DEVELOPING AND RANKING THE STRATEGIES OF ZARAND POWER PLANT USING QUANTITATIVE STRATEGIC PLANNING MATRIX AND BEST-WORST METHOD

Leila Zangiabadi
Zarand Power Plant Company, Zarand, Kerman, Iran
Department of Industrial Engineering, Kerman Branch Islamic Azad University, Kerman, Iran,
leila_zangiabadi@yahoo.com
https://orcid.org/0000-0003-0615-3588

Seyed Hamed Moosavirad*
Department of Industrial Engineering, Faculty of Engineering, Shahid Bahonar University of Kerman
Kerman, Iran, s.h.moosavirad@uk.ac.ir
https://orcid.org/0000-0001-6359-8044

Bahare Farahbakhsh
Department of Industrial Engineering, Faculty of Engineering, Shahid Bahonar University of Kerman
Kerman, Iran, bahareh.farahbakhsh@yahoo.com
https://orcid.org/0000-0003-3928-308X

Mitra Mirhosseini
Energy and Environment Research Center, Shahid Bahonar University of Kerman
Kerman, Iran, m.mirhosseini@uk.ac.ir
https://orcid.org/0000-0002-7577-8138

Highlight
This research aims to develop the strategic plan for the Zarand power plant and rank the developed strategies.

Abstract
Developing the power plants in any country is considered an economic development strategy as it changes the country's market despite the competitive pressures. However, to grow the electricity market, policymakers need to evaluate the domestic Strengths, Weaknesses, Opportunities, and Threats (SWOT) of electric power plants. So, the necessity of a strategic plan for the power plants is inevitable to reach the goals such as eliminating the shortcomings, and meeting the desired criteria of an organization, such as more market share, acceptable profitability, customer satisfaction, increasing profit growth rate, and productivity through economic and cost-effective operations. Therefore, in this paper, the Zarand power plant in Iran is chosen as a case study to develop the associated strategies and rank them. A power plant strategic plan was generated by using a SWOT matrix. Then, the developed strategies were prioritized using a quantitative strategic planning matrix (QSPM) and the best-worst method (BWM). The results confirm that developing the main product (electricity power), managing water consumption, and providing equipment are the most critical strategies for the Zarand power plant. Findings also demonstrated that the results of the BWM method are more accurate and correct than the QSPM method for prioritizing strategies.

Introduction

Today we see a lot of rapid changes in different environments- the changes which create challenges for organizations that are interdependent upon these environments and changes. These challenges make concerns for managers to achieve organizational goals to respond these changes. So, the researchers have used strategic planning as an influential tool for dealing with the challenges in management. Private and public enterprises use strategic management extensively to withstand the onslaught of market competition and environmental change. The complexity and delicacy of business decision-making make strategic management essential. The research

shows that 70 - 90% of the developed strategies failed in the implementation phase. Therefore, the implementation of strategy is more complicated than the development of good strategy [1]. The most significant problems that led to the development and popularization of the strategic management perspective in the historical planning were the environmental conditions and the resulting changes in the competitive market, and the need for aligning the operating systems with the chosen strategy to survive under such conditions [2]. Without a strategy as a management tool, there is no guideline for exploring new chances. So, the organization either passively waits for an opportunity or uses a shot in the dark technique [3].

Strategic planning gives the manager a clear picture of the organization and its goals and coordinates its activities. So, technological, social, and political changes, the complexity of the organization's external environment, the organization's extensive and numerous relationships with the environment and the longevity of the connections have made strategic planning necessary, and inevitable for the organization. In the rest of this section, the previous research, and studies in this field are briefly reviewed. In a study, to strategically plan marketing and select the appropriate strategy, Samadi and Fakher applied the Analytical Hierarchy Process (AHP) technique for Ahvaz Pipe Manufacturing Company in 2009 [4]. Another study was conducted by Amini et al. [5] to design and formulate the strategy of the North Drilling Company. Some tools such as the Internal and External Factor Evaluation (IFE and EFE) matrix, and the Strengths, Weaknesses, Opportunities, Threats (SWOT) matrix have been used in this [5]. In 2010, Hosseini and Shakhsian studied the factors affecting the strategy development of low-cost airlines using the SWOT matrix and Friedman test [6]. In another study, Salmani and Paleshi formulated the strategic planning of Sanat Choob Shomal Company to monitor and analyze the long-term goals of the company using strategic planning techniques such as internal factors (weaknesses and strengths) and external factors (threats and opportunities) and evaluate and propose appropriate strategies to achieve these goals [7]. Regarding EFE and IFE matrices in the input stage, they extracted the Internal External Matrix (IEM) [7].

