

Decision Support Systems for Small Enterprise Based on Knowledge Management

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Abstract

In this paper, based on an analysis of small enterprises' features, the sustainable development strategy and tactics of the small enterprises are discussed. These strategies are that focusing on one target strategy, finding the vacancy strategy, management characteristic strategy, competition strategy, united contract management strategy and transferring strategy. The achievement of enterprise knowledge management is used and the decision support system principle is combined, a conceptual frame in which an enterprise strategy decision-making support system is established.

Keywords: knowledge management, strategy management, decision support systems

1. Introduction

Gorry and Scott Morton [1] firstly published the Decision Support System (DSS) theory in 1970s. People say that it is a computerized system that has assistant decision-making function. Moreover, DSS is mainly employed in supporting a single-decider management decision activity. In 2001 Courtney [2] discussed the DSS decision theory from the organization knowledge management point and presented a new decision pattern. According to the Simon principle of decision-making, a strategic decision is highly unstructured decision. It depends on the knowledge and the experience of the decision maker^[3]. In this paper, a conceptual frame in which a small enterprise strategy decision-making support system is presented which using the achievement of enterprise knowledge management and combining the decision support system principle.

2. Various Development Strategies for Small Enterprises

To let small enterprises run regularly and achieve the sustainable development, it is necessary to adjust and to control their economic activities. "To adjust" is to

adjust the quantity and the management level so that they can hit the formulated development target. "To control" is to check and monitor the management procedure according to the formulated plan and target during the economic activity of the small enterprises. In the present knowledge economic times and electric commerce, the development strategies of which small enterprises can choose are as follows^[4-5]:

(1) Focus on one target strategy:

Because of the features that the small enterprises have small scales, limited resources, etc, they usually can't manage various products to scatter the risks. But they can concentrate their limited resources and actual strength on the specialization management by choosing the detailed markets that can let the enterprises show their advantages.

Having taken this strategy, the small enterprises can stand stable in the market by means of enlarging the production bulk, raising specialization degree, product quality and increasing the scale efficiency. On the other hand, along with that demands become more and more varied and the specialization degree becomes higher and higher, the large enterprises will also welcome these small enterprises with a high specialization degree and good product quality to provide necessary accessory products for them. So the small enterprises can go on the sustainable development road by means of using smallness to mend largeness, using special it to mend vacancy and using perfection to win the market.

(2) Find the vacancy strategy:

According to the flexible and adaptable features of the small enterprises, they can find the various vacancies in the market and suddenly occupy the vacant market to win the success with the help of their own fast and flexible advantages. As soon as they have occupied the market, they can give free rein to their flexibility, and can go ahead or turn back freely. They can develop towards the specialization direction to extend the vacancy if they go ahead. They can also withdraw

from there to find new vacancy if other enterprises follow their steps.

Generally the products chosen by these small enterprises usually have following characteristics .a) A short life cycle, it can only be produced in a special period of time; b) a simple processing technique, a short production period and a little capital needed; c) to be ignored by the main competition; d) the small enterprises themselves are able to supply enough products to the vacant market.

This strategy is generally suitable for those weak and small enterprises or those newly founded enterprises. After the small enterprises grow to specific scale and become stronger, it can be considered to change their development strategy so as to prolong their management advantages and even to find out the sustainable development road.

(3) Management characteristic strategy:

Because it is easy for small enterprises to approach the customers, they can attract the customers with special characteristic products. It will be very competitive as soon as the management characteristic is formed. It can get the customers' trust, meet the customer's demand, and so as to establish an advantageous position in a long time. Especially when these management characteristics are not directly related with the size of the enterprises, the small enterprises can compete against some large enterprises in the market.

(4) United competition strategy:

Because the small enterprises have limited capitals, low production and technical level, it is hard for them to take the advantage of the scale efficiency. It can be considered that several small enterprises can be united together based on the equality and mutual benefit. Then they can help each other and develop the market together. It will be very helpful for their survival and development.

Basically, there are two kinds of united ways for the above-mentioned strategy. a) Loose union, i.e.: there is only relationship on production cooperation and specialty division between enterprises, no capital, technology and personnel exchange. b) Closed union, i.e.: besides the relationship on production cooperation and division, there are also capital and sales cooperation, for example: holding each other, sharing bonus according to the holdings, adjusting the surplus and deficiency each other and establishing the unified sales team, etc. The united small enterprises can form a survival union so that they can become more

competitive to achieve the sustainable development objective.

