Risk Control Method of Enterprise Social Network Marketing Based on Big Data Fusion Technology

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Abstract. The popularization and application of social network provides a broad platform and space for enterprises to carry out marketing activities, but at the same time, the virtualization of marketing environment increases the difficulty of marketing activities. Based on this, the enterprise social network marketing risk control method based on big data fusion technology is discussed, the enterprise social network marketing risk identification method is optimized, the enterprise social network marketing risk control evaluation index and evaluation algorithm are constructed, and the enterprise social network marketing risk control process is simplified. Finally, it is confirmed by experiments, The enterprise social network marketing risk control method based on big data fusion technology has high practicability in the process of practical application and fully meets the research requirements.

Keywords: Big data fusion · Social networks · Enterprise marketing · Risk control

1 Introduction

Marketing risk refers to the various risks that enterprises bear in the marketing process due to the incompatibility between their marketing strategies and strategies and the market due to the complexity, variability and uncertainty of the enterprise environment and the limited cognitive ability of the enterprise to the environment, which may lead to the obstruction, failure or failure of marketing activities or failure to achieve the expected marketing objectives. Social network marketing risk has the following characteristics: diversified participants, means and strategies required for operation, which makes the sources of risk diversified. Social networks expand the market risks faced by enterprises.

W. Fu and L. Yun (Eds.): ADHIP 2022, LNICST 469, pp. 112–126, 2023.
https://doi.org/10.1007/978-3-031-28867-8_9

Because after enterprises connect to social networks, their business scope involves more problems [1].

The concept of data fusion originates from the needs of war and depends on military applications. However, with the development of data fusion, it has become an independent discipline, which is not obviously affected by a certain application. Instead, it puts forward its own common problem by means of generalization and specialization of concepts with the help of reasoning. Data fusion is a concept with a wide range of applications. It is difficult to give a unified definition. Data fusion is a research direction aiming at the specific problem of using multiple sensors in a system. Its definition can be summarized as: the information processing process of automatically analyzing and synthesizing the observation information of several sensors obtained according to time sequence under certain criteria by using computer technology, so as to complete the required decision-making and estimation tasks. According to this definition, multi-sensor system is the hardware basis of data fusion, multi-source information is the processing object of data fusion, and coordinated optimization and comprehensive processing are the core of data fusion. The movement of information flow, logistics and capital flow at each stage in time and space will be accompanied by risks of different nature. The functional structure of the information platform and the risks generated at each level of the marketing decision-making process bring different losses to the enterprise. The dependence on technology is stronger, and technology affects marketing to a considerable extent. It is often the innovation of new technology that will bring changes in marketing mode and business environment. Sixth, uncertainty. It needs both technical support and the participation of managers, which makes the risk faced by the enterprise's marketing activities very uncertain. Marketing risk early warning uses identification model to identify risk factors in the risk identification stage.

Reference [2] proposes a multi-layer template update mechanism to achieve effective monitoring in multimedia environments. In this strategy, the weighted template of the high confidence matching memory is used as the confidence memory, and the unweighted template of the low confidence matching memory is used as the cognitive memory. By alternately using confidence memory, matching memory and cognitive memory, it is ensured that the target will not be lost in the monitoring process. Reference [3] proposes a fuzzy detection strategy to pre judge the tracking results. If the pre judgment process determines that the tracking result in the current frame is not good enough, the stored target template is used for subsequent tracking to avoid template pollution. The test results on otb100 data set show that the proposed auxiliary detection strategy improves the tracking robustness in complex environments by ensuring the tracking speed.

On this basis, a risk control method of enterprise social network marketing based on big data fusion technology is proposed.Identify the characteristics of enterprise social network marketing risk, and carry out early warning management for the above three different dimensions of marketing risk sources. AHP divides the risk system into several main levels (three levels in this paper), and then uses expert meeting method or Delphi method to score the established risk index factors within the given scoring range. Compare the scores of each risk factor, establish the corresponding judgment matrix, determine the risk weight, and determine its importance. The two-dimensional analysis

method based on the identification of marketing risk factors can observe the marketing risks of enterprises that cannot be investigated alone from the stage characteristics or risk characteristics of the marketing process, and organically combine the stage characteristics and risk characteristics of marketing risks.

