Research on KR group's development strategy selection based on DELPHI-SWOT hybrid analysis model

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Abstract. Petroleum equipment manufacturing industry is an important indicator of a country's heavy industrial strength, and it is also the cornerstone of the development of the petroleum industry. Under the double influence of the international financial crisis and the sustained low oil price, the competition in the oil equipment industry is unprecedentedly fierce. On the basis of marketing, management and strategic management, PEST model and Porter's five-force model are used to analyze the macro-micro development environment, and then DELPHI-SWOT hybrid analysis model is used to sort out the internal and external factors that affect the choice of development strategy, and statistical research is carried out to get the development war suitable for KR Group. It provides guidance for the development of domestic and international markets, and provides reference for the same industry.

1. Introduction

As an international high-end petroleum equipment enterprise, KR gradually enlarges its overseas market share by virtue of its management ability, technology, capital and other advantages. However, the current international market purchasing power declines and labor costs rise caused by the continuing low oil prices, resulting in low efficiency of petroleum equipment enterprises. Since the 21st century, the support of the state to the Yellow River Delta and the proposal of the Blue and Yellow Strategy have played an important role in promoting the development of Dongying City. The governments at all levels have promulgated a number of policies to encourage the petroleum equipment manufacturing industry and the petroleum and natural gas industry, providing support for Dongying petroleum equipment enterprises to cope with the crisis. Based on this, this paper scientifically analyzes the development environment of KR Group through relevant theoretical models, and chooses the development strategy through the improved SWOT model, which can provide reference for KR Group and other enterprises in the same industry.

2. DELPHI-SWOT hybrid analysis model

PEST model is used to analyze the macro-political, economic, social, cultural and technological factors of enterprise development, and to describe the macro-development environment of enterprises. Michael Porter's "Five Forces Model" in the "Competitive Strategy" is a powerful tool for academia to analyze the competitive environment. It mainly discusses from five aspects: supplier, purchaser, existing competitor, potential competitor and substitute [1-2].

The DELPHI-SWOT hybrid analysis model is improved based on the traditional SWOT analysis. The traditional SWOT analysis belongs to pure qualitative analysis, which is not objective in the selection of factors or the strategies and strategies proposed on the basis of it [3]. The DELPHI-SWOT hybrid analysis model integrates the three environmental factors on the basis of

environmental analysis, and re-integrates them according to the SWOT perspective. The original scoring data is processed preliminarily with the help of expert scoring and standardized processing. Polar factors and negative factors score for different development strategies, mainly from the following aspects: the identification of the initial program, identification and classification of influencing factors, significant factors extraction, the choice of the best program and specific strategy selection.

3. Development environment analysis and strategy selection of KR group

This paper uses the PEST model and Porter's Five Forces model to analyze the development environment of KR Group. The contents are embodied in the following strategic choices. Then, on the basis of environmental analysis, DELPHI-SWOT hybrid analysis model is used to select the development strategy of KR Group.

3.1 Identification and classification of influencing factors

Based on the development environmental analysis of KR Group, we can classify its influencing factors into seven categories, and extract 47 indicators, of which 30 are external influencing factors, 19 are opportunity factors and 11 are threat factors; 17 are internal influencing factors, among which 8 are superior factors and 9 are inferior factors. See Table 1.

