Strategic planning for organizing conflicting industries and manufacturers
Case study: District 21 of Tehran

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Abstract:
Nowadays, due to the rapid and unforeseen growth of industries inmetropolitan areas, industrial sites, and urban regions have become closely connected. This matter has brought up several complications such as physical challenges, environmental pollution, and social anomalies, to name a few. One solution can be to take into account the mutual effects of industrial sites and urban areas form a strategic point of view. This paper studies District 21 of Tehran as one of the most industrial areas of the city, which is facing many problems in the field of urban management due to a large number of closely located industrial sites and a lack of homogeneity of industrial uses. The main objective of this study is to provide key strategies for the organization of industries and manufacturers in order to achieve a solution for the coexistence of industrial sites in urban areas by the means of strategic planning. This is done by analyzing the current situation in District 21 of Tehran based on conflicting industrial sites and manufacturers. In this research descriptive analytics has been used with the main object of practicality. The technique used for data analysis is the hybrid AHP-SWOT model. Furthermore, the results of this study indicate that the existing structure of the mentioned district in terms of its industries and manufacturers is focused on internal strengths and external threats. Therefore, in planning the organization of conflicting industries and manufacturers of District 21, the emphasis must be on diversification(contingency) strategies that are based on using existing strengths to deal with threats with the goal of maximizing said strengths and minimizing threats.

Key Words: Organizing, Industries and Manufacturers, Conflict, Strategic Planning

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1. Introduction :

1.1. Problem specification:

Not Long after the industrial revolution, a major growth occurred in urbanization, which caused the residents of urban areas in developing countries to be inhabited near their workplace (Gholami, 2016). One of the side effects of this rapid and unforeseen growth is the interference of polluting industries with urban areas. Such industries, which were at first located with an appropriate distance from the urban fabric, have moved closer and even entered metropolitans, as a consequence of the growth of urban areas. This has caused the different layers of industrial uses to become mixed with the urban fabric and create various problems (Mohammadzadeh, 2016). In other words, the establishment of polluting businesses, due to the needs of citizens in urban areas, has brought up countless complications. Naturally, in order to eliminate, or at least reduce, these complications, it is necessary to take special measures and conduct appropriate studies (Shakur and Khosravi, 2016). Organizing businesses in urban areas and determining appropriate locations for workplaces in cities is a necessity of urban communities and an important task of municipalities. In fact, if polluting industries and manufactures are located improperly and without organization near residential areas, they will pose many dangerous threats and discomforts, including air pollution, noise pollution, waste accumulation, roadblocks and traffic junctions, particle distribution, unpleasant odor, ground vibration, sewage, smoke and greenhouse gasses, physical and mental health problems for the citizens and aesthetic problems in the city (Abdolmaleki et al., 2015). In this regard, this study focuses on District 21 of Tehran as one of the most in-dustrial areas of this city which faces many problems in the field of urban management due to the location of numerous industries and heterogeneity in industrial uses. Therefore, providing an optimal model in accordance with the urban conditions and requirements, considering the development patterns based on sustainability, is an und eniable necessity. In this research, in addition to evaluating and analyzing the current situation of the municipality of District 21 of Tehran on the basis of conflicting industrial sites, efforts have been made to formulate, determine, and prioritize strategies for organizing these industries and manufacturers in the region, to improve the current situation and to ultimately improve the quality of life of the citizens of the region.

1.2. Objectives:

One problem that can be seen in both small and large cites in Iran is the inappropriate establishment of industrial sites and manufacturing plants, which causes inconsistency in the physical structure of the city. As a result, the activity of these units cause conflict and pollution for the citizens and leads to a drop in the quality of the city's environment. Therefore, one of the goals of urban planning and management is to organize and establish industrial sites and manufacturing plants (Golmohammadi, 2014: 107).

With this point in mind, the objectives of this research are as follows.

A) Analyzing the current situation of the district's structure on the basis of conflicting industries and manufacturers in the form of recognizing strengths, bottlenecks, and complications

B) Developing, determining, and priort itizing strategies for organizing the district's conflicting industries and manufacturers

1.3. Method:

The main object of this research is to achieve a practical method in organizing conflicting industries and manufacturers. To do so, a descriptive-analytic approach is taken. The method of this research is described as follows. First, by reviewing the resources, a theoretical framework has been developed. Then, District 21 of Tehran is analyzed using modern methods, ie strategic planning, through spatial analysis, using the hybrid AHP-SWOT model. This analysis is conducted in terms of conflicting industrial sites and manufacturing plants with consideration to their strengths, weaknesses, opportunities, and threats. Finally, the mentioned strategies are developed, determined, and prioritized.

The statistical population of this study consists of academic experts and experts and managers of executive institutions related to the subject. With the use of targeted sampling as the sampling method of this study, after the identification of experts and relevant institutions and organizations, such as District 21 Municipality, Industry and Business Organization Company, and several production unions, thirty experts were identified. Hence, according to the limited number of managers, experts, and specialists in the field of conflicting industries and manufacturers, a questionnaire was prepared and conducted.

2. Theoretical literature:

In this section, the concepts, definitions, views, and theoretical foundations related to the main research topic are discussed.

2-1- Definitions and concepts:

A) Urban industries: Industries that do not naturally have the ability and right to de-

velop and grow more than the capacity of the city in which they are located in terms of raw material, space, energy, and manpower, otherwise they will cause pollution and damage to the physical environment of the city and its urban community (Marcus, 2009: 22).

B) Establishment system: A suitable spatial distribution of industries, in accordance with the needs of the citizens with the least environmental side-effects. This includes orientating the distribution of business activities related to industries based on future changes, reducing the demand for relocation by the appropriate distribution of businesses with trans-regional activities in the city, guiding the high-priority industries to achieve balanced development, concentrating industrial uses in one locality, and creating service complexes (Samandehi Company, 2008).

C) Conflict caused by industrial activities: Any side-effect or consequence of industrial activities that disrupts urbanization and causes problems for the citizens (Farnehad Consulting Engineers, 2012)

D) Compatibility: Establishing compatible industrial uses in one locality and vice versa separating conflicting industrial uses from each other. The purpose of compatibility is to find proper places for the establishment of industries and transfer conflicting industrial uses away from the compatible ones (Ziari, 2003: 29).