2 Enterprise Social Network Marketing Risk Control

2.1 Identification of Risk Characteristics of Enterprise Social Network Marketing

The economic impact is whether the products and services operated by enterprises meet the economic characteristics of social network consumers, and also involves the identification and control of enterprise social network marketing risk characteristics. The imperfection of e-commerce marketing law brings very uncertain impact risk to enterprise management. The mode of social network operation is closely related to the development trend of social culture [3]. While the development of science and technology is diversified, it is very important for enterprises to grasp and apply new technologies, which should be synchronized with the development of new technologies. A simple enterprise social network marketing risk feature identification model can be shown in Fig. 1.

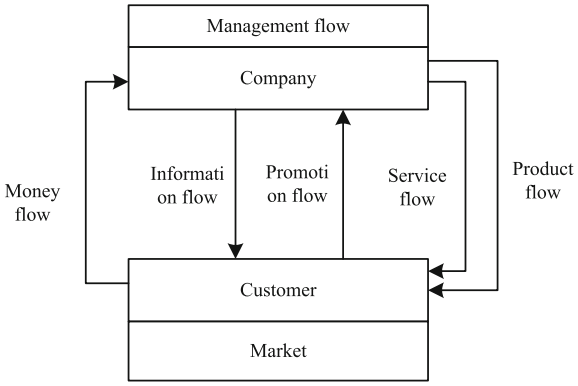

Fig. 1. Enterprise social network marketing risk characteristic identification model

As can be seen from Fig. 1, The first mock exam consists of two main elements: sales organization and market. Connecting these elements are three information communication processes and three entity exchange processes [4]. The company transmits information to the market through various marketing means. The response of customers in the market to the company's marketing activities is reflected in the sales performance of products and the return of payment for goods. Then the company collects these response information and makes plans for future behavior based on current and past information. Entity process refers to the movement that customers buy products or services and obtain benefits at the same time. The process of entity exchange has the characteristics

of all commodity transactions [5]. The process of information communication is the remarkable feature of modern marketing model. From the analysis of enterprise operation process, marketing risk is also accompanied by each process of operation process. The poor operation of any process in information flow, capital flow, business flow and logistics will affect the operation efficiency of the enterprise. See Fig. 2 for details.

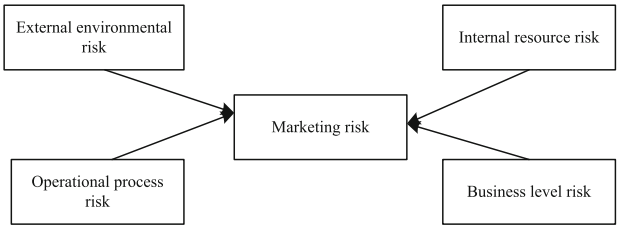

Fig. 2. Determination of enterprise social network marketing risk information identification

Enterprise social network marketing risk information identification refers to a management model that makes the enterprise management model have the ability of "alarm" and "immunity" in preventing, correcting or avoiding marketing errors and management fluctuations [6]. Early warning management carries out detection, identification, judgment, evaluation and pre control of management errors, management fluctuations and management adversity. The identification of enterprise social network marketing risk information takes the adversity phenomenon in enterprise business activities as the research object, so as to achieve the purpose of studying the essential characteristics, cause background and development law of adversity phenomenon and constructing enterprise early warning management mechanism [7]. Enterprise social network marketing risk information identification management is to monitor, identify, evaluate, warn and pre control the marketing risk based on the object of enterprise marketing risk. This paper will explain how to carry out early warning management according to the three different dimensions of the above marketing risk sources. Figure 3 shows the structure of marketing risk identification and early warning model.