Then, they identified different strategy options and prioritized them by the quantitative strategic planning matrix (QSPM) using the IEM and the SWOT matrices and information obtained from the statistical population of the matrix at the decision-making stage [7]. In 2016, Shahsavari and Moosavirad drew up a strategy map for the power installation company, one of the subsidiaries of the Mapna Group [8]. The combination of the SWOT, QSPM, and DEMATEL methods was used in their research [8]. In another study, Bagheri and Safaei formulated and prioritized human resource strategies in a telecommunications contractor company using the SWOT matrix and Balanced Score Card (BSC) [9]. In the field of transportation, using a combination of the SWOT and QSPM approach, the strategies to improve the position of the urban transportation system in the Shahrekord were developed and ranked [10]. In 2009, Wickramasinghe and Takano described a Sri Lankan tourism case study as a systematic approach and analytical tool for tourism revitalizing and strategic marketing planning, using a combination of the SWOT matrix and AHP [11]. In 2016, Shi assessed the competitive landscape for power integration at the Association of Southeast Asian Nations [12]. In their research, the strengths, weaknesses, opportunities, and threats developing green power were explored by using the SWOT analysis method. Kumar and Singh explored the impact of COVID-19 on the Agrifood Supply Chains (AFSC) and the possible strategies for improving the resilience of the AFSC [13]. They used the Best-Worst Method (BWM) for rating the importance of the identified strategies. In another research, the strategic plan of the beauty service industry in South Korea was developed using the SWOT method, and the AHP [14]. They found that the beauty service industry must deal with financial problems and employee stress [14]. Aliewi et al. also explored strategic management options for desalination using MCDM analysis in Kuwait [15]. They evaluated and tagged different management and policy options at the strategic level for the security and sustainability of water resources in the future for using all water users in Kuwait. The reuse wastewater for agricultural purposes was investigated in their research using MCDM techniques [15]. In 2017, Niu et al. explored the relationship between coal use and air pollution by proposing a practical Electric Power Substitution (EPS) mechanism. Finally, they explored EPS markets and policies. They used the SWOT method to investigate the strengths and weaknesses, opportunities, and threats of using EPS [16]. A study was conducted to prioritize the renewable power propellants in Iran using the Delphi- DEMATEL combined approach and network (fuzzy) analysis [17]. The "technological capability" and "political strength" propellants were considered the essential propellants to develop future scenarios about renewable power as well as strategic plan creation [17]. In another study at the Great Tehran Electrical Distribution Company, the operating strategies include power supply development, standardization of methods and processes, organizational development, and leadership style [18]. Finally, operational agility was extracted using the SWOT model. Then, the risks affecting the strength of electricity distribution and strengthening relationships with customers were identified using the ANP method in the same study [18]. Strategic factors in the Fars Province Power Distribution Company were ranked with the Fuzzy BWANP method by researchers [19]. Recently, research presented five suggestions to the organizations for their strategic planning [20]. The first suggestion was to consider their desired

characteristics in their vision and mission statements. The second suggestion was the application of Actionable, Quantitative, Comparative, and Divisional (AQCD) factors for analyzing SWOT. The third one was the usage of different sources for gathering the required information. The fourth one was the prioritization of the developed strategies by using QSPM. The final suggestion was to use software such as Excel in the strategic planning. Strategic thinking is no longer an option, but a necessity that guarantees the survival and success of an organization [21]. Due to the limitation of organizational resources, policymakers need to prioritize the implementation of their strategies [22]. Developing the country's power plants is undoubtedly considered a strategy for the country's economic growth. Also, it is a necessity because the domestic markets will be changed in the coming years, despite competitive pressures. Therefore, the need to develop a strategic plan for the Zarand power plant in Iran is fully felt to approach the goals that, while eliminating shortcomings, meet the desired criteria of an organization, such as more market share, acceptable profitability, customer satisfaction, increasing profit growth rate, and productivity through economic and cost-effective operations. According to previous articles and research, the BWM has not been used to rank the strategies. In the present study, the Zarand power plant strategic plan is generated. Then, the strategies of the power plant are prioritized using the QSPM and BWM.