2-2- Theories related to the relocation of industrial sites:

At the beginning of the Industrial Revolution, the location of industrial plants was chosen mainly based on natural factors, economic considerations, and transportation facilities. However, from the mid-nineteenth century, with the emergence of the negative effects of industrial development

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in European cities, measures began to be taken to monitor the development of industries and to protect the environment and urban health. Consequently, from the early twentieth century, the location of urban industrial sites found great importance in urban design and management(Papoli Yazdi, 2007). The most important theories related to the establishment of industries are as follows.

A) The "linear city" theory by Arturo Soria y Mata:

The linear city theory by Arturo Soria y Mata has become a symbol of the industrial city phenomenon in the emerging era of modernism. Since the modern life and the novel relations in production, created new proportions in the structure of the modern city and the industrial age caused the cities to grow without limit, Soria y Mata planned the structure of the industrial city on the basis of transportation and transit axes such as railways, roads or rivers. In this regard, the industrial uses are also established in specific areas along the mentioned central axis in Soria y Mata's plan in order to form a linear industrial zone (Shokouei, 2009).

B) The Cité Industrielle (Industrial City) theory by Tony Garnier:

The industrial city plan is the first holistic theory in the field of establishing industrial sites and urban design, which offers industrial zoning with a focus on environmental concepts. In this plan, the location of industrial sites is determined based on the industry's activities and its external effects. In finding an appropriate location for an industrial site, Garnier's Industrial City plan considers two main points: first, the separation of industrial areas from urban areas, and second, the proposal to use a green belt to create a barrier between conflicting and heterogeneous ar-

eas, which has nowadays found great importance in urban design and management (Strofsky, 1999: 43).

C) The Industrial Garden City theory of Paul Wolf

In this theory, three to four gardens are created with populations of 100,000 people. The most important distinction between this theory and the Garden City plan of Ebenezer Howard is in selecting the location of a large industrial area. In Howard's theory, all technical facilities of an industrial area are located within the chosen area and are completely separate from residential parts; however, Wolf's theory offers the possibility of using industrial facilities in the modern city(Papli Yazdi and Rajabi, 2007).

D) Alfred Weber's Theory Industrial Location:

Weber›s theory in terms of the establishment system is based on the concept of «industrial accumulation». Weber considers transportation, labor force, and accumulation of industrial units as the most important factors in the formation of industrial zones in metropolitan areas. Following his views on the subject, other experts, such as Smithand Palander have also considered "industrial accumulation" to be the best way of industry establishment (Berry, 1970).

E) Von Thünen's, location theory based on "concentric circles":

In this theory, as we move farther from the market (here the city) toward the suburbs, the value of the volume of production decreases. Von Thünen‹s theory has not been fully practical due to its reliance on abstract hypotheses; however, his works have formed the basis for later theories. In this regard, we can point out the classic "central place" theory which can be rooted back to

Von Thünen's works (Saberifar, 2002).

2-3- Well-known approaches in organizing industries

In general, there are three main approaches in establishing industries in the city, which are summarized as follows.

A) Industrial Attraction Approach (Economic Perspective): This approach is based on the establishment of industries in cities and population centers in order to take advantage of the cheap urban infrastructure according to the law of maximum profit and minimum cost.

B) Industrial rejection approach (environmental perspective): This approach is based on repelling and denying any industrial activity in residential areas and population centers based on extreme environmental considerations and anti-industrial views.

C) Industrial Selection Approach (Sustainable Development Perspective): In this approach, industrialization and urbanization are combined based on optimal planning and organization, in order to create homogeneity between industrial and residential areas for sustainable and comprehensive development in the current situation of the modern world. Along with the development of new theories and new organization and development methods, the approaches of economic development, in which industries grow uncontrollably, and the one-sided rejection of industrial sites from population centers have been replaced by a new perspective that has attracted the efforts of national and international development associations. Based on this perspective, it is possible to systematize the physical and social relations of the city and meet the comprehensive needs of the society, with-

out having to let industrial development to grow uncontrollable or completely reject industrialization. There is no other way to achieve sustainable development, social welfare, and quality improvement except the reconciliation of industry and the city and the search for better ways to achieve it (Tehran Center for Studies and Planning; 2008: 21).

3. The study area:

In terms of geographical location, the study area starts from the north of District 22 and continues south until the southern green belt of Tehran and Shahriar city. From the east, it is adjacent to Districts 5, 9 and 18, and continues west until the city of Karaj. District 21, which is 5156 hectares and 8.7% of the total area of Tehran, is considered one of the largest districts of this city.

Figure 1: the geographical location of the study area
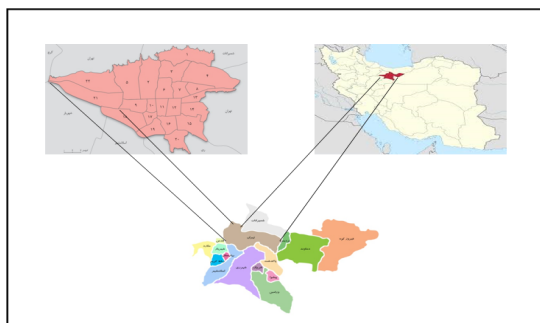
This district is an extremely industrial area and is one of the most industrialized parts of Tehran due to having numerous industries (865 pieces) as well as a vast industrial area (869 hectares). In terms of the number of industries, Tehran is mainly comprised of metal production industries (Code 28), and in terms of industrial area, the largest industrial zone belongs to a motorcycle manu-

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facturing industry (code 34); however, the machinery manufacturing industry covers most of Tehran's total industrial area (code 29). Furthermore, half of all the industrial machinery production industries (code 30) and 97% of the total area of the motorcycle manufacturing industry(code 34) of Iran are located in District 21 of Tehran(Kohan Dezh Consulting Engineers, 2016).