As shown in the figure, it is an inclusive relationship from top to bottom. The highest level is the business level, including the following three risk levels: decision-making level, function level and operation level, and then detailed to the specific level. The operation level is generally the use of internal resources; The functional level usually manages the operation process; The decision-making level is a comprehensive evaluation of the statistical conclusions of the external environment and functional level, and then make decisions [8]. At the same time, there are risks at every level and stage. Therefore, to determine the marketing risk early warning in the social network environment. The advantage of this model is that once the risk occurs, it can quickly understand the source of the risk, and the enterprise can respond quickly. Due to different understanding angles of marketing risk, the performance of marketing risk is also different. From the perspective of the consequences caused by marketing risk, it can be divided into pure marketing risk and speculative marketing risk. Pure marketing risk refers to the uncertain state in which there are only loss opportunities but no profit opportunities. There are only

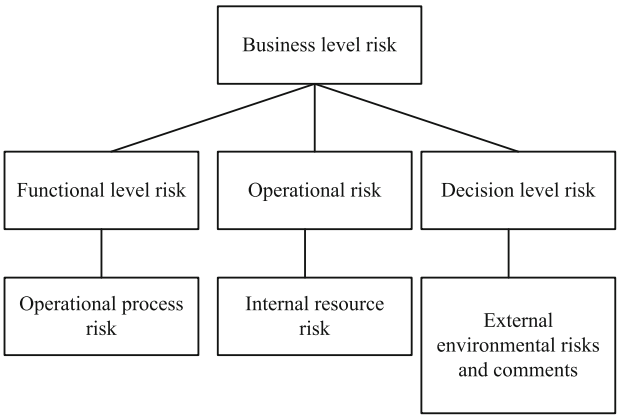

Fig. 3. System structure of marketing risk identification and early warning model

two consequences caused by pure marketing risk, either bring losses to the enterprise or no losses, and it has no possibility of profit [9]. Such as damage and deterioration of goods, bad loans, etc., are pure risks. Speculative marketing risk refers to those uncertain states with both loss possibility and profit possibility. It leads to three possibilities: no change in loss and profit. Speculative marketing risk mainly depends on people's risk handling skills to prevent. It is a complex, changeable and very difficult risk. It often puts enterprises in a dilemma. The handling of speculative marketing risk is not only a science, but also an art, but also the focus of marketing risk discussion (Fig. 4).

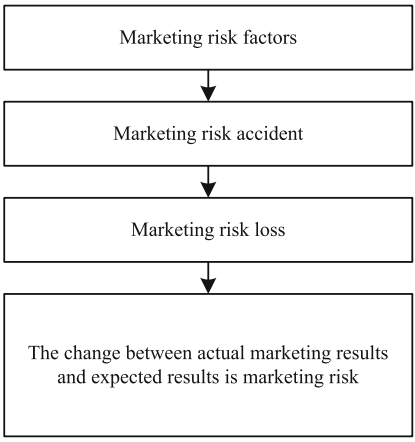

Fig. 4. Risk factors of enterprise social network marketing

Marketing activities are complex business activities. There are many uncertain factors in every link, from the formulation of market strategy to the establishment of marketing mix, from the issuance of products to the settlement of payment for goods. In a complex environment, due to the limitations of the experience and ability of marketing subjects,

they do not fully understand and grasp the generation, development and consequences of risks, or fail to take timely and effective measures to prevent them, which will lead to various losses. The most common is the mistakes of marketing managers themselves, that is, the risks and losses caused by their sense of responsibility and work quality [10]. The actual loss of the risk caused by this management failure will be much greater than expected. A new risk will be caused by a risk, and a big risk will be caused by a small risk.

