

Research on the Enterprise Marketing Management for Internet Companies based on Data Mining and FTA

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Abstract: In this paper, in order to improve the efficiency and accuracy in marketing management, the enterprise marketing management for Internet companies based on data mining and Fault Tree Analysis (FTA) is studied. Every customer includes residents are potential customers of the virtual market, for customers who do not use real market, virtual market to provide the service, make the customer updates the knowledge and experience of the market service, when the customer not to walk in sales procedure, but in real life, you can attract the customer on the reality market to generate interest, and their evolution for the reality market customers. FTA provides a scientific method for the evaluation of network marketing system, the application shows that it is simple, reliable and practical, which makes it suitable for similar applications in other fields.

1. Introduction

In present information age, under the new media environment, business marketing has developed into a new height while changing with the ages. Enterprises is paying more attention to communication and feedback, even consider that business marketing and communication are inseparable aspects. This study is based on online application of new media, from marketing and economics perspectives, analyzes the new media environment of the network media. Exploring micro-blog and many other new media in depth in the marketing model of the correlation and difference, to fully examine the new media in the marketing modes of the important characteristics of new media development, demonstration, and on its modes of marketing analysis and forecasting, in favor of network new media in the commercial development of further development, the development of the traditional network the media has practical and referential value. Internet companies, as new media enterprises, to a certain extent, will become the model of business marketing innovation. Under the new media environment, how will Internet marketing transmit? In how many ways of marketing communications will the traditional enterprise marketing dissemination change? In the practical context, realistic characteristics and shortcomings and difficulties facing internet enterprise marketing dissemination are necessary for us to do further research on a theoretical basis. This paper, from the marketing and economics perspectives, analyze the new media environment of the network media. Taking micro-blog marketing under new media environment as typical case, introduce, analyze and summarize internet enterprises that are struggling in dilemmas, which should pay more attention to exploration of new marketing modes. Only by utilizing a marketing tool that suits those internet enterprises, combined with the traditional business marketing modes, can they integrate a massive strength so as to possess stronger competitiveness in the new media environment [1-3].

2. Overview

It has been about a hundred years when the marketing was born from a system ideal to a more mature theoretical framework. Accompanied by the changing of socio-economic environment and media environment, the system, concepts and principles of marketing theory are continually enrich ,innovation and development. The high-speed development of network technology and

digital multimedia technology has thoroughly changed the traditional media environment. Internet business enterprise as an emerging enterprise is also a new media form. In a sense it is a typical embodiment of that "marketing is communication and communication is marketing". This article focuses on the research of the marketing communication status of the Internet business in today's new media environment. And I focus on Internet business marketing communication's realities and plights to inquire into Internet enterprise marketing status and basic model. In light of the new media environment, I try to summarize the existing marketing communication models of the Internet enterprise. On this basis, we pointed out the shortcomings and the difficulties faced by them. And we also try to give some positive proposals on how to reform and to avoid.

The internet technology has fully entered the age of Web 2.0. Internet economy and enterprises are now playing more and more important roles in Chinese economic and social development. As a new-type productive form, internet has also brought many significant and farsighted innovation and complement to both the theories and practices of marketing. Based on the vast amount of related documents and data, this study undertook data mining and strategic research of the revolution and innovation happening in the past ten years of our local three big internet enterprises (i.e. Tencent QQ, Baidu, Alibaba), which aims to find out the general characteristics and successes of marketing in the age of internet. This study starts with some basic researches on the characteristics of internet economy and marketing and then it mainly focuses on systematic research of the marketing of the three big internet enterprises one by one. Thereby it acquires conclusion and summary of the innovation and inspiration of internet enterprises. In the process of page composition, through reference and by deep communications with relevant professional persons in this field, the development track and strategies of the three big enterprises are clearly seen. Itself-based, user-based and bold innovation can be concluded as the essence of the three big internet enterprises' marketing. The essence is also the reason of why they can become the leading internet enterprises in China only taking 10 years [4-5].

