0,086	2	**0,172**
	O3	Higher landscape beauty	0,027	2	**0,054**
	O4	Decreased human and car encounters	0,077	3	**0,231**
	O5	Lower air temperature and pollution	0,21	4	**0,84**
	O6	Creating ability in the presence of people	0,214	2	**0,428**
	O7	Increased control of observer over the space	0,118	3	**0,354**
Threats	T1	Confusion	0,028	2	**0,056**
	T2	Disturbing traffic order	0,016	1	**0,016**
	T3	Less flexibility	0,037	2	**0,074**
	T4	Lack of observer control over the space	0,045	1	**0,045**
	T5	Lack of appropriate air conditioning and the stability of polluted air	0,028	2	**0,056**
	T6	Lack of landscape beauty	0,038	2	**0,076**
Total external factors			**1**		**2.630**

Source: Author's calculation

Table 1 gives internal factors of Batna's visual pollution management in freedom Square, presenting them in a matrix of internal factors' evaluation (Tables 1).

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 0.207 and the lowest one, 0.061. As for the weaknesses, the highest weight is 0.030 and the lowest one, 0.012.

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 2.47 and its maximum amount 4. Now, if this number is above 2.47, 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 2,719.

QSPM uses the weights, attributed to these factors, then using external factor evaluation, the most important opportunities and threats, related Square 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 2.231, 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 0,214 and the lowest ones, 0,016.

The sum of this amount is 2.630. 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.

3.2 Forming a SWOT Matrix (SWOT Analysis):

From analysis of internal and external factors, SWOT analysis can be made. SWOT analysis is used to find strategic choices that can be used and applied by combining strengths, weaknesses, opportunities, and threats that exist in the urban square, and is used as a basis for potential strategies (Tables 3). 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.

Table 3. SWOT analysis matrix

Strategies	Opportunities	Threats
	SO strategies	**TS strategies**
Strengths	1. Providing an opportunity for people to come together by focusing on prominent elements. (S5O6) 2. Rely on public transport and reduce the use of private cars. (S1O4) 3. Increase the spatial feelings by highlighting elements of collective memory. (S7O2) 4. Increase the liveliness of the place by focusing on surrounding retailers. (S6O7)	1. Enhancing of green spaces for air conditioning and reduce of air pollution (S3T5) 2. Organize traffic by designating dedicated circulation areas for pedestrians. (S1T2) 3. Increasing the readability of the space using distinctive landmarks. (S2T4) 4. Improving visual communication using smart signage. (S4T1)
	WO strategies	**WT Strategies**
Weaknesses	1. Providing urban furniture, and Maintenance of the components. (W4O6) 2. Preventing false jobs Preventing false jobs to reduce the visual pollution. (W6O1) 3. Enhancing of green spaces, for improving air quality and reducing air pollution. (W2O5) 4. Maintaining the cleanliness and organizing the waste collection process. (W8O7) 5. Organizing traffic and providing direct, unobstructed pathways. (W3O4) 6. Enhancing the aesthetic appeal. (W7O3) 7. Removing obstacles that obstruct the view. (W5O1)	1. Preventing of the presence of false jobs. (T1W6) 2. Maintaining the components of the area, including urban furniture and fountains. (T3W8) 3. Improving air quality and reducing air pollution through the enhancement of green spaces. (T5W2) 4. Maintaining the cleanliness of the area and organizing the waste collection process. (T6W7) 5. Organizing traffic and providing direct, unobstructed pathways. (T2W3)

Source: Author's calculation

3.3 Quantitative Strategic Planning Matrix (QSPM)

From each existing strategy from SWOT analysis, the three best strategies were chosen to be analyzed using the QSPM matrix which can then be developed and applied as a strategy. This system is an analytic technique, defining superior strategies.

Respectively, the column 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. Each column includes AS (Attractiveness Score) and TAS (Total Attractiveness Score). The latter is obtained by multiplying the weight in Attractiveness Score, 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.

Finally, TASs, related to each strategy, should be collected. Each strategy with the highest score has the highest priority for the organization, this matter is important in the process of strategy selection.

Table 5. QSPM matrix

Strategic factors	Weight	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																	
Good accessibility	0,207	4	0,828	3	0,621												
low rise Buildings	0,061	1	0,061	4	0,244					4	0,244						