4- Results and Discussion:

4-1- The process of strategic planning for organizing conflicting industries and manufacturers of District 21 of Tehran:

The strategic planning process for organizing conflicting industries and manufacturers in District 21 of Tehran is done with the help of the hybrid AHP-SWOT model in five steps, which are given as follows.
A) Evaluation of external and internal factors by forming evaluation matrices
B) Analysis of strategic factors
C) Implementing and developing strategies
D)Forming an internal-external matrix and determining the type of each strategy
E) Prioritizing the acceptable strategies using the AHP model

4-2- Strategies for organizing conflicting industries and manufacturers in District 21 of Tehran

In order to develop the strategies for organizing conflicting industries and manufacturers in Tehran and presenting development strategies in this field, their external and internal capabilities and limitations in the region were identified. To distinguish the most important of these external and internal factors to enter the internal and external evaluation matrix, a survey was taken from experts (including managers of executive organs and renowned professors in this field). After that, by using the hybrid AHP-SWOT model, a paired comparison of each of the internal and external factors was performed, and after determining the weight and rank of each factor, its final score was obtained. Next, by analyzing these scores, the four types of strategies were identified with the help of the SWOT matrix, and then based on the internal and external matrix, the type of each strategy was determined. Finally, the developed strategies were prioritized based on the AHP model.

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Table 1: Capabilities and limitations of District 21 of Tehran in terms of conflicting industries and manufacturers

Strengths	Weaknesses	Opportunities	Threats
A decreasing trend in heterogeneous and conflicting industries	Facing many security challenges in the process of organizing large industries	Decentralized distribution of industries that need to be relocated across the city	Lack of adequate capacity to implement adjustment policies (conflict resolution and homogenization) in some industrial categories due to lack of facilities, technology, and requirements
The establishment of most large-scale industries in authorized industrial zones	Lack of superstructure in the development and expansion of knowledge-based electrical and electronic industries	Possibility of adjustment rather than the relocation of some industries	Possible rejection of the predicted measures that need to be taken by macro-indigenous industries due to maintaining their full economic and political power

Previous experience in organizing and relocating industries in Tehran Municipality	Failure in most of the previous practical experiences due to negative, coercive and partial approaches	Existence of potential basis for resolving conflict and homogenization of some conflicting and heterogeneous industries such as academic, technical, and human capacities.	The general desire to establish profitable monopoly-based industries and mass production instead of relying on knowledge-based production and commercialization
Willingness of the majority of industrial units to participate in the process of organizing and their possible relocation, with economic justification	Lack of anticipation of executive leverages and the infringement of paragraph 20 of Article 55 Of Municipality Law	The attraction of industrial activities and production workshops to Indigenous industries of Tehran	Lack of legal authorities to support urban management in facing state and government ownership
The gradual emergence of fast-yielding enterprises with a moderate level of activity compatible with urban performance	The partly contradiction of the industrial corridor of chemical, plastic, and rubber industries in the west of Tehran with the detailed plan	High economic productivity in an acceptable number of industries that can be adjusted (conflict resolution and homogenization) rather than relocated, as well as, high economic justification for industrial zones that need to be relocated	Possibility of the establishment, development and, expansion of industries that are polluting, heterogeneous and contradictory with the stabilization and absorption groups identified in the industrial areas of the detailed plan
The compliance of the majority of the area under the establishment of Tehran Industrial System with the zoning of the detailed plan	Concentration of suitable areas for industries to be relocated to in the southern and central parts of Tehran	The Liberation of lands under the establishment of heterogeneous and conflicting industries in their process of organization and relocation	Ignoring the proposed appropriate industrial types in the industrial zoning of the detailed plan in attracting newly constructed industries in urban areas

4-2-1- Internal Factor Evaluation(IFE) matrix:

This matrix evaluates the internal strengths and weaknesses of the system. It also provides solutions for identifying and evaluating relationships between different issues. Based on the IFE results of this study, the two most important strengths of the organization of industries and manufacturers in Tehran are the "the establishment of most large-scale industries in authorized industrial zones" and "the compliance of the majority of the area under the establishment of Tehran Industrial System with the zoning of the detailed plan especially in District 21" with average coefficients of 0.12 and 0.08, both scores of 4, and the final weights of 0.48 and 0.32, respectively. The second two most important strengths are "the downward trend in conflicting and heterogeneous industrial zones" and "the gradual emergence of fast-yielding enterprises with a moderate level of activity compatible with urban performance" with average coefficients of 0.07 and 0.04, scores of 3 and 4, and final weights of 0.21 and 0.16, respectively. The remaining factors are evaluated as follows: "previous experience in organizing and relocating industries in Tehran Municipality" has an average coefficient of 0.05, a score of 3, and a final weight of 0.15; "the willingness of the majority of industrial units to participate in the process of organizing and their possible relocation with economic justification" has an average coefficient of 0.03, a score of 3, and a final weight of 0.09.

On the other hand, the two most critical weaknesses are "the lack of superstructure in the development and expansion of

knowledge-based electrical and electronic industries as the main industries in Tehran" and "the partly contradiction of the industrial corridor of chemical, plastic, and rubber industries with the detailed plan" with average coefficients of 0.18 and 0.11, scores of 1 and 2, and final weights of 0.18 and 0.22, respectively. The third most important weakness is "the concentration of suitable areas for industries to be relocated to in the southern and central parts of Tehran" with an average coefficient of 0.09, a score of 2, and a final weight of 0.18. And in the fourth place the two weaknesses of "the lack of anticipation of executive leverages and the infringement of paragraph 20 of Article 55of Municipality Law" and "facing many security challenges in the process of organizing large industries" tie with average coefficients of 0.08, scores of 2, and final weights of 0.16.

The results of this evaluation show that the total final score of internal factors for organizing Tehran's industries and manufacturers is equal to 2.54. Since this score is higher than the average, which is equal to 2.5, it shows that the strengths in this area outweigh the weaknesses. In other words, the city of Tehran is strong in terms of organizing industries and manufacturers that are conflicting with urban areas in terms of internal factors.