Table 1 Details of influencing factors and expert empowerment

Primary factor	Secondary factor	Variable number	Attribute	Secondary factor weighting					Average weight
				1	2	3	4	5	
Political factors	Government restrictions and interference	POL01	T	0.5	0.6	0.4	0.5	0.6	0.52
	Industry competition are tightening	POL02	T	0.6	0.7	0.6	0.8	0.6	0.66
	Good international political environment	POL03	O	0.8	0.8	0.7	0.8	0.6	0.74
	Domestic political stability	POL04	O	0.5	0.6	0.6	0.5	0.5	0.54
	Government supports enterprises to develop overseas markets	POL05	O	0.6	0.5	0.6	0.7	0.5	0.58
	Various awards in the petroleum equipment industry	POL06	O	0.8	0.7	0.9	0.7	0.8	0.78
	Harmony with local political economy	POL07	O	0.7	0.8	0.8	0.7	0.8	0.76
	National policy support for the petroleum equipment industry	POL08	O	0.8	0.7	0.7	0.8	0.9	0.78
Economic factors	The company's own financial strength is strong	ECN01	S	0.6	0.8	0.7	0.6	0.8	0.70
	Demographic dividend	ECN02	S	0.5	0.3	0.4	0.4	0.4	0.38
	International oil prices fluctuate greatly	ECN03	T	0.7	0.6	0.6	0.7	0.6	0.64
	The competition in overseas markets is grim	ECN04	T	0.7	0.7	0.6	0.8	0.8	0.72
	Unbalanced market development	ECN05	T	0.4	0.5	0.5	0.4	0.5	0.46
	High tax rate	ECN06	T	0.6	0.5	0.6	0.4	0.5	0.52
	global economic crisis	ECN07	T	0.6	0.5	0.6	0.5	0.6	0.56
	Prospects for oil and gas exploration equipment	ECN08	O	0.8	0.7	0.8	0.7	0.8	0.76
	Investing countries have great potential for demand	ECN09	O	0.7	0.8	0.7	0.7	0.6	0.70
	Investment security	ECN10	O	0.6	0.7	0.7	0.6	0.6	0.64
	Economic Globalization	ECN11	O	0.6	0.5	0.6	0.6	0.5	0.56
	Single financing channel	ECN12	W	0.5	0.5	0.6	0.6	0.5	0.54
Cultural factors	Great cultural background	CUL01	W	0.5	0.4	0.5	0.4	0.4	0.44
	Ethnic diversity	CUL02	W	0.4	0.3	0.3	0.4	0.3	0.34
	Customary diversity	CUL03	W	0.5	0.4	0.4	0.3	0.4	0.40
	Linguistic diversity	CUL04	W	0.5	0.4	0.3	0.3	0.4	0.38
	Different religions	CUL05	W	0.6	0.5	0.4	0.4	0.5	0.48
	Harmonious national relations	CUL06	S	0.6	0.5	0.6	0.5	0.5	0.54
Technological factors	Advanced petroleum equipment technology	TEC01	S	0.7	0.8	0.8	0.7	0.8	0.76
	Perfect marketing and after-sales service system	TEC02	S	0.6	0.7	0.7	0.6	0.7	0.66
	Adequate transportation infrastructure	TEC03	S	0.5	0.6	0.4	0.5	0.5	0.50
	Complete infrastructure	TEC04	S	0.6	0.6	0.5	0.5	0.5	0.54
	Less experience in overseas mergers and acquisitions	TEC05	W	0.7	0.7	0.8	0.6	0.7	0.70
Geographical factor	long distance	GEO01	W	0.7	0.6	0.6	0.5	0.5	0.58
	Belongs to two circles and four districts	GEO02	O	0.5	0.4	0.5	0.6	0.4	0.48
	Located in the area of Shengli Oilfield	GEO03	O	0.6	0.6	0.5	0.6	0.5	0.56
	Located in the Yellow and Blue Economic Zone	GEO04	O	0.6	0.5	0.5	0.6	0.5	0.54
Legal factors	Strict import and export laws and regulations	LEG01	T	0.5	0.4	0.3	0.4	0.4	0.40
	International foreign exchange management is strict	LEG02	T	0.4	0.3	0.4	0.3	0.3	0.34
	Petroleum equipment overseas project approval is strict	LEG03	T	0.6	0.5	0.6	0.5	0.6	0.56
	Country differences in laws and regulations	LEG04	T	0.4	0.5	0.4	0.4	0.4	0.42
	Domestic current loose monetary policy	LEG05	O	0.6	0.6	0.5	0.6	0.5	0.56
	Target countries' preferential policies for attracting foreigners	LEG06	O	0.5	0.6	0.5	0.5	0.5	0.52
Social factors	Urbanization work promotion	SOC01	O	0.4	0.4	0.3	0.4	0.4	0.38
	Investment environment improvement	SOC02	O	0.5	0.5	0.6	0.5	0.4	0.50
	Work and public assistance projects are easily accessible	SOC03	O	0.6	0.5	0.5	0.4	0.5	0.50
	Vehicle diversity	SOC04	O	0.5	0.4	0.3	0.3	0.4	0.38
	Traffic barrier	SOC05	W	0.4	0.3	0.2	0.3	0.3	0.30
	Highly educated and well-trained workers	SOC06	S	0.6	0.6	0.5	0.5	0.5	0.54