This paper is structured as follows: The second section presents the research methodology for determining the best strategies using the QSPM and the BWM. Then, the results of this research are discussed in the third section. Finally, the conclusions and future suggestions are expressed in the fourth section.

Methods

To formulate the strategic planning of the Zarand power plant, first, the mission statement of the Zarand power plant was identified. According to Figure 1, the strengths, weaknesses, opportunities, and threats of the organization need to be identified and analyzed by IFE, and EFE at the input stage. Then, Internal External Matrix (IE) and Evaluation Matrix Strategic Position and Action (SPACE), and SWOT matrix need to be used by the strategic committee meetings for formulating the organizational strategies. SWOT analysis can help policymakers identify their primary strategy for achieving their goals. However, when the number of identified strategies is considerable, prioritizing the strategy cannot be done by the SWOT method. To deal with this issue, scholars usually use QSPM by weighting criteria [23–27]

Figure 1. Comprehensive strategy formulation framework [22]

For prioritizing strategies, different pairwise comparison-based methods can be applied [28]. One group of the pairwise comparison-based methods uses a single vector, such as QSPM, Swing, and SMART family methods [28]. The other pairwise comparison-based method uses a full matrix in its algorithm (e.g., AGH) [28]. However, each of them has its strengths and weaknesses. Although the one vector methods are very data and time-efficient, the consistency of the provided pairwise comparisons cannot be evaluated [28]. In contrast, the whole matrix methods can check the consistency of the provided pairwise comparisons, while they are not data and time-efficient. In other words, asking too many questions from the decision-makers in whole matrix methods can create confusion and inconsistency among the decision-makers. BWM - introduced in 2015 for weighting the criteria- stands in the middle of these two groups [28]. BWM is the most data and time-efficient method that can check the consistency of the provided pairwise comparisons. BWM has some similarities with the AHP method [29]. For instance, both questionnaires have pairwise comparisons, and both are set with a nine degrees spectrum. However, the AHP technique calculates $n \times (n-1)/2$ connections for the comparisons, but the BWM technique uses $(n-2) \times 2$ connections [29].

Thus, BWM, with fewer comparison data, has more consistent comparisons than AHP, which leads to reliable results. Therefore, in BWM, the respondent does not get bored. Therefore, according to managers' and experts' opinions in the power plant strategic committee, after prioritizing the strategies obtained using the QSPM and the BWM, the appropriate strategies for the Zarand power plant are proposed.

Determining the best strategies using QSPM

The most popular quantitative analysis method to prioritize the attractiveness of the proposed strategies is QSPM. In this method, it is possible to objectively identify various strategies among the best ones. The results and tables obtained in previous data entry and comparison stages are used to conclude the preparation strategies and to prepare and adjust the matrix [22].

The steps for preparing QSPM are presented as follows:

Step 1: The key opportunities and threats of the organization and its internal strengths and weaknesses obtained from the internal-external survey are written in the matrix. In this column, the primary factors that determine the success and failure of the organization are transferred directly from IFE and EFE to QSPM.

Step 2: Each opportunity, threat, strength, and weakness are weighted based on its importance. Therefore, the sum of opportunities and threats consequence equals one and the sum of strengths and weaknesses consequence equals one.

Step 3: The type of strategy is determined using the aforementioned methods in the methodology section. Then the strategy options related to the kind of strategy are presented.

Step 4: The attractiveness score of the strategy is achieved by each of the SWOT factors. In this step, the scores (1), (2), (3), and (4) are given to unattractive, somewhat attractive, sensible attractive, and very attractive, respectively.

Step 5: Calculate the sum of attractiveness scores.

Step 6: The total weighted scores are calculated, and the strategy with the highest weight scores is selected as the top strategy.

Determining the best strategies using BMW [29].

BWM includes the following steps:

Step 1: Determining a set of decision criteria.

Step 2: Determining the best (most desirable, most significant) and worst (most undesirable, least significant) criteria.

Step 3: Determining the importance of the best criterion compared to others, using a number between 1 and 9.

(1)
$$AB = (a_{B1}, a_{B2}, \ldots, a_{Bn})$$

Step 4: Determining other criteria's importance compared to the worst criteria, using a number between 1 and 9.

