COIA 2018

PROCEEDINGS

of the
6th International Conference on

CONTROL AND OPTIMIZATION
WITH INDUSTRIAL APPLICATIONS

Volume II

11-13 July, 2018
Baku, Azerbaijan

C◯IA
2◯18

The 6th International Conference on Control and Optimization with Industrial Applications, 11-13 July, 2018, Baku, Azerbaijan

MODEL OF ANALYSIS AND EVALUATION AND RATIONAL CHOICE OF ENTERPRISE DEVELOPMENT STRATEGY

NAZIM HAJIYEV[1],[2], AL SALAIMEH SAFWAN[3]

[1]Azerbaijan State University of Economics (UNEC), Baku, Azerbaijan
[2]Davis Center for Russian and Eurasian Studies, Harvard University, Boston, USA
[3]Information technology Faculty, Aqaba University of Technology, Aqaba, Jordan
e-mail: n.hajiyev@unec.edu.az, nazimhajiyevaz@gmail.com, ssalaimeh@aut.edu.jo

ABSTRACT. The strategy of enterprise is the aggregated preplan document, establishing insufficient long periods of time the strategic objective of the enterprise. This paper discusses the issues of development model of strategic management of food industry development based on [1]. The results of the work are shown in the model (3).

Keywords: Analysis, evolution, rational choice, enterprise, development strategy.

AMS Subject Classification: 62P20, 91B26.

1. INTRODUCTION

Under the strategy of enterprise development, we will understand the aggregated preplan documents, establishing insufficient long periods of time the strategic objective of the enterprise, aggregate of sub goals, directions and sphere of activity, implementation of which leads to achievement of strategic goals defining task of business units and ways to solve them.

2. PROBLEM FORMULATION

Let's go to a formal description of the company's strategy and the corresponding models of rational choice. We denote by the strategic goal of the enterprise, which will be determined as quantities, both qualities. Let $s = \{S_v, \ v \in N\}$ – set of alternative strategy of the enterprise providing achievement of strategic goals T, where N- many size of strategies. Based on the principles of hierarchical decomposition, a strategic goal T decompose into many sub goals $\{T_k, \ k \in K\}$, where $k = set$ number of sub goals for the enterprise. We will assume that within the strategy S_v can be implemented many sub goals $K_v \subseteq K$, i.e. $S_v \Rightarrow \{T_k, \ k \in K\}$.

Let's call k^{th} functional strategy S_v aggregated preplanning document that defines the strategic sub goals of the enterprise for not sufficiently large periods of time, tasks for its achievement and way to solve them. Next kth functional strategy S_v will be denoted by FS_v^k, where $k \in K_j$. For some enterprise can be considers functional strategies in marketing (range, distribution, advancement), production (technology, bandwidth), supply (suppliers, delivery) and others.

3. PROBLEM SOLUTION

Each strategic sub goals of the enterprise we will put in accordance a functional strategy. For each functional FS_v^k considering a lot of tasks, which should be solved $\{P_{vi}^k, \ i \in I_v^k\}$ where I_v^k- corresponding set number of the task of the functional strategy.

We will assume that each task P_{vi}^k can be solved in variety of ways $\{W_{vi\mu}^k, \ \mu \in M_{vi}^k\}$, where M_{vi}^k- corresponding set numbers of ways. For example, if the task is to increase the capacity of certain division of the enterprise, then many ways of the decision of the given task there can be a rent of the additional equipment, launch of new equipment, introduction of additional shifts and so on.

Based on the introduced enterprise strategy designation will be presented as follows:

$$S_v = \left\langle T, \ \left\{FS_v^k\right\}, \ \left\{P_{vi}^k\right\}, \ \{W_{vi\mu}^k\}\right\rangle, \tag{1}$$

where $\in K_v$, $\in I_v^k$, $\mu \in M_{vi}^k$.

The most common way to analyze enterprise development strategies in international practice is to use a matrix SWOT analysis (Strength, Weakness, Opportunities, Threats) for some milk processing factory is shown in the Table 1.

Table 1. A simplified example of SWOT analysis matrix and for some dairy

STRENGTH	WEAKNESS
Known, product in demand in the local market; Availability of modern equipment for the production of ice cream and refrigeration.	High energy intensity of production own; Absence of transport for delivery of raw materials and finished products; Tired technical base for manufacture of whole milk products.
OPPORTINUTE	THREATS
Release of new products for the local market; Ingredients for the production of dairy products for export; Product realization in new regions.	Rising prices; Access to the local market with a lower cost of production; Loss suppliers of raw materials due to lack of transport.