(5) Contract management strategy:

Based on the weak power and unitary product, when the small enterprises make the decision about their production direction, they can rely on the production system of the big enterprises. Instead of developing new products, they can take up the long-term and fixed orders from one or several big enterprises, and be one of the processing contractors of these big enterprises.

3. Transferring Strategy of Small Enterprises under Electric Commerce

Because electric commerce has a great effect on small enterprises, the first thing they have to do is to find a new and adapt strategy orientation in network value coordinate, and at the same time, making the decision about their production direction and transferring strategy based on their own characteristics and outside environment. They still prepare on the management for operation transferring.

(1) Network value coordinate

There are two dimensionalities in network value coordination: market range and enterprises production. The coordination of market range includes individual customer, small organization, customer and interest community. The enterprises production includes both carrier and content. The enterprises can make the orientation between carrier and content.

In electric commerce, the customers gain more and more dominant and it makes the keystone of the supply chain transfers to the customers. So, a direction appears on profit distribution: the profit of the carrier providers is becoming much less and the content providers gain more dominant.

(2) Choice of transferring value

The small enterprises need to analyze and estimate the position of present business in the value coordination in order to find the better value orientation. Actually, the division of industry in this environment is not clearly as past, it becomes a new instrument of competition advantage that the carrier providers combine with the content providers. In the value transferring process, according to two dimensionalities both the important of business and the innovation of practice. The choice strategies, which small enterprises can choose, are as follows:(a) New base, (b) Logos practice, (c) Innovation strategy, (d) Fineness running.

4. Knowledge Management-Based Decision-Making Process Model

The main decision-making process is composed of the followings: (1) Analyzing external environment and internal strength. (2) Business thinking and target analyzing. (3) Designing selecting business channels and ways. (4) Formulating business strategy.

However, decision-making knowledge and decision-making experience usually are explicit knowledge [6]. In the human mind, they don't clearly exist, and very difficult to apply. Thus, the results of decision-making are very dependent on the individual decision maker. Just when the decision maker leaves the enterprise or the moment the knowledge and the experience are not effectively used, then the effect of the decision-making may devaluate badly. Undoubtedly in strategic decision-making, knowledge management is very important, and sometimes has a decisive role. The emergence of knowledge management in an enterprise, has supplied an excellent turning point, to improve the standard of strategic decision-making and its effect.

Knowledge management is a systemization, a process that drives management and uses group knowledge, and includes knowledge foundation, knowledge issuance and sharing together [7]. Generally, knowledge management system is composed of knowledge gaining and generating system and knowledge issuance & sharing system. Knowledge gaining and generating system mainly uses the knowledge gaining relevant knowledge and experiences or supplies with a definite knowledge environment to create relevant knowledge, moreover document it and save it for the later use. Knowledge issuance system mainly uses computer network technology and data storage technology management and issues relevant knowledge. Knowledge sharing system mainly uses group apparatus and workflow system to reach knowledge sharing.

Traditional decision support system mainly uses models or data-supported decision making, and added knowledge storage and reasoning system on the existing decision making support systems, but due to knowledge gaining problems and knowledge management technology's immaturity, often the effect is not distinguished. However, the importance of knowledge and experience, for decision making, especially for strategic decision-making is self-evident. Thus, one should use all the enterprises knowledge and experience and other assist strategic decision-

making, and obtain the decision-making effects in Fig.1.