(2)
$$AW = (a_{1w}, a_{2w}, \ldots, a_{nw})$$

Step 5: Calculating the final weights of criteria $(W_1^*, W_2^*, \ldots, W_n^*)$ by solving the following optimization problem.

(3)
$$Min \; \xi$$
$$\left| \frac{W_B}{W_j} - a_{Bj} \right| \leq \xi$$
$$\left| \frac{W_j}{W_w} - a_{jw} \right| \leq \xi$$
$$\sum_j W_j = 1$$
$$W_j \geq 0 \; , \forall j$$

Results and discussion

According to the information obtained from the strategic committee meetings of the power plant, six main strengths, weaknesses, opportunities, and threats of SWOT of the company were finalized in Table 1.

Table 1. SWOT of the Zarand power plant.

Strengths (S)
S1 - Optimization, modernization, and technology change of systems
S2 - The efficiency of the power plant is increasing compared to the design efficiency.
S3 - Specialized and skilled human resources
S4 - Establishment of quality management systems (ISO9001, OHSAS 18001, ISO14001, HSE, ISO 10015, and Information Security Management (ISMS)) in the company
S5 - The company has suitable and improving computer systems and necessary and sufficient training is given.
S6 - Capability and experience in organizational management
Weaknesses (W)
W1 - The company is weak according to liquidity and has limited access to financial resources.
W2 - System wearing
W3 - High products cost due to low production capacity and machinery wearing
W4 - A high rate of domestic consumption to the extent of production
W5 - Leaving the service of experienced temporary contracts employees
W6 - A low ratio of specialized in-service training
Opportunities (O)
O1 - Strategic products (electrical power)
O2 - Electricity market monopoly
O3 - Government support policies in the supply sector
O4 - Government support policies in the development sector
O5 - The need of urban industries for technical capabilities, services, and by-products of the company
O6 - The power plant is important for maintaining the national electricity network strength in the country's southeast
Threats (T)
T1 - Lack of regional water resources
T2 - Low quality of extracted raw water
T3 - Economic sanctions on the supply of spare parts
T4 - Rising fuel prices due to the removal of subsidies from Power carriers
T5 - Laws of the Environment Organization to control environmental pollutants
T6 - Geographical location of the Zarand city and seismicity of the region and its effect on power plant production performance.

The influence of various internal and external factors has been challenged during the consequent meetings. Ultimately, the list of internal and external factors has been finalized and evaluated by the strategic committee members. The results of internal and external factors are presented in Tables 2 and 3. In these two tables, as mentioned, in addition to a list of internal and external influential factors, there are also columns for scoring and the importance of the factors. Total scores in each score table will be 0 - 4 with an average of 2.5.

As seen in Table 2, S1 - optimization, modernization, and technology change of systems, and S6 - capability and experience in organization management are the main strengths of the organization that need to be considered. In addition, W2 - system wearing, and W1 - the company is weak according to liquidity and has limited access to financial resources identified as the main weaknesses of the company.

Table 3 shows that O1 - strategic products (electrical power), and O4 - government support policies in the development sector are the main opportunities that need to be considered by the company. Moreover, T1 - lack of regional water resources, and T2 - low quality of extracted raw water are the major threats that need to be considered by the company.

Table 2. IFE Matrix (Strengths and Weaknesses).

Priority internal factors	Significance factor (0-1)	Rate (1-4)	Score (rank coefficient) (0-4)
S1- Optimization, modernization, and technology change of systems	0.109	4	0.436
S2- The efficiency of the power plant is increasing compared to the design efficiency.	0.054	3	0.162
S3- Specialized and skilled human resources	0.081	3	0.243
S4- Establishment of quality management systems in the company	0.081	3	0.243
S5- The company has suitable and improving computer systems and necessary and sufficient training is given.	0.081	3	0.243
S6- Capability and experience in organization management	0.108	3	0.324
W1- The company is weak according to liquidity and has limited access to financial resources.	0.108	2	0.216
W2- System wearing	0.108	3	0.324
W3- High products cost due to low production capacity and machine wearing	0.081	2	0.162
W4- A high rate of domestic consumption to the extent of production	0.081	2	0.162
W5- Leaving the service of experienced temporary contracts employees	0.054	1	0.054
W6- A low rate of specialized in-service training total score	0.054	2	0.108
Total score	1		2.677

Table 3. EFE Matrix (Opportunities and Threats).