Corresponding to the selection of the matrix (Strength, Weakness, Opportunities, and Threats), in the reviewing the following sets and criteria's for expert evaluation of the strategy:

(1) Set of criteria $X_S = \{X_S^r, r \in R_S\}$. Characterizing the degree of used of the strategy strength of the enterprise;

(2) Set of criteria's $X_o = \{X_o^r, r \in R_o\}$, characterizing the degree of use of enterprise strategy;

(3) Set of criteria's $X_w = \{X_w^r, r \in R_w\}$, characterizing the degree of elimination of the strategy the weak sites of the enterprise.

(4) Set of criteria $X_t = \{X_t^r, r \in R_t\}$, characterizing the degree of elimination of the threat strategy to the enterprise.

For the example of the SWOT analysis matrix the criteria X_S^1 the expert will answer the question (whether the products produced according to the strategy are consumed in the local market) but a criteria X_S^2 – whether modern equipment is used for the production of ice cream and refrigeration in this strategy? according to example $R_S = \{1, \ 2\}$. We will assume that the evaluation of the strategy according to the criteria reflects the degree of implementation of the relevant t question and all the views of the expert and the values in the range $[0,1]$.

We introduce to examination of some generalized criteria $\Phi(S_v)$ evaluation strategy is the decision maker which is built on the basis of partial criteria and any must satisfy the following conditions for any $v, \ I \in N$.

(1) If for two strategies S_v and S_I equivalent from the point of view of the decision maker, that should be done $\Phi(S_v) = \Phi(S_i)$.

(2) If for two strategies S_v and S_I in an implementation the strategic objective T from point of view of decision maker will be achieved better than when implementing S_i, then for the corresponding values of the criteria must be fulfilled $\Phi(S_v) > \Phi(S_i)$.

(3) If for two strategies S_v and S_I, strategy S_v (large in the world) reduces threats to the enterprise and it eliminates its weakness than S_i then for the corresponding values of the criteria must be met $\Phi(S_v) > \Phi(S_i)$.

(4) If for two strategies S_v and S_I, strategy S_v (large in the world), strengthens the use of the capabilities of the enterprise and its strengths that strategy S_i, that for the corresponding values of the criteria must be met $\Phi(S_v) > \Phi(S_i)$.

(5) Criteria $\Phi(S_v)$ should be allowed to get an evaluation of the strategy S_v.

Based on the available quantitative and the qualitative characteristics of the reflecting and its role in using the strongest sides and enterprise capabilities, as well as in the elimination of its weakness and threats.

(1) Criteria $\Phi(S_v)$ should be allowed to consider relative importance of those or other functional strategies, and also their task for achieving the strategic goal T.

Taking into account the translated requirements for the criterion $\Phi(S_v)$ we will consider rational the choice of strategies S_v , the solution of the problem

$$\max_{v \in N} \Phi(S_v), \qquad (2)$$

where S_v defined by (1).

The problem (2) will be called the model of rational choice of strategies. It corresponds to the situation, when all possible alternative strategies $S_v, v \in N$ are given, and it only necessary to evaluate them and selection based on criteria $\Phi(S_v)$.

4. THE RESULT

Taking into account the fact that the decision maker will allows try to choose the strategy of the enterprise development, with which provided the maximum of the strengths, opportunities, and maximum elimination of weaknesses and threat can be argued that the decision maker will aspire minimize the criteria $\overline{X_S}(S_v)$, $\overline{X_o}(S_v)$, $\overline{X_w}(S_v)$, and $\overline{X_t}(S_v)$, on the set of strategy $S = \{S_v, v \in N\}$, then the criteria $\Phi(s_V)$ can be written as follows:

$$\Phi(S_v) = (\overline{PX_S}(S_v) + \overline{P_w X_w}(S_v) + \overline{P_o X_o}(S_v) + \overline{P_t X_t}(S_v)), \qquad (3)$$

where $\overline{P_S}$, $\overline{P_w}$, $\overline{P_o}$, $\overline{P_t}$ – non negative coefficient, reflecting the relative importance of the relevant set of criterion from the view of decision maker and having property $\overline{P_S}$, $+ \overline{P_w} + \overline{P_o} + \overline{P_t}$ $=1$.

5. CONCLUSION

The strategy of enterprise is the aggregated preplan document, establishing insufficient long periods of time the strategic objective of the enterprise. This paper discusses the issues of development model of strategic management of food industry development based on [1]. The results of the work are shown in the model (1).

REFERENCES

[1] Agrafonov V.A., *Analysis of Strategies And Development of Integrated Programs*, 2000.
[2] Safwan A.S., Jabber H., Weights adjustment neural networks,*European Journal of Scientific Research (EJSR)*, Vol.21, No.2, 2008, pp.314-318.
[3] Safwan A.S., Batiha Kh., Business process simulation with algebra event regular expression, *Information Technology Journal*, Vol.5, No.3, 2006, pp.583-589.