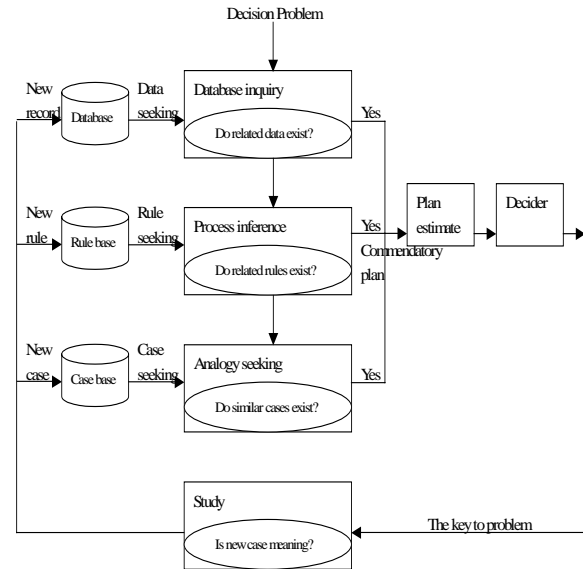


Fig1. Knowledge Management-Based Decision-Making Process Model

5. Basic Character and Logic Structure of Decision Support Systems

According to the strategic policy hierarchical structure, we can propose the DSS scheme under the environment of internet, it regards data warehouse as its center, uses the means such as on-line analysis and disposal, data mining. The logic structure is as Fig.2 shows.

The system can be classified as followings: basic systematic network, the data gathering, the data warehouse, Multidimensional data bases, the association and application of knowledge base and model base system, etc.

The main data of the system stems from the DB and knowledge base. The data warehouse management system will finish various kinds of tasks, for example, setting-up of the data warehouse and synthesis or drawing of the data in the data warehouse. The data warehouse management system is also responsible for the whole system's operation. Data mining, on-line analysis and disposal, is used for finishing various kinds of inquiry, data analysis, data exploitation and so on. The man-machine interface offers a connection between decision-maker and system by natural language processing and semantic inquiry.

The DSS system structure of strategic management which combining the data warehouse and corresponding data analysis tool stores and organizes the data with the data warehouse, and offers the overall data view for users' data visiting. DSS also can structure multidimensional data models which face the on-line analysis and disposal, analyze and compare with the multidimensional analytical methods, turn the activity-drive analyzing method into the data-drive one, realize the analytical method separated form data structure. And it can realize the automatic discovery of knowledge with the data mining technology; Offer the overall knowledge for making policy. The relation of the three has inherent unity is inherently unified. The data warehouse offers the data foundation for data analysis and data mining. The knowledge that is found in the data mining can be used for instructing the data analysis and disposal. And the new knowledge received in data analysis also can immediately supplement in the system. The analysis demand of policy-making system is constantly changeable, and it is difficult to predict in advance. The DSS of strategic management can really become the flexible and practical system with the new-type structure.

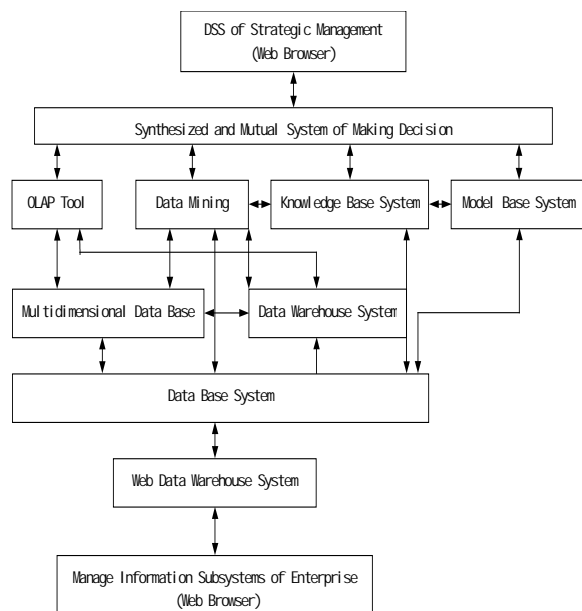


Fig. 2 The Logic Structure of Strategic Management

6. Conclusion

By the above discuss, the development strategies of which small enterprises can be choose, their transferring strategy can based on their own characteristics and outside environment. The decision-making process model based knowledge management is set up, it can use all the enterprises knowledge and

experience and other assist strategic decision-making. Then, the logic structure of DSS is show. These are important for small enterprises.

With the development in economic globalization and economic growth, the competition enterprises are facing is becoming more and more intense in business environment. For a better survival and improvement, an increasing number of enterprises are investing their energy in business strategy. An enterprise business strategy is the expression of the total enterprise's business thinking, it is a result of a series of strategic decision making, at the same time, it is also the basis for formulating the programs and plans. Thus, to formulate an outstanding business strategy, an enterprise must have the ability to effectively draw the right series of decision-making strategy.

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