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Table 2: IFE matrix for organizing conflicting Industries and Manufacturers

Internal strategic factors		Weight derived from AHP	Rank	Final score
Strengths	A decreasing trend in heterogeneous and conflicting industries	0.07	4	0.28
	Previous experience in organizing and relocating industries in Tehran Municipality	0.05	3	0.15
	The establishment of most large-scale industries in authorized industrial zones	0.12	4	0.48
	Willingness of the majority of industrial units to participate in the process of organizing and their possible relocation, with economic justification	0.03	3	0.09
	The gradual emergence of fast-yielding enterprises with a moderate level of activity compatible with urban performance	0.04	4	0.16
	The compliance of the majority of the area under the establishment of Tehran Industrial System with the zoning of the detailed plan	0.08	4	0.32

Internal strategic factors		Weight derived from AHP	Rank	Final score
Weaknesses	Facing many security challenges in the process of organizing large industries	0.08	2	0.16
	Lack of superstructure in the development and expansion of knowledge-based electrical and electronic industries	0.18	1	0.18
	Failure in most of the previous practical experiences due to negative, coercive and partial approaches	0.08	2	0.16
	Lack of anticipation of executive leverages and the infringement of paragraph 20 of Article 55	0.08	2	0.16
	The partly contradiction of the industrial corridor of chemical, plastic, and rubber industries in the west of Tehran with the detailed plan	0.11	2	0.22
	Concentration of suitable areas for industries to be relocated to in the southern and central parts of Tehran	0.09	2	0.18
Total				**2.54**

4-2-2- External Factors Evaluation (EFE)

In this section, the city of Tehran is assessed based on its external environmental factors in order to identify the opportunities and threats that this city is facing in the organization of conflicting industries and manufacturers. The most effective of these opportunities and threats were identified, based on previously conducted studies and a survey taken from experts, and were evaluated as shown in Table 3. Based on the conducted evaluations, the three most important opportunities facing the 21st district of Tehran are "the liberation of lands under the establishment of heterogeneous and conflicting industries in their process of organization and relocation", "the existence of a potential basis for resolving conflict and homogenization of some conflicting and heterogeneous industries such as academic, technical, and human capacities", and "high economic productivity in an acceptable number of industries that can be adjusted (conflict resolution and homogenization) rather than relocated, as well as, high economic justification for industrial zones that need to be relocated" with average coefficients of 0.14, 0.08 and 0.10, ranks of 4, 4.4, and 4, and the final scores of 0.56, 0.32, 0.4, respectively. The rest of the opportunities that have lower importance in comparison are "the attraction of industrial activities and production workshops to indigenous industries of Tehran", "the possibility of adjustment rather than the relocation of some industries", and "the decentralized distribution of industries that

need to be relocated across the city" with average coefficients of 0.06, 0.05, and 0.03, all ranks of 3, and final scores of 0.18, 0.15, and 0.09, respectively.

On the other hand, the three most important threats facing district 21 of Tehran in this matter are "the lack of legal authorities to support urban management in facing state and government ownership", "the possibility of the establishment, development, and expansion of industries that are polluting, heterogeneous and conflicting with the stabilization and absorption groups identified in the industrial areas of the detailed plan", and "the general desire to establish profitable monopoly-based industries and mass production instead of relying on knowledge-based production and commercialization" with average coefficients of 0.17, 0.10, and 0.09, all ranks of 1, and final scores of 0.17, 0.10, and 0.09, respectively. After that, the remaining threats that are of lower importance in comparison are " ignoring the proposed industrial types that are appropriate for the industrial zoning of the de-

tailed plan in attracting newly constructed industries in urban areas", "the possible rejection of the predicted measures that need to be taken by macro-indigenous industries due to maintaining their full economic and political power", and "the lack of adequate capacity to implement adjustment policies (conflict resolution and homogenization) in some industrial categories due to lack of facilities, technology, and requirements" with average coefficients of 0.07, 0.06, and 0.05, all ranks of 2, and final weights of 0.14, 0.12, and 0.10, respectively.

According to Table 3, the total final score of external factors for organizing conflicting industries and manufacturers is equal to 2.42. The fact that this score is lower than the average, which is equal to 2.5, means that the threats that this region is facing in the field of organizing industries and manufacturers outweighs its opportunities. In other words, the region has not been able to take advantage of the factors that create opportunities and avoid the factors that cause threats.

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Table 3: EFE matrix for organizing conflicting industries and manufacturers

External Strategic factors		Weight derived from AHP	Rank	Final score
Opportunities	Decentralized distribution of industries that need to be relocated across the city	0.03	3	0.09
	Possibility of adjustment rather than the relocation of some industries	0.05	3	0.15
	Existence of potential basis for resolving conflict and homogenization of some conflicting and heterogeneous industries such as academic, technical, and human capacities.	0.08	4	0.32
	The attraction of industrial activities and production workshops to Indigenous industries of Tehran	0.06	3	0.18
	High economic productivity in an acceptable number of industries that can be adjusted (conflict resolution and homogenization) rather than relocated, as well as, high economic justification for industrial zones that need to be relocated	0.10	4	0.4
	The Liberation of lands under the establishment of heterogeneous and conflicting industries in their process of organization and relocation	0.14	4	0.56

External Strategic factors		Weight derived from AHP	Rank	Final score
Threats	Lack of adequate capacity to implement adjustment policies (conflict resolution and homogenization) in some industrial categories due to lack of facilities, technology, and requirements	0.05	2	0.1
	Possible rejection of the predicted measures that need to be taken by macro-indigenous industries due to maintaining their full economic and political power	0.06	2	0.12
	The general desire to establish profitable monopoly-based industries and mass production instead of relying on knowledge-based production and commercialization	0.09	1	0.09
	Lack of legal authorities to support urban management in facing state and government ownership	0.17	1	0.17
	Possibility of the establishment, development and, expansion of industries that are polluting, heterogeneous and contradictory with the stabilization and absorption groups identified in the industrial areas of the detailed plan	0.10	1	0.10
	Ignoring the proposed appropriate industrial types in the industrial zoning of the detailed plan in attracting newly constructed industries in urban areas	0.07	2	0.14
Total				**2.42**

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4-2-3- Developing strategies for organizing conflicting industries and manufacturers using the SWOT matrix:

The strategies for organizing conflicting industries and manufacturers were performed in three steps with the SWOT matrix. The first step is to identify opportunities and threats, the second is to identify strengths and weaknesses, and the last step is to develop strength-opportunity, weakness-opportunity, strength-threat, and weakness-threat strategies (Table 4). After identifying the internal factors (strengths and weaknesses) and external factors (opportunities and threats) in the study area, the internal and external factors evaluations (IFE, EFE) were preformed by the SWOT matrix. After that, strategies tailored to internal and external factors were developed based on Table 4 to organize industries and manufacturers that are conflicting with urbanization.