3.2 Classification and standardization of influencing factors

In Table 1, five industry experts are invited to rate each factor for each category, with a range of values from 0 to 1 and an increment of 0.1. Using DELPHI-SWOT hybrid analysis model, the importance weights listed in Table 1 are normalized by using formulas (1) and (2). The normalized weights of main factors are obtained. The total standard weights of positive factors (opportunities and advantages) and negative factors (threats and disadvantages) are 1 [3]. See Table 2.

$$X_i = \frac{x_i}{\sum_{i=1}^{m} x_i}, i = 1,2,...,m \tag{1}$$

$$Y_j = \frac{y_i}{\sum_{j=1}^{n} y_i}, j = 1,2,...,n \tag{2}$$

m and *n* are the number of positive and negative factors respectively.

Table 2 Variables and their standardization weight

Attribute	Variable number	Average weight	Standardization weight	Attribute	Variable number	Average weight	Standardization weight
S	ECN01	0.70	0.0441	W	ECN12	0.54	0.0542
	ECN02	0.38	0.0239		CUL01	0.44	0.0442
	CUL06	0.54	0.0340		CUL02	0.34	0.0341
	TEC01	0.76	0.0479		CUL03	0.40	0.0402
	TEC02	0.66	0.0416		CUL04	0.38	0.0382
	TEC03	0.50	0.0315		CUL05	0.48	0.0482
	TEC04	0.54	0.0340		TEC05	0.70	0.0703
	SOC06	0.54	0.0340		GEO01	0.58	0.0582
O	POL03	0.74	0.0466		SOC05	0.30	0.0301
	POL04	0.54	0.0340	T	POL01	0.52	0.0522
	POL05	0.58	0.0365		POL02	0.66	0.0663
	POL06	0.78	0.0491		ECN03	0.64	0.0643
	POL07	0.76	0.0479		ECN04	0.72	0.0723
	POL08	0.78	0.0491		ECN05	0.46	0.0462
	ECN08	0.76	0.0479		ECN06	0.52	0.0522
	ECN09	0.70	0.0441		ECN07	0.56	0.0562
	ECN10	0.64	0.0403		LEG01	0.40	0.0402
	ECN11	0.56	0.0353		LEG02	0.34	0.0341
	GEO02	0.48	0.0302		LEG03	0.56	0.0562
	GEO03	0.56	0.0353		LEG04	0.42	0.0422
	GEO04	0.54	0.0340	Total			1.0000
	LEG05	0.56	0.0353				
	LEG06	0.52	0.0327				
	SOC01	0.38	0.0239				
	SOC02	0.50	0.0315				
	SOC03	0.50	0.0315				
	SOC04	0.38	0.0239				
总计			1.0000				

3.3 Evaluation of pre-selection options

Invite experts to evaluate and score the pre-selection options, scoring range [0,5], "0" is unlikely to represent, "5" represents most likely, each positive factor's the best possible score is 5; by contrast, the ideal situation of negative factors is lower score, as shown in Table 3.