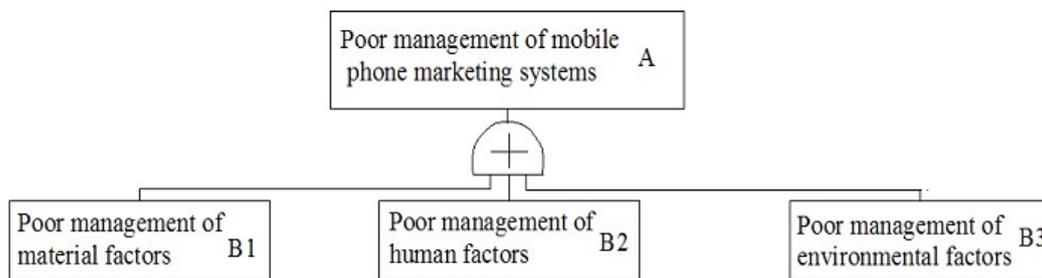


Figure 1. Fault tree of quality state of network marketing system

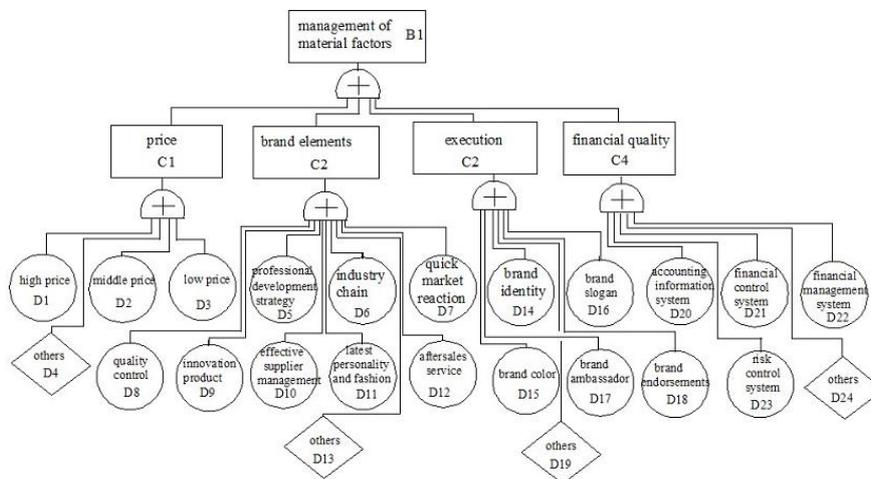


Figure 2. Fault tree of quality state of material factors

Internet is a big world full of unknown technologies. This study is groundbreaking in carefully

combing the innovation and practice of internet sales & marketing. It systematically concludes and summarizes the theories and practice methods of internet marketing. And it has also provided basic research materials for further studies and contrastive analysis of internet marketing. Of course our human history has never ever stopped its pace in way of creativity and innovation, so as internet. The future of internet is brilliant but difficult. Internet marketing will be a new study direction keeping developing. Its brilliant future needs joint efforts of more and more enterprises, research organizations, and practitioners [6-7]. Therefore, this paper takes the quality state of network marketing system in China, as a case to establish the fault tree of quality assessment, and the logical relations of fault trees are shown from Fig. 1 to Fig. 2.

3. Model and Algorithm

SNS Company is a main group of internet companies, and marketing strategy is the key part of business management theory which could be used to find proper marketing tactics. While the well-known traditional marketing strategy theories meet troubles when be used on SNS Company [8-9]. So that it is necessary to find out new marketing strategy theories which suit new business environment and could solve the problem in SNS market. The process can be expressed in (1) and formula is as follows [10-15]:

$$\hat{F} = \hat{W}^T \phi(u) \quad (1)$$

It's provided by the adaptive weight law. So estimation error of the weight is

$$\tilde{W} = W - \hat{W} \quad (2)$$

The positive values Wmax as follows:

$$\|W\| \leq W_{\max} \quad (3)$$

The adaptive weights law is defined as

$$\dot{\hat{W}} = -kG \|z_2\| \hat{W} - z_2^T G \phi(u) \quad (4)$$

$$\varphi_{ji}(\mu_j) = \exp\left(\frac{-(\mu_j - c_{ji})^2}{b_{ji}^2}\right), \text{ for } i = 1, 2, \dots, H \quad (5)$$

In this space, the mth multidimensional receptive-field function is defined as

$$\phi_m(\mu) = \prod_{j=1}^L \varphi_{ji}(\mu_j), \text{ for } m = 1, 2, \dots, N \quad (6)$$