Table 4: Swot matrix and the development of strategies for organizing conflicting industries and manufacturers

Internal factors	Strengths	Weaknesses
	A decreasing trend in heterogeneous and conflicting industries	Facing many security challenges in the process of organizing large industries
	The establishment of most large-scale industries in authorized industrial zones	Lack of superstructure in the development and expansion of knowledge-based electrical and electronic industries
	Previous experience in organizing and relocating industries in Tehran Municipality	Failure in most of the previous practical experiences due to negative, coercive and partial approaches
	Willingness of the majority of industrial units to participate in the process of organizing and their possible relocation, with economic justification	Lack of anticipation of executive leverages and the infringement of paragraph 20 of Article 55
	The gradual emergence of fast-yielding enterprises with a moderate level of activity compatible with urban performance	The partly contradiction of the industrial corridor of chemical, plastic, and rubber industries in the west of Tehran with the detailed plan
External factors	The compliance of the majority of the area under the establishment of Tehran Industrial System with the zoning of the detailed plan	Concentration of suitable areas for industries to be relocated to in the southern and central parts of Tehran
(Opportunities (O	SO strategies	WO strategies
Decentralized distribution of industries that need to be relocated across the city	SO1: Establishment and implementation of Tehran's indigenous and highly attractive industries in industrial zones	WO1: Creating balance and proportionality between negative-eliminative and adaptive-stability approaches due to the presence of a diverse range of conflicting and heterogeneous urban industries
Possibility of adjustment rather than the relocation of some industries	SO2: Providing the basis for the liberation of industrial zones for relocation and increasing their economic value as incentives	WO2: Improving the knowledge base of the city's indigenous industries to reduce the negative consequences of their establishment
Existence of potential basis for resolving conflict and homogenization of some conflicting and heterogeneous industries such as academic, technical, and human capacities.	SO3: Industrial clustering and constructing industrial corridors in stable and highly attractive industries	WO3: The formation of specialized industrial clusters in places that are considered for the relocation of industries
The attraction of industrial activities and production workshops to Indigenous industries of Tehran		

High economic productivity in an acceptable number of industries that can be adjusted (conflict resolution and homogenization) rather than relocated, as well as, high economic justification for industrial zones that need to be relocated		
The Liberation of lands under the establishment of heterogeneous and conflicting industries in their process of organization and relocation		
Threats	ST strategies	WT strategies
Lack of adequate capacity to implement adjustment policies (conflict resolution and homogenization) in some industrial categories due to lack of facilities, technology, and requirements	ST1: Achieving specialized industrial clustering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed	WT1: Considering the effectiveness of the level of conflict and heterogeneity of intermediate industries and workshops in determining their method of organization
Possible rejection of the predicted measures that need to be taken by macro-indigenous industries due to maintaining their full economic and political power	ST2: Providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries	WT2: Considering spatial constraints for Industries established in the city that are not inclined towards having a knowledge base and an active research and development center
The general desire to establish profitable monopoly-based industries and mass production instead of relying on knowledge-based production and commercialization	ST3: Encouraging and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives and facilities	WT3: Preventing the establishment of dependent non-urban industries in the vicinity of large-scale non-urban industries that do not need relocation
Lack of legal authorities to support urban management in facing state and government ownership	ST4: Development of special and case-by-case action plans for large-scale state-owned industries	
Possibility of the establishment, development and, expansion of industries that are polluting, heterogeneous and contradictory with the stabilization and absorption groups identified in the industrial areas of the detailed plan	ST5: Considering the proportionality of land prices of the new locations for industrial establishment with economic indicators of industries and manufacturers that need to be relocated	
Ignoring the proposed appropriate industrial types in the industrial zoning of the detailed plan in attracting newly constructed industries in urban areas		

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4-2-4- Forming the internal and external matrix and determining strategies for organizing conflicting industries and manufacturers

In this section, in order to determine the type of each strategy, the Internal and External (IE) matrix is used. As shown in Figure 2, since the average scores obtained from the IFE and EFE matrices are equal to 2.54 and 2.42, respectively, the intersection of internal and external scores is located in the fourth section, which is the diversity model (ST) section. Therefore, in planning the organization of conflicting industries and manufacturers of District 21, it is necessary to emphasize diversification (contingency) strategies in order to use the internal strengths of the industries to prevent the negative effects of external threats of the area. In other words, it is essential to plan on the identified threats and minimize them by taking advantage of the strengths and opportunities.
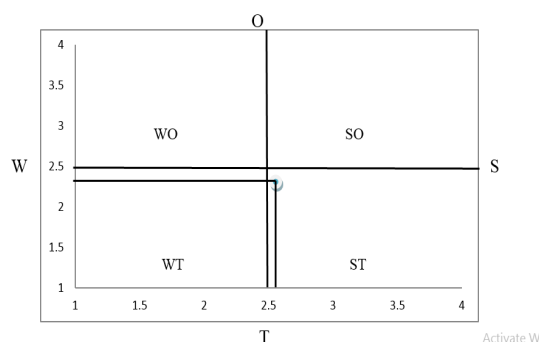
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Figure 2: Diagram of determining the situation of District 21 of Tehran in terms of its main strategy for organizing conflicting industries and manufacturers by the IEA method

Accordingly, among the most important diversification strategies (ST) that focus on internal strengths and external threats are: Achieving specialized industrial clus-

tering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed

- Providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries
- Encouraging and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives and facilities
- Development of special and case-by-case action plans for large-scale state-owned industries
- Considering the proportionality of land prices of the new locations for industrial establishment with economic indicators of industries and manufacturers that need to be relocated

4-2-5: Prioritizing strategies for organizing conflicting industries and manufacturers of District 21 of Tehran using the AHP Model:

The following steps were taken in order to prioritize acceptable strategies in organizing conflicting urban industries and manufacturers.