Prioritized external factors	Significance factor (0-1)	Rate (1-4)	Score (rank coefficient) (0-4)
O1- Strategic products (electrical Power)	0.122	4	0.488
O2- Electricity market monopoly	0.097	3	0.291
O3- Government support policies in the supply sector	0.097	3	0.291
O4- Government support policies in the development sector	0.122	4	0.488
O5- The need of urban industries for technical capabilities, services, and by-products of the company	0.049	2	0.098
O6- The power plant is important for maintaining national electricity network strength in the southeast of the country	0.073	2	0.146
T1- Lack of regional water resources	0.122	3	0.366
T2- Low quality of extracted raw water	0.098	3	0.294
T3- Economic sanctions on the providing the spare parts	0.073	3	0.219
T4- Rising fuel prices due to the removal of subsidies from Power carriers	0.049	1	0.049
T5- Laws of the Environment Organization to control environmental pollutants	0.049	2	0.098
T6- Geographical location of the Zarand city and seismicity of the region and its effect on power plant production performance	0.049	2	0.098
Total score	2.926		1

Based on the internal-external evaluation matrix of the Zarand power plant and the scores of the evaluation matrices of internal factors and external factors, the strategic position of this organization is depicted in Table 4. According to Table 4, strategies for maintaining existing markets -with a focus on advertising and marketing to replace probably lost market share - and continuing to produce current products- with a focus on increasing the productivity and maintenance of facilities commonly used in this area. Consequently, the company's primary strategy is to develop the main product and expand its product availability and production in the Iranian electricity market.

Table 4. Internal- external factors evaluation matrix (IE)

			The final score of the IFE		
			weak	medium	strong
			1 - 1.99	2 - 2.99	3 - 4
The final score of the EFE	Strong	3 - 4	1	2	3
	Medium	2 - 2.99	4	5	6
	Weak	1 - 1.99	7	8	9

The factors affecting the company's activities were analyzed to determine appropriate strategies for the Zarand Power Generation Management Company. Ten main strategies were identified by taking the opinion of relevant experts and members of the strategic committee. Table 5 represents the proposed strategies such as main product development (electrical power), supply management of parts and equipment, water consumption management, fuel consumption management, power consumption management, and managing company expenses and income.

Table 5. Strategies of the Zarand Power Generation Management Company.

Strategy 1	Main product development (electrical power)
Strategy 2	Supply management of parts and equipment
Strategy 3	Water consumption management
Strategy 4	Fuel consumption management
Strategy 5	Power consumption management
Strategy 6	Managing company expenses and income
Strategy 7	Expansion of services and ancillary products
Strategy 8	Continue to implement and update quality management systems
Strategy 9	Attract and hire specialized and efficient human resource
Strategy 10	Holding specialized training

The strategic position of the company was also investigated by the SPACE chart. Table 6 shows that return on investment, liquidity power, and working capital are the main financial strengths of the company. Ease of entering the market and inflation are also identified as the major industrial and environmental strengths of the company, respectively. Finally, controlling the suppliers of raw materials and distributors of manufactured goods is presented as the most competitive advantage of the company. Based on the scores obtained from Table 6, Figure 2 shows that the company's position in the SPACE chart is conservative. In such a condition,

the organization must maintain its proper competencies and avoid exposing itself to risks. The most conservative strategies include market penetration and development, product development, and diversification.

Table 6. The internal and external strategic position of the Zarand power plant.

