

## **FORMULATING AND CHOOSING STRATEGIES USING SWOT ANALYSIS AND QSPM MATRIX: A CASE STUDY OF HAMADAN GLASS COMPANY**

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### **Abstract**

*Glass industry is one of the largest and most important industries of the country. This industry is divided to several different groups which differ from each other in terms of production process and raw-material combinations. One of these groups is bottles and jars industry and Hamadan Glass Company is placed in this group. This research is a case study of this company and investigates its position in Iran's glass industry. In this paper, the process of formulating strategic planning is presented for this company and the way the proposed strategies are provided and organized is explained by applying strategic planning paradigms and evaluating internal and external environments. In this regard, SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and QSPM (Quantitative Strategic Planning Matrix) were used for producing strategies and their evaluation. At last, the proposed strategies were presented in the order of priority.*

### **Keywords**

*Strategic planning, SWOT analysis, TOWS matrix, QSPM, Glass container (Bottles & Jars)*

### **Introduction**

Strategic management can be defined as the art and science of formulating, executing and evaluating function decisions which enable organizations to reach their long-term objectives [1].

In fact, strategic management is a process through which organizations can recognize themselves and their surrounding environments and plan, implement and monitor their strategies. Strategic planning is considered as one of the most important duties of organization managers and, at present, because of the extent and speed of social and economic development and the increase in competitiveness, its importance is increasingly growing and all the organizations are compelled to consider it for their survival sooner or later. In this paper, first, Hamadan Glass Company is briefly introduced. Then, research methodology and the strategic planning process for the company are presented; the way the proposed strategies could be achieved for the company using strategic planning paradigms is explained and internal and external environments are evaluated.

### **An Overview of the Company**

Hamadan Glass Company (PLC) was established in 1975 by a donor from Hamadan and in cooperation with the former Industrial Credit Bank (currently, Bank of Industry and Mines) and was inaugurated in 1982. The intention was to create employment in the deprived Hamadan Province and to satisfy the packaging requirements of food and beverage industries. The plant was constructed on a land of 40 acres and on the 12th km of Hamadan-Tehran road. The company products include different types of bottles for packaging soda, juice, lime juice and vinegar and different types of jars for packaging pickles, sauce, olives and so on. The company products hold a share of about 33% of Iran's market. Moreover, a part of products are exported to Iraq, Azerbaijan and Turkmenistan. Unit I of this plant includes a melting furnace with the capacity of 170 Tons and four production lines equipped with I.S. (Individual Section)

machines. The annual production of this unit is 40000 Tons. This unit was reconstructed and renewed in 2004 and has modern machinery and is able to produce light and half-light glasses. Unit II of the plant was established in 1999 as the development plan with the capacity of 130 Tons and three production lines equipped with I.S. machines; the annual production of this unit is 30000 Tons. All the required raw materials are available in Iran and there is no dependence on imports from foreign countries. Also, since the company's products are voluminous, their import from other countries is not cost-effective, which can be an advantage against foreign competitors if Iran joins the World Trade.

### **Methodology**

The following stages are followed for strategic planning. At first, the organization's vision and mission statement are determined. Internal and external environments of the organization are analyzed and the obtained information specifies opportunities and threats (external factors) and strengths and weaknesses (internal factors). Then, using SWOT (TOWS matrix), the organizations' strengths, weaknesses, opportunities and threats are evaluated. In fact, this is used as an instrument for the systematic analysis of internal and external environments of an organization; Terrados et al. (2007) considered it as an effective instrument for identifying the problems and drawing lines of future actions [2]. Finally, QSPM matrix is used, which was considered in David et al. (2009) as an excellent and useful instrument for formulating the strategies based on internal and external evaluations and SWOT analysis. Among strategic alternatives, the relative importance of different facts, roles, tendencies and data may be determined in order to provide the advantages of an important competition for the company. QSPM provides a transparent framework for this prioritization process [3].