2.2 Social Network Marketing Risk Control Evaluation Algorithm

Determine the weight of each expert. The weight of each expert can be obtained in this way. Given the score range, the larger the score, the better you know about the risk system. Give yourself a score within the score range [11, 12]. Let x represent the score given by the first expert, and then calculate the average score, expressed by X. Then the expert weight vector is y_{in}^{j}, in which the weight of the expert judge is $i = 1, 2, ..., n$ and the weight constitutes the weight vector $j = 1, 2, ..., n$. . The analytic hierarchy process divides the risk system into several main levels (mainly divided into three levels in this paper), and then uses the expert meeting or Delphi method to score the established risk index factors respectively in the given score range. The greater the score, the more important this kind of risk is, Then compare the scores of each risk factor and establish the corresponding judgment matrix to determine the risk weight, and then determine its importance. Matrix s represents the evaluation matrix of the i-th layer from the risk perspective of the expert.

$$s_{i\alpha}^{j} = \begin{bmatrix} \frac{y_{i1}^{j}}{y_{i1}^{j}} & \frac{y_{i2}^{j}}{y_{i1}^{j}} & \cdots & \frac{y_{in}^{j}}{y_{i1}^{j}} \\ \frac{y_{i1}^{j}}{y_{i2}^{j}} & \frac{y_{i2}^{j}}{y_{i2}^{j}} & & \frac{y_{in}^{j}}{y_{i2}^{j}} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{y_{i1}^{j}}{y_{in}^{j}} & \frac{y_{i2}^{j}}{y_{in}^{j}} & \cdots & \frac{y_{in}^{j}}{y_{in}^{j}} \end{bmatrix} \tag{1}$$

In the judgment matrix s (indicates the target number of criteria in the previous layer, and Y indicates the score given by the expert to the k-th risk factor of / layer. The weight value of each expert's index factor for each layer can be obtained by applying the principle of analytic hierarchy process. The size of the risk factor can be obtained from the vector]. Therefore, in the result of artificial subjective judgment, we can judge and prevent those risk factors from light and heavy, and then take relative measures to prevent them from happening. According to the above-mentioned operation For the specific characterization and cause analysis of marketing risk, according to the ideas, principles and methods of the above-mentioned early warning index design, after the preliminary selection of indicators and the improvement of the system, we established the enterprise internal marketing risk early warning index system, as shown in Table 1.

The so-called marketing reliability refers to the probability that the elements of marketing environment E_t, marketing model S_t and marketing management M_t interact

Table 1. Enterprise internal marketing risk early warning index system diagram

Internal cause marketing risk early warning evaluation index system	Primary index	Secondary index	Auxiliary indicators / data points
	Organizational strategic risk evaluation index	Feasibility of marketing strategy	Accuracy of business direction; The scientificity of formulating strategy; Rationality of marketing objectives
		Accuracy of marketing strategy	The number of marketing strategies used accurately; Total number of marketing strategies developed
	Organization risk evaluation index	Self organizing ability	Coordination and adaptability of the organization
		Tissue activity	Organizational learning and innovation ability
		Rationality of management level	Actual and required management levels
		Rationality of management range	Actual leadership and number of managers who should be able to manage
	Organization function risk evaluation index	Proportion of marketing function	Many functions of marketing activities; Realization degree of comprehensive marketing indicators

to achieve the predetermined marketing function in a specific period of time. Multiple forces are interrelated and interact with each other, which can be measured by formula.

$$K_t = s_{i\alpha}^{j} E_t \cdot S_t \cdot M_t \tag{2}$$

The opposite of reliability is unreliability, that is, marketing accidents. Unreliability = 1 - Marketing reliability. Marketing accident (Marketing unreliability) does not represent marketing risk, but it is closely related to marketing risk and is the proximate cause of marketing risk. High marketing accident rate means high possibility of marketing risk loss. We use the marketing risk coefficient to represent the degree of marketing risk, and the marketing risk degree is the product of marketing risk coefficient and marketing unreliability. Marketing risk management is to improve marketing reliability and reduce marketing risk. It can be seen from the above formula that there are many factors affecting the market share, one of which is the price factor, and the price of products depends

on the price of raw materials, equipment efficiency, wages and management level. The other is non price factor, which depends on technology development ability, market development ability, enterprise reputation and customers' preference for its products. The overall effect of these factors is different from that of time. The following table lists the threats of the decline of enterprise market share. In fact, the complete marketing threat analysis should uniformly list and analyze the possible marketing accidents, as shown in Table 2.