| Variables related to Financial Strengths (FS)	Score
Return on investment	4
Liquidity power	4
Working capital	4
Acquisition of fixed assets	3
Ease of exit from the market	1
Risk of trade	1
Grade point average	2.83
Variables related to Industrial Strengths (IS)	**Score**
Growth potential	3
Profitability	1
Financial strength	2
Necessary skills in technology	3
Use of resources	3
Ease of entering the market	5
Efficiency	3
Optimal use of capacity	4
Grade point average	3
Variables related to environmental strength (ES)	**Score**
Technological changes	-2
Inflation	-4
Change in demand	-1
Products prices of competing companies	-3
Barriers to market entry	-1
Competitive pressure	-3
Demand elasticity in terms of price	-2
Grade point average	-2.28
Variables related to Competitive Advantage (CA)	**Score**
Market share	-5
Products quality	-1
Life cycle	-1
Customer loyalty	-1
Ability to exploit competition	-5
Technical knowledge	-3
Controlling over the suppliers of raw materials and distributors of manufactured goods	-6
Average	-3.14
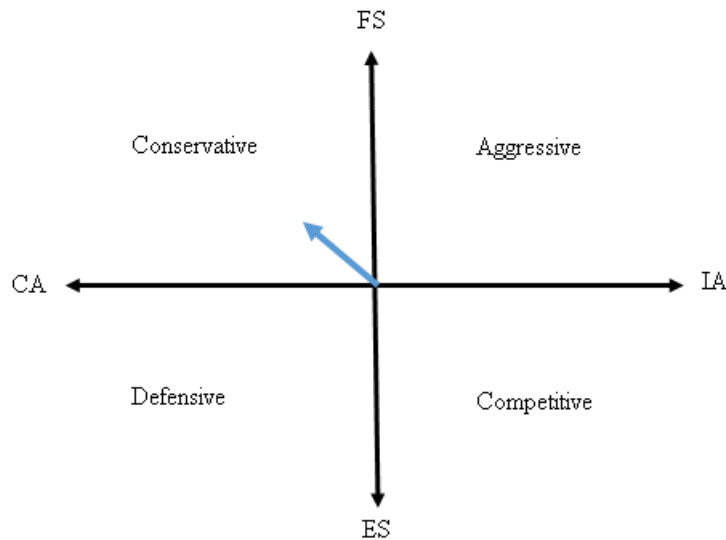
Figure 2. Company position on SPACE chart.

Prioritizing the developed strategies using QSPM

In QSPM, the quantitative factors and their significant weight are the same as the items' weights mentioned in the IFE and EFE. Attractiveness scores have been obtained by comparing strategies and internal and external important factors based on the opinion of the company's strategic committee members and the fitness of each strategy with each element, along with a logical reason.

The sum of attractiveness scores of determined strategies according to QSPM is a suitable criterion to choose among strategies. Accordingly, the prioritization for the proposed strategies is given in Table 7. Table 7 depicts that, based on the QSPM results, (1) main product development (electrical power), (2) management company expenses and income, (3) supply management of parts and equipment, (4) power consumption management, and (5) water consumption management are the top five strategies of the company.

Table 7. Prioritization of strategies with QSPM.

Strategy priority	Strategy description	Strategy score
1	Main product development (electrical power)	6.061
2	Management company expenses and income	5.9
3	Supply management of parts and equipment	5.324
4	Power consumption management	5.314
5	Water consumption management	5.063
6	Fuel consumption management	4.976
7	Attract and hire specialized and efficient human resource	4.368
8	Continuation of implementation and updating of quality management systems	4.315
9	Development of services and ancillary products	4.161
10	Holding specialized training	3.639

Prioritizing the developed strategies using BWM

After using the QSPM method for prioritizing the identified strategies, the priority of strategies was also investigated using BWM. Based on the BWM, Table 8 presents that (1) main product development (electrical power), (2) water consumption management, (3) supply management of parts and equipment, (4) managing company expenses and income, (5) power consumption management are the main five strategies that the company need to implement.

Table 8. Prioritization of the strategies based on the BWM.

Strategy priority	Strategy description	Strategy score
1	Main product development (electrical power)	0.269
2	Water consumption management	0.238
3	Supply management of parts and equipment	0.124
4	Managing company expenses and income	0.099
5	Power consumption management	0.075
6	Attract and hire specialized and efficient human resource	0.063
7	Fuel consumption management	0.056
8	Holding specialized training	0.030
9	Continue to implement and update quality management systems	0.028
10	Development of services and ancillary products	0.024

According to the results of both methods presented in Table 9, the main product development strategy was chosen as the most significant strategy in the Zarand Power Generation Management Company. Moreover, according to Table 9, the top five strategies of the company are similar in these two methods. However, only some of these strategies have different ranks in these two prioritizing methods. In addition, the conservative strategy that was found in this research for the company is similar to the network planning and maintaining strategy that was found for Tehran Electrify Distribution Company in Iran [18]. The importance of company expenses management and power consumption management strategies in current research are also similar to the findings of [19] for Fars Electricity Distribution Company.

Table 9. Comparison of prioritization through QSPM matrix and BWM method.