In this regard, after initial conversations were made and company managers asked the strategic advisory team to plan for the company, team members, chosen by consultation with the company director, started their activities. It is worth mentioning that no strategic planning has been conducted in this company so far. At first, it was essential to obtain the required information and an awareness of the industry which were accomplished by receiving different related resources from the company and doing research by team members. Then, the team developed the required questionnaires according to the obtained information. These questionnaires were mainly organized considering the company's conditions and following the strategic pattern model designed by Fred R. David. After that, the company's vision and mission statement were formulated by conducting supplementary interviews, distributing and gathering the organized questionnaires and holding different sessions with the members of board of directors, company director and experts. Mission statement has been considered the main factor of business success [4]. Strategy selection and evaluation were conducted in three session of: 1) input stage, 2) coordination and comparison stage and 3) decision-making stage and using different types of matrix including external factor evaluation matrix (EFE), internal factor evaluation matrix (IFE), competitive profile matrix (CPM), SWOT matrix, strategic position and action evaluation matrix (SPACE) and quantitative strategic planning matrix (QSPM) [1].

### **Mission & Vision statements**

At first, the company's vision and mission statements were determined, which is available at [www.hamadanglass.com](http://www.hamadanglass.com). Then, external and internal factors were identified and investigated.

### **External Factors Evaluation**

The objective of analyzing industries and examining environmental factors is to exploit opportunities and avoid threats. The forces which should be considered in this regard include: 1- economic forces, 2- environmental, ecological, cultural and social forces, 3- legal, governmental and political forces, 4- technological forces, and 5- competitive forces. It should be considered that external factors can influence various organization's activity process in different ways; that is, some factors which may be considered opportunities for an organization may be regarded as a threat for another organization and vice versa [1]. Table (1) shows the list of competing companies for Hamadan Glass Company and the comparative status

of this company. To observe ethics (observe the companies' legal rights), the names of these companies are demonstrated by alphabetic letters (A, B, C, D, E & F).

Table 1  
List of competitors and the company's comparative status

Company name	From 1992 To 1997		From 1998 To 2003		From 2004 To 2008	
	Average production capacity (ton)	Market share	Average production capacity (ton)	Market share	Average production capacity (ton)	Market share
HGC*	34500	24%	37402	24.8%	75000	33%
Company A	55200	38%	49205	32.7%	60000	26.4%
Company B	11400	8%	14067	9.4%	10000	4.4%
Company C	9000	6%	11959	8%	6000	2.7%
Company D	24500	17%	21325	14.1%	25000	11%
Company E	10800	7%	16478	11%	15000	6.6%
Company F	-	-	-	-	36000	15.9%
Total	145400	100%	150436	100%	227000	100%

(\*HGC: Hamadan Glass Company)

Also, Table (2) shows the list of the company's opportunities and threats which were collected after summarizing the questionnaires and then weighted during the discussions in the meetings. As can be seen, the company's important opportunities include the possibility of providing all the raw material from inside the country, changing trend of food consumption culture within the country, high shipping costs from overseas (which is a competitive advantage for the internal companies) and, at last, population growth. Also, the most important threats include replacing PET containers with glass containers in food and beverage industries, ongoing developments in competing companies and entry of new competitors, excessive annual increase of shipping fare inside the company for transporting raw materials and products and, finally, lack of access to refractory bricks and accessories, components and equipment, in case of sanctions by European countries (influenced by the political situation).

Table 2  
EFE matrix for Hamadan Glass Co.

External Factors	Weight	Rating	Score
Opportunities:			
Changing the culture of food consumption from traditional to industrial products	0.1	3	0.3
Population growth	0.1	3	0.3
Export to neighboring countries	0.05	3	0.15
Possibility of supplying all the raw materials from inside the country	0.15	4	0.6
Cost-ineffectiveness of glass import because of high shipping cost due to the products' bulkiness	0.1	3	0.3
Threats:			
Replacing PET containers with glass containers in food and beverage industries	0.15	2	0.3
The ongoing developments of competing companies and entry of new competitors	0.1	2	0.2
Excessive annual increase of shipping fare for transporting raw materials and products	0.05	2	0.1
Lack of access to refractory bricks and accessories, components and	0.15	1	0.15

equipment in case of sanctions			
Being affected (being influenced) by economic conditions of food industries in terms of packaging glass industry as an intermediate good	0.05	1	0.05
Total	1	-	2.45

### Internal Factor Evaluation

The objective of recognizing the industry's inside environment is to recognize an organization's internal strengths and weaknesses. The factors which should be considered in this regard include: 1- management and its structure, 2- sales and marketing, 3- finance and accounting, 4- research and development, 5- competitive forces, and 6- manpower. Table (3) demonstrates the company's strengths and weaknesses for evaluation. They were obtained after summarizing the questionnaires and then weighted during discussion sessions. As can be seen, the company's appropriate research and development unit and its modern and advanced machinery in Unit 1 are considered the most important strengths and, on the other hand, poor liquidity and lack of production experts who are at the level of European experts are the main weaknesses.