The function can be written in a vector notation as

$$\phi(\mu, C, b) = [\phi_1, \phi_m, \dots, \phi_N]^T \quad (7)$$

The weight memory space with N components can be expressed in a vector as

$$W = [W_1, W_m, \dots, W_N]^T \quad (8)$$

The activated weights in weight memory space, which can be written in a vector form as

$$y = W^T \phi(\mu) \quad (9)$$

The state variables and the desired values can be defined as follows:

$$z_1 = x_1 - y_d \quad (10)$$

and

$$z_2 = x_2 - \alpha_1 \quad (11)$$

The following tracking error dynamics is shown as:

$$\dot{z}_1 = \dot{x}_1 - \dot{y}_d = x_2 - \dot{y}_d = z_2 + \alpha_1 - \dot{y}_d \quad (12)$$

From (2) and (6), it can be obtained:

$$\dot{z}_1 = \dot{x}_1 - \dot{\alpha}_1 = -M^{-1}Cx_2 - M^{-1}(G_g + d) + M^{-1}\tau - \dot{\alpha}_1 \quad (13)$$

τ is selected as

$$\tau = -\lambda_2 z_2 - z_1 - F \quad (14)$$

Then we can get:

$$V_2 = V_1 + \frac{1}{2} z_2^T M z_2 \quad (15)$$

With the enlargement of the scale of mobile, Internet users and the smart mobile devices in our country, mobility of our life and work becomes a trend of the times. The application for mobile Internet in enterprise marketing also gradually discovered by merchants and was used. So it is easy to speak that mobile devices and consumers accompanied "day and night". Either in the vehicle, on the road or in a restaurant, it is easy to find a string of "lower the head". In the network technology and terminal equipment are more and more improved. Between people and equipment, we can realize that sending and receiving data for any time. In addition, the mobility of mobile device determines the characteristics of mobile Internet marketing--any-time, anywhere.

Under the new background of consumers as the center of market, Brand-new marketing experience is clearly more suitable. Mobile Internet era has quietly around us. Therefore, it becomes particularly important that how enterprises to get good grades by using the appropriate marketing strategy. Research begins from the connotation and the characteristics of the mobile Internet, because of all the decisions are from that, different personality characteristics and marketing environment will have different policy enforcement, of course, completely different results. Based on all aspects compared with PC, mobile devices carried out some other characteristics of the mobile Internet. In addition, the theory study of consumer behavior, analyzing under the background of mobile Internet environment, the influence factors for consumer decision-making process which provides a theoretical basis to this article. According to Porter's five models, after analyzing the competitive environment of enterprise.

Consumers apply the mobile Internet are completely out of their own requirements of life or their value. The main part of enterprise marketing strategies is still for consumers. Buying behavior for consumers begins from attention for products and services. Then they weigh by Interest and searching, At last consumers implement their purchasing behavior according to the product and service. They share their feelings after purchasing depending on their subjective feelings. Using the theory of AISAS to study the process of buying, Companies can effectively market in any one link. There are no any standard strategies suitable for all companies based on the research of mobile Internet. Be clear for new marketing under the environment of new media which companies can be fit.

The characteristics of fragmentation, integrated, precise and personalized should be applied to the marketing strategy decision; The big data marketing, experience marketing, location and O2O marketing combined with characteristics--the media integrated marketing based on fragmentation, O2O marketing based on the location and the personalized marketing strategy based on precise orientation. Strategies and characteristics between supplement each other, mutual penetration. In the new era of marketing which the customers as the center, single marketing methods can't satisfy consumers, nowadays, Therefore, any strategy is not exist alone, they all play an important role in

marketing combination. Hope that through the analysis of consumer behavior, there is some help for enterprises under the background of mobile Internet. At the same time, due to the knowledge level and the limitation of objective conditions, research inevitably has some problems, which will continue to improve research in the future [16].

4. Results and Discussion

The construction of virtual market can promote the development of the real market.