Step 1: evaluating the strategies developed in the field of conflicting urban industries and manufacturers by experts in relation to each of the internal and external factors based on a paired comparison questionnaire

Step 2: Multiplying the weight obtained for each strategy (option) in the weights of its corresponding internal and external factors (criteria) in order to calculate its final score and thus determine the ranking of all strategies

Step 3: Selecting the best strategies and prioritizing them according to their final ranking
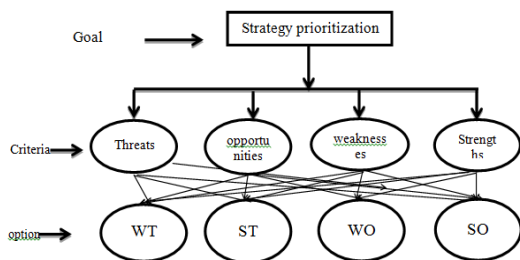

Figure 3: Tree diagram of the hierarchical analysis process of prioritizing strategies in the field of organizing industries and manufacturers that are conflicting with urbanization

The evaluation of strategy prioritization based on the AHP model in the field of organizing industries and manufacturers that are conflicting with urbanization shows that the three highest priority strategies are as follows:

1. ST1: Achieving specialized industrial clustering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed

2. ST2: Providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries

3. ST3: Encouraging and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives and facilities

These three strategies with the scores of 0.091, 0.090, and 0.088, respectively, are all of type ST and must be considered as the top three priorities when it comes to the implementation of the planned organization. The remaining strategies are prioritized as follows:

4. SO2: Providing the basis for the liberation of industrial zones for relocation and increasing their economic value as incentives

5. SO1: Establishment and implementation of Tehran's indigenous and highly attractive industries in industrial zones

6. SO3: Industrial clustering and constructing industrial corridors in stable and highly attractive industries

7. ST5: Considering the proportionality of land prices of the new locations for industrial establishment with economic indicators of industries and manufacturers that need to be relocated

8. WT2: Considering spatial constraints for Industries established in the city that are not inclined towards having a knowledge base and an active research and development center

9. WO2: Improving the knowledge base of the city's indigenous industries to reduce the negative consequences of their establishment

10. WO1: Creating balance and proportionality between negative-eliminative and adaptive-stability approaches due to the presence of a diverse range of conflicting and heterogeneous urban industries

11. WT3: Preventing the establishment of dependent non-urban industries in the vicinity of large-scale non-urban industries that do not need relocation

12. ST4: Development of special and case-by-case action plans for large-scale state-owned industries

13. WO3: The formation of specialized industrial clusters in places that are considered for the relocation of industries

14. WT1: Considering the effectiveness of the level of conflict and heterogeneity of intermediate industries and workshops in determining their method of organization

A complete list of the strategies with their priority is given in Table 6.

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Table 5: multiplication of the average weight of the options matrix in the weight of the criteria to calculate the final score of each strategy.

Strategies																				Final score
ST4	0.0010	0.0039	0.0039	0.0015	0.0007	0.0014	0.0047	0.0038	0.0026	0.0014	0.0017	0.0089	0.0003	0.0041	0.0017	0.0022	0.0024	0.0097	0.0015	0.057
WO2	0.0038	0.0013	0.0038	0.0003	0.0007	0.0044	0.0046	0.0009	0.0062	0.0015	0.0017	0.0017	0.0015	0.0040	0.0074	0.0021	0.0024	0.0085	0.0074	0.064
ST5	0.0010	0.0012	0.0060	0.0003	0.0007	0.0014	0.0084	0.0009	0.0012	0.0077	0.0017	0.0017	0.0015	0.0041	0.0017	0.0022	0.0132	0.0107	0.0014	0.067
SO3	0.0010	0.0037	0.0062	0.0016	0.0034	0.0044	0.0031	0.0009	0.0068	0.0015	0.0003	0.0100	0.0016	0.0037	0.0078	0.0101	0.0024	0.0019	0.0091	0.079
WT2	0.0037	0.0043	0.0040	0.0003	0.0033	0.0014	0.0105	0.0039	0.0066	0.0015	0.0003	0.0017	0.0014	0.0007	0.0078	0.0021	0.0023	0.0020	0.0083	0.066
SO2	0.0036	0.0038	0.0037	0.0015	0.0007	0.0014	0.0201	0.0009	0.0072	0.0014	0.0003	0.0091	0.0002	0.0007	0.0016	0.0021	0.0133	0.0114	0.0014	0.085
ST2	0.0042	0.0021	0.0077	0.0003	0.0007	0.0014	0.0208	0.0009	0.0012	0.0080	0.0017	0.0017	0.0015	0.0043	0.0017	0.0022	0.0143	0.0117	0.0037	0.090
ST3	0.0010	0.0039	0.0020	0.0016	0.0040	0.0014	0.0031	0.0070	0.0063	0.0093	0.0003	0.0089	0.0003	0.0007	0.0128	0.0115	0.0024	0.0019	0.0098	0.088
WT1	0.0010	0.0008	0.0020	0.0003	0.0006	0.0014	0.0031	0.0070	0.0012	0.0015	0.0003	0.0017	0.0003	0.0007	0.0133	0.0120	0.0024	0.0019	0.0014	0.053
WT3	0.0088	0.0008	0.0020	0.0003	0.0008	0.0066	0.0031	0.0009	0.0012	0.0050	0.0003	0.0016	0.0003	0.0007	0.0070	0.0135	0.0023	0.0019	0.0014	0.059
WO3	0.0044	0.0008	0.0020	0.0003	0.0008	0.0107	0.0031	0.0036	0.0012	0.0015	0.0003	0.0017	0.0003	0.0007	0.0023	0.0140	0.0024	0.0019	0.0015	0.053
SO1	0.0010	0.0008	0.0126	0.0003	0.0008	0.0013	0.0213	0.0010	0.0012	0.0091	0.0003	0.0017	0.0003	0.0007	0.0022	0.0021	0.0143	0.0116	0.0014	0.084
ST1	0.0045	0.0008	0.0121	0.0003	0.0008	0.0014	0.0211	0.0009	0.0012	0.0093	0.0003	0.0017	0.0003	0.0040	0.0023	0.0021	0.0135	0.0131	0.0015	0.091
WO1	0.0010	0.0017	0.0020	0.0014	0.0022	0.0013	0.0031	0.0071	0.0062	0.0014	0.0005	0.0078	0.0003	0.0007	0.0103	0.0021	0.0023	0.0019	0.0101	0.063