Table 3  
IFE matrix for Hamadan Glass Co.

Internal Factors	Weight	Rating	Score
Strengths:			
Research and development unit	0.2	4	0.8
Experienced managers	0.05	4	0.2
Modern, up-to-date and advanced machinery in the plant's Unit 1	0.15	4	0.6
The plant's large area of land (40 acres)	0.05	2	0.1
Enjoyment from the silica mine in the city of Abhar	0.05	3	0.15
Weaknesses:			
Problem of liquidity (lack of sufficient working capital)	0.15	3	0.45
Lack of production experts who are at the level of experts in the European and advanced countries	0.15	2	0.3
Old and surplus manpower	0.1	2	0.2
Old support equipment and facilities	0.05	1	0.05
Impossibility for the full settlement of maturity debt of the received facilities from the banking system	0.05	2	0.1
Total	1	-	2.95

### SWOT analysis

In this matrix, as its name reveals, first, the weaknesses and strengths and the factors identified as opportunities and threats are placed in a three-by-three matrix in a special order. Then, by combining weaknesses, strengths, opportunities and threats, new strategies are invented and placed in the blanks corresponding with these combinations [1], [5]. In the following table (Table 4), SWOT matrix is shown for Hamadan Glass Company using the investigations of internal and external factors (Tables 2 and 3). Below, all the strategies which are implementable for the company can be observed.

Table 4  
The TOWS matrix for Hamadan Glass Co.

	<b>Strengths:</b> - Research and development unit - Experienced managers	<b>Weaknesses:</b> - Problem of liquidity (lack of sufficient working capital)
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	<ul style="list-style-type: none"> <li>- Modern, up-to-date and advanced machinery in the plant's Unit 1</li> <li>- The plant's large area of land (40 acres)</li> <li>- Enjoyment from the silica mine in the city of Abhar</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of production experts who are at the level of experts in the European and advanced countries</li> <li>- Old and surplus manpower</li> <li>- Old support equipment and facilities</li> <li>- Impossibility for the full settlement of maturity debt of the received facilities from the banking system</li> </ul>
<b>Opportunities:</b> <ul style="list-style-type: none"> <li>- Changing the culture of food consumption from traditional to industrial products</li> <li>- Population growth</li> <li>- Export to neighboring countries</li> <li>- Possibility of supplying all the raw materials from inside the country</li> <li>- Cost-ineffectiveness of glass import because of high shipping cost due to the products' bulkiness</li> </ul>	<b>SO Strategy:</b> <ul style="list-style-type: none"> <li>- Establishing Unit 3 for producing colored bottles (<math>S_1, S_4, S_5, O_1, O_2, O_3, O_4, O_5</math>)</li> </ul>	<b>WO Strategies:</b> <ul style="list-style-type: none"> <li>- Creating a unit of crushing and arranging silica (<math>W_3, O_4</math>)</li> <li>- Renewing support equipment and facilities (<math>W_4, O_3</math>)</li> </ul>
<b>Threats:</b> <ul style="list-style-type: none"> <li>- Replacing PET containers with glass containers in food and beverage industries</li> <li>- The ongoing developments of competing companies and entry of new competitors</li> <li>- Excessive annual increase of shipping fare for transporting raw materials and products</li> <li>- Lack of access to refractory bricks and accessories, components and equipment in case of sanctions</li> <li>- Impossibility for the full settlement of maturity debt of the received facilities from the banking system</li> </ul>	<b>ST Strategies:</b> <ul style="list-style-type: none"> <li>- Cooperating with a transportation company (<math>S_2, T_3</math>)</li> <li>- Creating the culture of using glass bottles instead of PET for packaging through Consumers Awareness and Environmental Protection Organization (<math>S_1, S_5, T_1</math>)</li> </ul>	<b>WT Strategies:</b> <ul style="list-style-type: none"> <li>- Increasing the capital through the shareholders' cash and paid interests for the shares (<math>W_1, W_5, T_2, T_3</math>)</li> <li>- Using legal benefits and early retirement regulations of the staff (<math>W_3, T_5</math>)</li> </ul>

### Evaluating and Prioritizing the Strategies

In this stage, it is required to select the best possible strategies from among the strategies that are implementable in the company, which are obtained using TOWS matrix analysis. This evaluation can be done using QSPM matrix [3]. The results of this examination about Hamadan Glass Company are given in Table (5).