To draw a fault tree, firstly fault that need to be analyzed is indicated as the top event, and then we've to orderly mark on the direct causes of such event to its below part, which is known as the fault event or the end event. Events between the top event and the end event are all called the middle events which are represented in the corresponding symbols, and then the appropriate logic gates (such as OR gate, AND gate, etc.) are selected to link the top event, the middle events and the end events to form a fault tree which will reflect the logical structure of relations of all levels of events or between the specific system fault (including material factors, environmental factors, human factors, etc.) and its subsystems. First, every customer includes residents are potential customers of the virtual market, for customers who do not use real market, virtual market to provide the service, make the customer updates the knowledge and experience of the market service, when the customer not to walk in sales procedure, but in real life, you can attract the customer on the reality market to generate interest, and their evolution for the reality market customers. Secondly, virtual market service is often direct face to face communication, customers of virtual market needs or suggestions will be more directly reflected, these suggestions and needs can also be used in the construction of Market in the reality, the embassy staff to the customer needs a deeper grasp, so as to promote the reality market customer service more fit the needs of customers [17-18].

With the continuous development of Web 2 technology, the market field has also begun to introduce to the customers, it is believed that 2.0=Lib Market + web 2.0, that is, the market 2.0. Compared with one-way web 1.0 for the dissemination of information, the features of Web 2.0 is interactive, namely between information customers and information providers and information between the customer feedback and communication more frequent, the change of Market 2.0 is not only in the technical level, the more is innovation of market service, service concept, namely more attention factors of market customers, providing more personalized services. In a certain sense, the market 2 should be more representative of the "open, participation, transparency," the development trend of the Web 2 information services. Tails "Market 2.0 four principles are good interpretation for the Market 2.0 which should have some basic ideas: (1) the ubiquitous market (the market is everywhere; (2) the market without the market has no barriers barrier; (3) the market invites participation and the market invites participation; (4) market (the market uses flexible, breed systems in the flexible single advantage system. Figure 3 shows the average borrowing capacity per capita of integrated marketing communication in network marketing management system based on fault tree and traditional in virtual market and figure 4 shows the visits to the sites on the Web for integrated marketing communication in network marketing management system based on fault tree and traditional in virtual market.

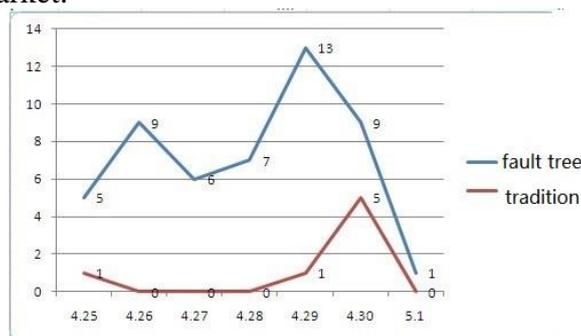


Figure 3. The average borrowing capacity per capita of integrated marketing communication in network marketing management system based on fault tree and traditional in virtual market



Figure 4. The visits to the sites on the Web for integrated marketing communication in network marketing management system based on fault tree and traditional in virtual market

The results show that the scoring system adopted by the end events can also be applied to evaluation scoring system of the network marketing system. The probabilities and statistics of basic events are evaluated and scored to obtain the final evaluation results of the top event. The characteristics of this model are as follows: (1) It is designed on the fault tree of the quality state of network marketing, so it can comprehensively reflect the operating effect of marketing system, and the network marketing system can be reasonably evaluated. (2) The impact of different levels of end events on the top event is considered, i.e. the influence of first end event level on top event is maximum, while the last end event level is minimum. (3) The score range of every end event can be applied in different scoring system. The evaluation results of the network marketing system can be shown as a single number. (4) This analysis and evaluation model can be completed with the help of computer so that the results can be easily and quickly obtained.

5. Conclusions

In order to improve the market ratio, the integrated marketing communication in network marketing management system based on data mining and fault tree analysis is proposed in this paper. Various impact factors in all levels must be comprehensively treated for the improvement of the reliability of marketing system. Meanwhile, the fault probability of each end event to the top event can be accumulated to establish a database so that the further analysis and evaluation of network marketing system can be carried out. Secondly, virtual market service is often direct face to face communication, customers of virtual market needs or suggestions will be more directly reflected, these suggestions and needs can also be used in the construction of Market in the reality, the embassy staff to the customer needs a deeper grasp, so as to promote the reality market customer service more fit the needs of customers. The experiment result shows that it is simple, reliable and practical, which makes it suitable for similar applications in other fields.

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