Point-wise green spaces	0,131	2	0,262											2	0,262	
Decreased advertising Tableaus	0,12	2	0,24	3	0,36	4	0,48			2	0,24			2	0,24	
The existence of prominent elements	0,147	3	0,441	2	0,294	1	0,147	4	0,588			4	0,588	1	0,147	3	0,441
Presence of retailers	0,11	3	0,33	2	0,22	1	0,11	4	0,44	2	0,22	4	0,44	1	0,11	3	0,33
Presence of causes for collective memory (museum)	0,067	2	0,134					2	0,134	2	0,134			2	0,134	1	0,067
Weaknesses																	
No spatial feeling	0,022	1	0,022					1	0,022	3	0,066			4	0,088		0
Lack of green spaces	0,017	3	0,051	2	0,034	3	0,051	1	0,017	2	0,034	2	0,034	2	0,034	2	0,034
High traffic density	0,026	2	0,052			3	0,078	1	0,026		0		0	1	0,026	4	0,104
Lack of appropriate urban furniture	0,022	2	0,044	2	0,044	4	0,088	1	0,022	3	0,066	2	0,044	1	0,022	2	0,044
View blockage	0,016	1	0,016			3	0,048										
Existence of false Jobs	0,012	3	0,036			3	0,036			2	0,024	2	0,024	4	0,048	2	0,024
Lack of cleanliness	0,02	1	0,02	3	0,06	4	0,08	1	0,02	2	0,04		0	1	0,02		0
Lack of maintenance	0,012	2	0,024	3	0,036			1	0,012			2	0,024	2	0,024	3	0,036
Opportunities																	
Increased Visual Comfort	0,076	4	0,304	3	0,228	3	0,228	4	0,304	3	0,228	3	0,228	3	0,228	3	0,228
Increased spatial feelings	0,086	3	0,258	4	0,344	1	0,086	2	0,172	2	0,172	1	0,086				

Higher landscape beauty	0,027			2	0,054	2	0,054	1	0,027	1	0,027	1	0,027	3	0,081	3	0,081
Decreased human and car encounters	0,077	3	0,231	2	0,154	4	0,308	3	0,231	2	0,154	3	0,231	1	0,077	1	0,077
Lower air temperature and pollution	0,21	2	0,42	2	0,42	1	0,21	4	0,84			2	0,42			3	0,63
Creating ability in the presence of people	0,214	1	0,214	2	0,428	2	0,428	3	0,642	3	0,642	3	0,642			2	0,428
Increased control of observer over the space	0,118	3	0,354	3	0,354	2	0,236	2	0,236	3	0,354	1	0,118	3	0,354		
Threats																	
Confusion	0,028			2	0,056	2	0,056	2	0,056	2	0,056	2	0,056	4	0,112		
Disturbing traffic order	0,016	2	0,032			1	0,016	2	0,032	1	0,016	3	0,048	3	0,048	1	0,016
Less flexibility	0,037	2	0,074	1	0,037	1	0,037	1	0,037	1	0,037	2	0,074	3	0,111	1	0,037
Lack of observer control over the space	0,045	1	0,045	2	0,09					2	0,09	3	0,135	4	0,18	2	0,09
Lack of appropriate air conditioning and the stability of polluted air	0,028	2	0,056	1	0,028					1	0,028	2	0,056	3	0,084	1	0,028
Lack of landscape beauty	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			4,625		4,144		2,815		3,896		2,91		3,351		2,544		2,733

Source: Author's calculation

From the QSPM analysis table, it can be concluded that the SO1 strategy has the highest value of 4.625, The next strategy that must be carried out based on the table is SO2 strategy, which in QSPM analysis has a value of 4.144. These strategies consider heritage, culture, art installations and performances as a mean to

create a sense of a place and a bespoke local character, Overall, placemaking means creating places and focuses on transforming public spaces to strengthen the connections between people and the built environment, focusing on peoples' needs and inspire people to collectively reimagine and reinvent public spaces, strengthening the connections between the users and their surroundings.

Through our analysis of the results, we recorded a great consensus regarding the suffering of the various components of the axis and their lack of achievement for visual comfort, where it was unanimous that both facades and umbrellas above the shops are in poor condition and not consistent. Based on all of the above, we can say that the problem with the emergence of visual pollution in urban square in Batna city is due to the misuse of public space, which stems from the misbehaviour of the accumulation of negatives that result in visual pollution. In addition to the limitations of the planning system and its disregard for aesthetic dimensions leads to the emptying of the architectural image of the components of the city from its aesthetic content, the city of Batna needs a more effective planning policy in order to eliminate such phenomena, which have affected the comfort and happiness of man.

4 Conclusions

The aim of this study was to investigate SWOT analysis in the process of managing visual pollutions, related to freedom Square in Batna city center, Algeria. 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 freedom square, the obtained score for internal factors was 2,719 and the score obtained for external factors, 2.630. Therefore, based on principles of strategic management, the strategic position of freedom square was in invasive area. Based on examination of the scores of internal factors, it was found that the research score was above 2.47. 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 2.231. 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 freedom square, the obtained score of internal factors was below 2.47, therefore, weaknesses dominated the strengths and since the obtained scores of external factors were above 2.231, opportunities dominated threats, making this square's position conservative.

Among the eight important strategies of visual pollution management in freedom Square, the strategy of establishing air conditioning systems, while maintaining low-rise buildings, with an attractiveness score of 4.625 and the strategy of increasing visual comfort with emphasis on presence of routes to open spaces with an attractiveness score of 4.14 were superior than the other strategies.

All authorities should encourage healthy and sustainable lifestyle through healthy and resilient urban Squares, as an extend a set of urban squares principles should therefore be established in order to improve population health and ecosystem prosperity, The main principles that introduces are: Transport and Movement, Green Infrastructure, placemaking, and Social Infrastructure. Promoting and adopting the urban square principles we trigger the sense of ownership, as well as safety, allowing users to create new memories and a sense of belonging with space they interact.

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