Table 2. Marketing threat analysis based on big data fusion

Threaten	Reason	Result	Risk mitigating factors	Loss estimation	
				economic loss	Market loss
Market share decreased by 10%	The price is on the high side	Lose some customers	cost reduction	550000 yuan	3%
	Backward technology development	Lose some customers	Increase technological innovation	250000 yuan	1%
	Weak market development	Can't attract new customers	Increase market investment	350000 yuan	2%
	Low enterprise popularity	Can't attract new customers	Enhance corporate image	250000 yuan	2%
	Customers do not form preferences	Lose some customers	Strengthen brand building	250000 yuan	1%
	Poor sales service	Lose some customers	Implement satisfactory service	150000 yuan	1%

It should be noted that in the macro environment, although political and legal environmental risks, macroeconomic risks and social and cultural risks all have an important impact on enterprise marketing activities, most enterprises can only adapt to these risks, and their changes are beyond the ability of enterprises. Moreover, their influence on enterprise marketing is very complex, so they are not included in the key object of this paper; The influence and significance of science and technology on enterprise marketing activities are significant and far-reaching, which is reflected in the reduction of supplier costs, the enhancement of competitors' technological innovation, the emergence and competition of alternative products and so on. Other influencing factors will be reflected in the follow-up study of the evaluation index system. Finally, a two-dimensional table as shown in Table 3 is established.

Table 3. Two dimensional analysis of marketing risk factors based on big data fusion

	Type	Internal marketing risk		Exogenous marketing risk			
Stage		Marketing organization operation risk	Marketing actor risk	Competitive risk	Customer risk	Supply risk	Third party risk
Value choice	Customer segmentation	K11	K12	K13	K14	K15	K16
	Market segmentation	K21	K22	K23	K24	K25	K26
	Value orientation	K31	K32	K33	K34	K35	K36
Value creation	product development	K41	K42	K43	K44	K45	K46
	Service development	K51	K52	K53	K54	K55	K56
	Product manufacturing	K61	K62	K63	K64	K65	K66
Value communication	distribution service	K71	K72	K73	K74	K75	K76
	Personnel promotion	K81	K82	K83	K84	K85	K86
	Sales promotion	K91	K92	K93	K94	K95	K96

Horizontal lines represent all stages of the marketing process, and vertical lines represent risks with certain characteristics. Where k represents the characteristic risk of the second stage of the marketing process. Based on the two-dimensional analysis method of marketing risk factor identification, we can observe the enterprise marketing risk that can not be investigated separately from the stage characteristics or risk characteristics of marketing process, and organically combine the stage characteristics and risk characteristics of marketing risk. This helps to clarify the relationship and characteristics between marketing risk factors and each stage of the marketing process. In the marketing process, with the advancement of the process, the change of the marketing environment and the increase of relevant participants, the uncertainty factors gradually increase, and the probability of risk also gradually increases. Due to the accumulation of investment, the possible loss caused by risk is increasing. As for each stage and its related risks, it will be discussed in detail in the construction of follow-up index system.

2.3 Vision of Social Network Marketing Risk Control

Enterprises must establish corresponding organizations to command and coordinate marketing risk control. Enterprise marketing risk control organization is the center of enterprise marketing risk control. In the process of daily production and operation activities, the enterprise marketing risk control organization is responsible for the knowledge training and education of marketing risk control, formulating corresponding rules and regulations, analyzing and evaluating possible marketing risks, putting forward response

plans, and organizing simulation exercises of marketing risk disposal; After the occurrence of marketing risk, the company will uniformly command and coordinate the forces of all aspects of the enterprise, and be fully responsible for the handling of marketing risk. Depending on the enterprise scale and business complexity, the establishment scale of enterprise marketing risk control organization is also different. For small enterprises, their marketing risk control organization sets up a marketing risk control group under the marketing manager and is equipped with several corresponding professionals to specialize in marketing risk control. Its organization is shown in Fig. 5 below.