Table 5  
QSPM for Hamadan Glass Co.

		WO-1		WO-2		SO-1		WT-1		WT-2		ST-1		ST-2	
Factors	Weight	AS	FAS	AS	FAS	AS	FAS	AS	FAS	AS	FAS	AS	FAS	AS	FAS
Op.1	0.1	1	0.1	1	0.1	4	0.4	-	-	-	-	-	-	1	0.1
Op.2	0.1	1	0.1	1	0.1	4	0.4	-	-	-	-	-	-	-	-
Op.3	0.05	1	0.05	2	0.1	3	0.15	-	-	-	-	2	0.1	-	-
Op.4	0.15	4	0.6	-	-	3	0.45	-	-	-	-	-	-	-	-
Op.5	0.1	1	0.1	-	-	3	0.3	-	-	-	-	-	-	-	-
Th.1	0.15	-	-	-	-	3	0.45	-	-	-	-	-	-	4	0.6
Th.2	0.1	2	0.2	-	-	4	0.4	2	0.2	2	0.2	3	0.3	3	0.3
Th.3	0.05	2	0.1	-	-	-	-	1	0.05	-	-	4	0.2	-	0.05
Th.4	0.15	-	-	3	0.45	4	0.6	2	0.3	-	-	-	-	-	-
Th.5	0.05	-	-	-	-	-	-	2	0.1	-	-	1	0.5	-	-

St.1	0.2	1	0.2	1	0.2	3	0.6	-	-	-	-	-	-	2	0.4
St.2	0.05	1	0.05	1	0.05	2	0.1	4	0.2	2	0.1	2	0.1	-	-
St.3	0.15	-	-	-	-	2	0.3	-	-	2	0.3	-	-	1	0.15
St.4	0.05	-	-	-	-	3	0.15	-	-	-	-	1	0.05	1	0.05
St.5	0.05	4	0.2	-	-	4	0.2	-	-	-	-	-	-	4	0.2
We.1	0.15	2	0.3	2	0.3	2	0.3	4	0.6	3	0.45	2	0.3	2	0.3
We.2	0.15	1	0.15	-	-	4	0.6	-	-	1	0.15	-	-	-	-
We.3	0.1	3	0.3	-	-	2	0.2	-	-	4	0.4	-	-	-	-
We.4	0.05	-	-	4	0.2	-	-	3	0.15	-	-	-	-	1	0.05
We.5	0.05	2	0.1	4	0.2	4	0.2	4	0.2	2	0.1	-	-	3	0.15
Total			2.55		1.7		5.8		1.8		1.7		1.1		2.35

(AS: Attractiveness Score; FAS: Final Attractiveness Score)

Considering the results of QSPM matrix , the priority of strategies are as follows:

- 1: Establishing Unit 3 for producing colored bottles,
- 2: Establishing a unit for crushing and arranging silica,
- 3: Creating the culture of using glass bottles instead of disposable plastic PET (Poly Ethylene Terephthalate) containers,
- 4: Increasing the capital through the shareholders' cash and paid interests,
- 5.1: Reconstructing and developing equipment and facilities,
- 5.2: Using benefits of the early retirement regulations for the old staff and employing new and experienced forces, and
- 6: Cooperating with a transportation company.

### Conclusion

Considering that strategic planning has not been done in the Hamadan Glass Company so far, such kind of plan was essential for the company. The results show that this industry is in an optimum condition and the company is in a good competitive situation; however, its financial situation is not desirable.

The strategies and their priorities were identified as follows:

The company's strategic advisory team identified "establishing a third unit for producing colored bottles" as the first and most important priority among other strategies.

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