Table 3 Score and ideal score for five alternatives

Attribute	Variable number	Alternatives					Variable number	Alternatives					ideal score
		Stable	Integration	Exploratory	Cost leadership	Differentiation		Stable	Integration	Exploratory	Cost leadership	Differentiation	
S	ECN01	2.7	3.0	3.4	2.3	2.6	TEC02	2.5	2.5	2.8	2.3	2.0	5
	ECN02	2.1	2.0	2.3	1.8	1.9	TEC03	2.4	2.1	2.6	2.2	2.1	5
	CUL06	1.5	1.7	1.6	1.4	1.2	TEC04	2.8	2.5	2.9	2.1	2.3	5
	TEC01	3.0	3.1	3.4	3.0	3.1	SOC06	3.1	2.7	2.8	3.0	2.6	5
O	POL03	2.8	2.9	3.2	2.5	2.6	GEO02	2.2	2.0	2.3	2.0	2.1	5
	POL04	2.3	2.4	2.4	2.3	2.0	GEO03	2.4	2.3	2.5	2.3	2.2	5
	POL05	2.4	2.3	2.5	2.2	2.1	GEO04	2.5	2.6	2.7	2.4	2.4	5
	POL06	3.2	3.2	3.5	2.9	3.0	LEG05	2.5	2.3	2.4	2.3	2.2	5
	POL07	2.5	2.5	2.8	2.5	2.4	LEG06	2.5	2.2	2.1	2.3	2.1	5
	POL08	2.7	2.7	2.9	2.6	2.7	SOC01	1.8	2.0	2.1	2.0	2.1	5
	ECN08	3.2	3.4	3.6	3.2	3.3	SOC02	2.8	2.8	2.9	2.7	2.7	5
	ECN09	3.2	3.4	3.5	3.0	3.2	SOC03	2.1	1.8	1.9	2.0	1.8	5
	ECN10	3.0	3.2	3.4	2.8	2.9	SOC04	2.1	2.0	2.3	2.1	2.1	5
	ECN11	3.0	3.1	3.3	2.8	2.9							
W	ECN12	3.1	2.8	3.3	3.0	2.7	CUL05	1.6	1.8	1.7	1.5	1.8	0
	CUL01	1.6	1.4	2.0	1.7	1.5	TEC05	3.0	3.1	3.5	2.9	3.0	0
	CUL02	1.5	1.3	1.7	1.4	1.3	GEO01	2.1	2.0	2.2	1.8	1.9	0
	CUL03	1.5	1.4	1.6	1.4	1.3	SOC05	2.0	1.8	2.1	1.8	1.9	0
	CUL04	1.7	1.8	2.0	1.6	1.7							
T	POL01	2.6	2.8	3.2	2.2	2.0	ECN07	3.2	2.7	2.8	3.0	2.7	0
	POL02	3.1	3.2	3.4	2.4	2.4	LEG01	2.6	2.8	3.0	2.5	2.6	0
	ECN03	3.2	2.9	3.1	3.0	2.7	LEG02	3.0	2.7	2.8	2.9	2.5	0
	ECN04	3.2	3.1	3.5	3.0	3.2	LEG03	2.7	2.8	3.1	2.6	2.8	0
	ECN05	3.1	2.9	3.1	2.8	2.6	LEG04	2.5	2.7	2.8	2.3	2.4	0
	ECN06	2.9	2.6	2.7	2.9	2.5							

3.4 Selection of preselection options

According to Formula (3) and (4), the total score of OS, WT for each alternative can be obtained, as shown in Table 4. Finally, the Euclidean distance is obtained by using formula (5). The alternative with smaller Euclidean distance is closer to the ideal alternative.

$$W_{os} = \sum_{i=1}^{m} X_i \times K_i \tag{3}$$

$$W_{tw} = \sum_{j=1}^{n} Y_i \times L_i \tag{4}$$

$$D = \sqrt{\left(W_{os} - 5\right)^2 + \left(W_{tw} - 0\right)^2} \tag{5}$$

K_i is the average score of positive factors i, and L_j represents the average score of negative factors j.

Table 4 Program evaluation result

Alternatives	W_{os}	W_{wt}	D	Rank
Stable	2.624433249	2.602209	3.523465369	5
Integration	2.617884131	2.524297	3.470814358	2
Exploratory	2.823803526	2.779719	3.530250433	4
Cost leadership	2.461460957	2.413454	3.502704639	3
Differentiation	2.455163728	2.358635	3.469776439	1

3.5 Development strategy selection

Through DELPHI-SWOT analysis, KR group should choose differentiated development strategy. Differentiation strategy is a kind of strategy which has certain advantages compared with competitors and provides differentiated products and services in the same or different market segments.

3.6 Differentiated development strategy of KR group

1. Products: In the process of research and development of products, KR Group should pay attention to depth and continuously innovate and optimize product types.

2. Price: KR Group should adopt differentiated pricing method, based on product cost pricing, and formulate price based on user's understanding of product value and supply status.

3. Channel: KR Group should differentiate its development market. According to the resources of all links in the original supply chain of the enterprise, we will continue to explore international markets.

4. Promotion: KR Group should adopt differentiated promotion strategies, cooperate with publishers, occupy newspaper headlines, and raise awareness.

4. Summary

This paper systematically and comprehensively analyzes the internal and external factors influencing the development of KR Group, and combines PEST model, Porter's Five Forces model and DELPHI-SWOT hybrid analysis model to study. Through European distance, it is concluded that KR Group should choose differentiation development strategy under the environment of sustained low oil price and fierce competition space, and discusses its development strategy. The differentiated development strategy provides a reference for KR group and the same industry.

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