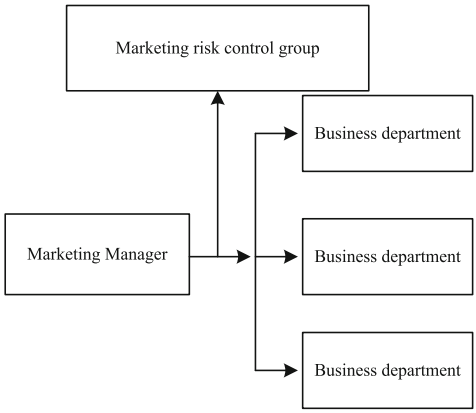

Fig. 5. Organizational structure of enterprise marketing risk based on big data integration

Generally speaking, the index system is a collection of a series of interrelated indicators that reflect the basic situation of a social and economic phenomenon. It reflects the quantitative performance and quantitative relationship of social and economic phenomena from multiple perspectives and levels. Similarly, to build the index system of enterprise marketing risk early warning model is to analyze all kinds of risks reflected in the index system according to the method of model analysis, and divide it into thousands of parts. Construct the framework of the index system from different aspects, and then subdivide each part and side until the evaluation can be described by statistical indicators. Marketing risk has different forms in different marketing environments, marketing stages and marketing subjects. From different angles and different reasons for the occurrence of risks, we can divide enterprise marketing risks into many types. Marked by the category of risk loss, marketing risk can be divided into natural risk, social risk, economic risk, political risk and technical risk; Marked by the controllable degree of risk, marketing risk can be divided into controllable risk and uncontrollable risk; With the level and scope of risk involved as the symbol, marketing risk can be divided into macro risk and micro risk, with the object of risk as the symbol, marketing risk can be divided into property risk, personal risk and responsibility risk, with the nature of risk as the symbol, marketing risk can be divided into dynamic risk and static risk, with the cause of risk as the symbol, marketing risk can be divided into subjective risk and objective risk, with the source of risk as the symbol, Marketing risk can be divided into internal risk and external risk. In short, the types of enterprise marketing risk are diverse,

and the formation of risk is the result of the joint action of many factors. When the effect reaches a certain degree, the occurrence of an event plays a leading role, resulting in the occurrence of marketing risk. According to the different causes of enterprise marketing risk, it is divided into internal cause risk and external cause risk, that is, marketing organization risk and external environment risk. The evaluation index system structure is shown in Fig. 6.

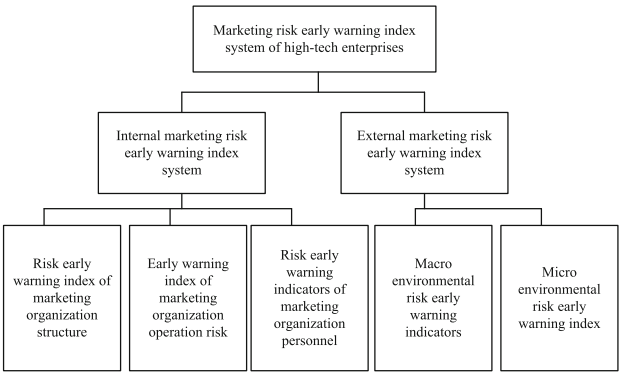

Fig. 6. Enterprise network marketing risk hazard index level

The marketing organization and human resource model in the enterprise network marketing risk hazard index model have many indicators that are related. They can be combined into a marketing organization model to retain more objective indicators as much as possible. The fund control model can achieve good control in financial risk early warning; The sub model of marketing strategy control model can be indirectly reflected by product control sub model and organization personnel control model. In order to eliminate the redundancy of indicators, they are also excluded from the control model. According to the above selection and selection of marketing control models, what remains are product control model, competition control model, public control model, collaborator control model and organization control model. Therefore, in this paper, the enterprise marketing control model is composed of these four sub models, as shown in Fig. 7.