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Table 6: Prioritization of strategies in the field of organizing conflicting industries and manufacturers go District 21 of Tehran Municipality

Strategy code	Strategy of organizing industries and manufacturers description	Weight obtained from AHP	Priority
ST1	Achieving specialized industrial clustering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed	0.091	1
ST2	Providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries	0.090	2
ST3	Encouraging and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives and facilities	0.088	3
SO2	Providing the basis for the liberation of industrial zones for relocation and increasing their economic value as incentives	0.085	4
SO1	Establishment and implementation of Tehran's indigenous and highly attractive industries in industrial zones	0.084	5
SO3	Industrial clustering and constructing industrial corridors in stable and highly attractive industries	0.079	6
ST5	Considering the proportionality of land prices of the new locations for industrial establishment with economic indicators of industries and manufacturers that need to be relocated	0.067	7
WT2	Considering spatial constraints for Industries established in the city that are not inclined towards having a knowledge base and an active research and development center	0.066	8
WO2	Improving the knowledge base of the city's indigenous industries to reduce the negative consequences of their establishment	0.064	9
WO1	Creating balance and proportionality between negative-eliminative and adaptive-stability approaches due to the presence of a diverse range of conflicting and heterogeneous urban industries	0.063	10
WT3	Preventing the establishment of dependent non-urban industries in the vicinity of large-scale non-urban industries that do not need relocation	0.059	11
ST4	Development of special and case-by-case action plans for large-scale state-owned industries	0.057	12
WO3	The formation of specialized industrial clusters in places that are considered for the relocation of industries	0.053	13
WT1	Considering the effectiveness of the level of conflict and heterogeneity of intermediate industries and workshops in determining their method of organization	0.053	14

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5 - Conclusion

Nowadays, there is no other way to achieve sustainable development, social welfare, and high quality of life for the citizens other than achieving homogeneity between industrialization and urbanization. In fact, in order to have sustainable urban development, instead of emphasizing on the separation of industrial sites from cities, it is more recommended to create homogeneity between the urban environment (physical or social structure of urbanization) and industrial sites by the means of technology, development of physical arrangements, expansion of urban design and spatial organization, increase of environmental awareness and publications, strengthening urban planning and management, etc.(GolMohammadi, 2014: 36). Therefore, providing an optimal model appropriate to urban conditions, on the basis of sustainable development, is an undeniable necessity. Thus, in this study, in order to organize conflicting industries and manufacturers, a strategic planning model is used in the form of developing, determining, and prioritizing strategies by determining opportunities, possibilities, and threats. The results obtained from the strategic analysis of the organization of conflicting industries and manufacturers in District 21 of Tehran using the hybrid AHP-SWOT model are as follows.

The evaluation of internal factors (IFE) showed that strengths in this area outweighed weaknesses. In other words, the city of Tehran is strong in organizing conflicting industries and manufacturers in terms of internal factors, which requires serious attention and comprehensive planning by the corresponding custodians.

The evaluation of external factors (EFE) showed that the city is facing environmental challenges in the field of organizing conflicting industries and manufacturers.

In other words, the city has not been able to take advantage of the factors that create opportunities and avoid the factors that cause threats.

The Internal and External Matrix (IE) and the determination of strategies for the organization of conflicting industries and manufacturers indicate that there should be an emphasis on diversification (contingency) strategies in order to use the internal strengths of the industries to prevent the negative effects of the external threats related to the area. In other words, it is essential to plan on the identified threats and minimize them by taking advantage of the strengths and opportunities. The fact that there should be more emphasis on diversification strategies indicates that District 21 of Tehran is in a relatively good situation in terms of organizing conflicting industries and manufacturers. Therefore, the corresponding officials in District 21 of Tehran must pay attention to reducing the existing threats by taking advantage of the existing strengths in the field of organizing industries and manufacturers.

Furthermore, the evaluation of strategy prioritization for organizing industries and manufacturers in District 21 of Tehran based on the AHP model showed that the highest priority strategies are "achieving specialized industrial clustering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed", "providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries", and "encouraing and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives

and facilities" with final scores of 0.091, 0.090, and 0.088, respectively. All three of the mentioned strategies are of type ST and should be considered as the highest priority strategies in the implementation of organizing conflicting industries and manufacturers of District 21 of Tehran. The remaining eleven strategies are prioritized as shown in Table 6.

References:

1- Ostersovsky, Waterslaw (1999). "Contemporary town planning: From the origins to the Athens Charter"; translated by Laden Etezadi; Tehran: Vol. 2, University Publishing Center.

2- Papoli Yazdi, Mohammad Hossein and Rajabi Sanajardi, Hossein (2007)«Theories of city and its surroundings", Samat Publications.

3- Ziari, Keramatollah: (2003), Urban land use planning, Yazd University Press, Yazd.

4- Tehran Municipality Industries and Businesses Organization Company (2008). "strategic planning of organizing businesses and industries"

5- Shakur, Ali Akbar; Khosravi, Dorna (2016). Prioritization of organizing conflicting urban businesses with a new approach to the case study of Shiraz, the 5th National Conference on Sustainable Development in Geography and Planning, Architecture and Urban Planning.

6- Shokooi, Hossein (1388). "New Perspectives on Urban Geography", Tehran, Vol. 1, Samat Publications.