Strategy rating	Prioritization based on the QSPM matrix	Prioritization based on the BWM method
1	Main product development (electrical power)	Main product development (electrical power)
2	The company expenses and income management	Water consumption management
3	Providing equipment management	Providing equipment management
4	Power consumption management	The company expenses and income management
5	Water consumption management	Power consumption management
6	Fuel consumption management	Attraction and employment of specialized and efficient human resource
7	Attraction and employment of specialized and efficient human resource	Fuel consumption management
8	Continue to implement and update quality management systems	Holding applied specialized training
9	Developing the services and ancillary products	Continue to implement and update quality management systems
10	Holding special applied training	Development of services and ancillary products.

Impact

Secondly, due to the lack of regional water resources, and the low quality of extracted raw water, the power plant's managers need to manage the water consumption in the power plant. Thirdly, since Iran faced the economic sanctions on providing the spare parts, this power plant needs to have a robust plan for supplying its spare parts and equipment. Regarding the strategy of managing the company's expenses and income, the power plant needs to provide a road map for reducing its production cost associated with its human resources and maintenance, as well as an operational plan for increasing its income from the customers by reducing its equipment's shutdowns. Based on the power consumption management strategy, the power plant should balance the power consumption of customers during the pick and off-pick periods by different incentive plans.

According to the case study of the power plant, this study has regional impacts. By implementing a suitable strategy, a sustainable environment can be achieved in the future for this power plant. Ten strategies have been identified in this paper. Some strategies have environmental impacts, such as water consumption management and fuel consumption management strategies. Some identified strategies also have social effects, such as attracting and hiring specialized and efficient human resources, power consumption management, and holding specialized training strategies. Finally, the economic impacts of the proposed strategies can be seen in strategies such as managing the company's expenses and income and supply management of parts and equipment.

Due to the novelty of the decision-making method used in the present study, the proposed approach can help policymakers prioritize the strategies effectively in other case studies. In other words, the BWM applied in this study improved the strategy formulation framework 22 by efficiently reducing the vagueness of the whole decision-making process.

Conclusions

In this research, the primary strategy of the investigated power plant was identified in the area that the company needs to develop the main product and expand its product availability and production in the Iranian electricity market. Regarding to the reviewed articles, the novelties of current research are the application of the BWM method for ranking the power plants' strategies, as well as the combinational use of SWOT and QSPM, and BWM. As seen in the results section, the suggested ten strategies for the investigated power plant were prioritized by QSPM and BWM methods. The main product development strategy was chosen as the most significant strategy in this power plant. Moreover, the top five strategies of the company are similar in these two methods. However, only some of these strategies have different ranks in these two prioritizing methods. The results depicted that the best five selective strategies include main product development (electrical power), water consumption management, supply management of parts and equipment, managing company expenses and income, and power consumption management. Therefore, the company's managers must invest in the plan and implementation of the main suggested strategies.

In terms of time, this kind of strategic management requires a long time. Thus, the power plant must spend a lot of time on planning and implementing the prioritized strategies, as well as evaluating the impacts of these strategies on the power plant's performance. Therefore, it is recommended to investigate the effectiveness of the proposed strategies on the company's performance in the future. The results of this research can be applied in similar power plants with similar social, political, economic, and environmental conditions. Moreover, according to the dynamic and modification of companies' internal-external factors, the strategies need to be revised regularly by the presented approach for further study.

Due to the novelty of the BWM used in the present study, it is suggested that the proposed approach be used to prioritize strategy plans in other organizations and industries. Moreover, using fuzzy logic of the AHP method or a multi-objective genetic algorithm to select the proposed strategies, with the ability to calculate the outcome of a group of strategies and compare the simultaneous effect of several parameters to meet company goals, is a suitable tool in strategic planning. For future research, scholars can consider different economic, environmental, and social criteria associated with the strategies, such as the marginal profit, carbon footprint, water footprint, implementation period, and social adoption. Moreover, if there are different economic, environmental, and social criteria for ranking the strategies, other multi-criteria decision-making methods such as TOPSIS, VIKOR, ELECTRE, and PROMETHEE can be applied. Therefore, for further study, it is recommended to use other multi-criteria decision-making methods for prioritizing companies' strategies and compare the results with the findings of this research.

Conflict of interest

There are no conflicts to declare.

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