Common big data fusion measurement methods include modeling method, variable control chart and set discrimination, but these methods determine the risk based on qualitative analysis or uniform value, propose to use the industry risk level as the central value, and then use the big data fusion analysis model to determine the risk grade method, which can flexibly determine the early warning grade according to the situation of the industry, the acceptance level and management ability of enterprise marketing risk. Based on this, the scale of marketing risk classification is determined, and the early warning level is determined according to the marketing risk level, as shown in Table 4.

Generally speaking, in the changing environment, the key to determining the position of enterprises in the market is the effectiveness and creativity of marketing organizations. Therefore, the internal marketing risk is mainly caused by the low efficiency of enterprise marketing organization. The purpose of analyzing the internal marketing risk factors

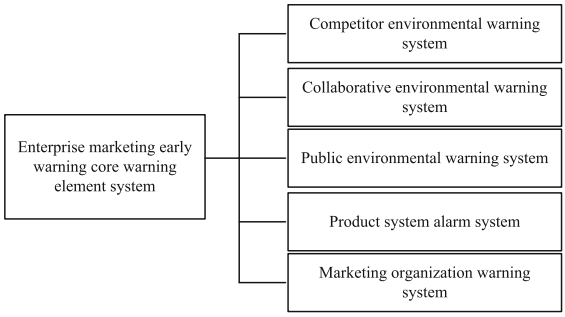

Fig. 7. Adjusted enterprise marketing risk level early warning model

Table 4. Marketing risk warning level

	Issue 13	Issue 14	Issue 15	Issue 16	Issue 17	Issue 18
BP marketing risk evaluation index	63	58	69	83	73	78
Risk alarm level	Central police	Central police	Central police	Light police	Light police	Light police
BP marketing risk evaluation index	19	18	10	48	39	48
Risk alarm level	Heavy police	Heavy police	Heavy police	Central police	Central police	Central police

of enterprises is to find and master the key factors affecting the marketing results of enterprises in the marketing organization, so as to create good conditions for the smooth implementation of early warning and pre control. For large enterprises, risk control is more complex. Its organizational structure is shown in Fig. 8 below.

The establishment of a special marketing risk management organization is conducive to the coordination and disposal of marketing risk management internally and externally, and provides an organizational guarantee for the effective prevention of marketing risks and the rapid and effective disposal of existing risks.

3 Analysis of Experimental Results

When measuring the effect of enterprise social network marketing risk control based on big data fusion technology, we rely on the normal distribution curve, which is the characteristic of variance covariance method and Monte Carlo simulation method. However, for the marketing risk of an industry or enterprise, the normal distribution curve may

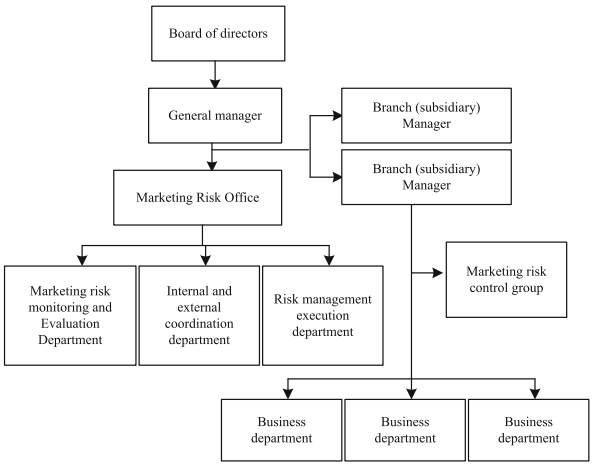

Fig. 8. Enterprise marketing risk management organization

not be the most appropriate model. Take the actual value of enterprise capital stock as a reasonable deflator, fully consider different systems, and add the deflator of capital marketing in income and product accounting, but the system does not take the adjustment of product quality into account. The system mainly includes the regression quality adjustment of characteristic information and the estimation of "near" vector autoregressive function:

$$R_t^q = \kappa_0 + \kappa_1 R_{t-1}^q + \kappa_2 R_{t-1}^n \tag{3}$$

In the formula: R_t^q is the risk factor obtained from the data set; R_t^n is the official enterprise capital marketing index; κ is the coefficient of each interaction item of the enterprise. To verify the practical value of the new enterprise social network marketing risk data behavior characteristic analysis method, the following comparative experiment is designed. Although the risk distribution does not completely obey the normal distribution, as shown in the figure below, the normal distribution can be used for simulation and prediction as a reference for risk management and marketing decision-making (Fig. 9).

In the above two curves, the normal distribution curve is symmetrical. It means that the opportunity for the return of the enterprise market to rise and fall is equal. The return of product sales in the industry is asymmetric. We know that Literature [2] method underestimate the possibility of huge losses because they rely too much on the normal distribution curve. In comparison, Monte Carlo simulation method overcomes this deficiency. Further, taking the once financing marketing behavior of an enterprise as the experimental object, record the changes of the negative impact of data behavior on the marketing revenue of enterprise social network before and after the application of this method in the experimental time of 5 months. The following figure reflects the change of the negative impact of horizontal data behavior on enterprise marketing revenue in the experimental time of 5 months (Fig. 10).

The analysis shows that with the increase of experimental time, the control effect of enterprise marketing risk under the guidance of this method is obviously better.

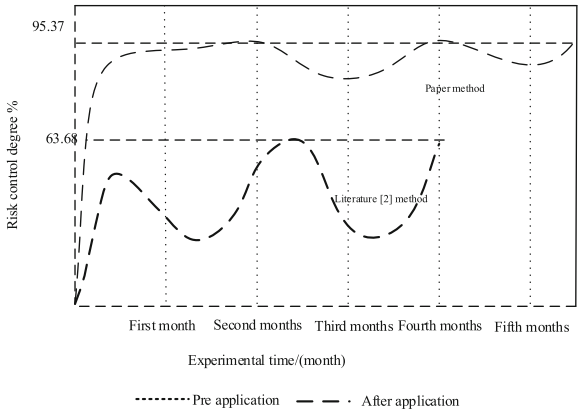

Fig. 9. Normal distribution of enterprise marketing price risk and market risk

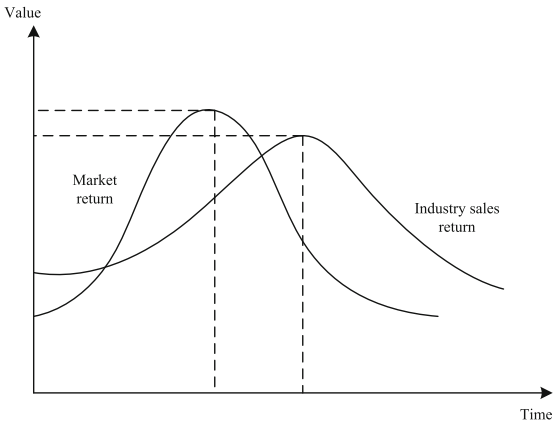

Fig. 10. Comparison of control degree of negative impact of enterprise marketing

4 Conclusion

By analyzing the source of marketing risk in the social network environment, a set of marketing early warning model with hierarchical and inclusive relationship is obtained, and the risk identification and control are carried out in combination with big data fusion technology to appropriately improve the early warning of marketing risk in the social network environment. This paper discusses the enterprise social network marketing risk control method based on big data fusion technology, optimizes the enterprise social network marketing risk identification method, constructs the enterprise social network marketing risk control evaluation index and evaluation algorithm, and simplifies the enterprise social network marketing risk control process.Put forward early warning countermeasures according to marketing risks, hoping to provide reference for operating enterprises in the social network environment.

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