7- Saberifar, Rostam (1999). "Rural Development from the perspective of Geographical-Spatial Theories" Jihad Dictionary, No. 220 and 221

8- Abdolmaleki, Mohammad; Hosseinzadeh, Nemat and Nasrollah Kalantari, Mohammad Reza (2015): Identification of polluting industries and businesses in Islamshahr for their future organization, the Second International Congress of Geography and Sustainable Development

9- Gholami, Mohsen (2016). Organizing conflicting urban uses of Shahid Rostami Boulevard in Mashhad, National Conference on Contemporary Challenges in Architecture, Landscape, and Urban Planning

10- Golmohammadi, Morteza (2015), Investigation, analysis, and organization of conflicting businesses in Tabriz metropolis (Case study: District 6 of Tabriz Municipality), Master's thesis, Department of Geography and Urban Planning, University of Tabriz.

11- Mohammadzadeh, Mina (2016). Organizing Urban Conflicting and Polluting Industries A Case Study of Islamshahr, 4th International Congress of Civil Engineering, Architecture and Urban Development

12- Tehran's Studies and Planning Center (2008) Presenting a Model for Organizing Sustainable Industrial Development in Metropolises with Emphasis on Tehran Metropolis in the Framework of Sustainable Industrial Development

13- Farnahad Consulting Engineers (1996), Preparation and Development of Rules and Criteria for Organizing Urban Industries and Businesses, Deputy of Coordination of Civil Affairs of the Ministry of Interior's Office of Civil Planning

14- Kohan Dezh Consulting Engineers (2016), "Organizing the Establishment System of Industries and the Relocation of Inconsistent Industries with Urban Function and Performance", Tehran City Studies and Planning Center

■ 25 ■

15- Berry, brian,J.L.Horton,& E.Frank; Geographic Perspectives on Urban System; New Jersey, USA, 1970.

16-Marcuse Peter James Connolly and et all(2009)/ Searching for the Just City/Debates in urban.

Article Summery

Problem specification :

District 21 of Tehran is considered as one of the most industrial areas of Tehran, which faces many problems in the field of urban management due to the location of numerous industries and heterogeneity in industrial uses. In this study, while evaluating and analyzing the current situation of District 21 of Tehran Municipality in the field of conflicting industries and manufacturers, efforts have been made to develop, determine and prioritize strategies for organizing these industries.

Research method :

The main object of this research is to achieve a practical method in organizing conflicting industries and manufacturers. To do so, a descriptive-analytic approach is taken. The method of this research is described as follows. First, by reviewing the resources, a theoretical framework has been developed. Then, District 21 of Tehran is analyzed using modern methods, ie strategic planning, through spatial analysis, using the hybrid AHP-SWOT model. This analysis is conducted in terms of conflicting industrial sites and manufacturing plants with consideration to their strengths, weaknesses, opportunities, and threats. Finally, the mentioned strategies are developed, determined, and prioritized.

The statistical population of this study consists of academic experts and experts and managers of executive institutions related to the subject. With the use of targeted sampling as the sampling method of this study, thirty experts were identified and a questionnaire was prepared and conducted.

Results and Discussion:

The strategic planning process of organizing industries and manufacturers conflicting with District 21 of Tehran was conducted in five steps using the hybrid AHP-SWOT model as follows.

In order to develop the strategies for organizing conflicting industries and manufacturers in Tehran and presenting development strategies in this field, their external and internal capabilities and limitations in the region were identified. To distinguish the most important of these external and internal factors to enter the internal and external evaluation matrix, a survey was taken from experts (including managers of executive organs and renowned professors in this field). After that, by using the hybrid AHP-SWOT model, a paired comparison of each of the internal and external factors was performed, and after determining the weight and rank of each factor, its final score was obtained. Next, by analyzing these scores, the four types of strategies were identified with the help of the SWOT matrix, and then based on the internal and external matrix, the type of each strategy was determined. Finally, the developed strategies were prioritized based on the AHP model.

Conclusion :

providing an optimal model appropriate to urban conditions, on the basis of sustainable development, is an undeniable necessity. Thus, in this study, in order to organize conflicting industries and manufacturers, a strategic planning model is used in the form of developing, determining, and prioritizing strategies by determining opportunities, possibilities, and threats. The re-

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sults obtained from the strategic analysis of the organization of conflicting industries and manufacturers in District 21 of Tehran using the hybrid AHP-SWOT model are as follows.

The evaluation of external factors (EFE) showed that the city is facing environmental challenges in the field of organizing conflicting industries and manufacturers. In other words, the city has not been able to take advantage of the factors that create opportunities and avoid the factors that cause threats.

The Internal and External Matrix (IE) and the determination of strategies for the organization of conflicting industries and manufacturers indicate that there should be an emphasis on diversification (contingency) strategies in order to use the internal strengths of the industries to prevent the negative effects of the external threats related to the area. In other words, it is essential to plan on the identified threats and minimize them by taking advantage of the strengths and opportunities. The fact that there should be more emphasis on diversification strategies indicates that District 21 of Tehran is in a relatively good situation in terms of organizing conflicting industries and manufacturers. Therefore, the corresponding officials in District 21 of Tehran must pay attention to reducing the existing threats by taking advantage of the existing strengths in the field of organizing industries and manufacturers.

Furthermore, the evaluation of strategy prioritization for organizing industries and manufacturers in District 21 of Tehran based on the AHP model showed that the highest priority strategies are "achieving specialized industrial clustering in the process of relocating industrial sites across Tehran and paying attention that the planned adjacency of similar industries in new locations is observed", "providing the practical management prerequisites, directing, and laying the groundwork for the homogenization and conflict resolution of urban industries", and "encouraging and guiding urban industries that are inclined towards commercializing technology and becoming more knowledge-based by offering financial and non-financial incentives and facilities" with final scores of 0.091, 0.090, and 0.088, respectively. All three of the mentioned strategies are of type ST and should be considered as the highest priority strategies in the implementation of organizing conflicting industries and manufacturers of District 21 of Tehran. The remaining eleven strategies are prioritized as shown in Table 6.

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