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## Research of Precise Marketing Strategy Based on Data Mining

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### Abstract

With the rapid growth of the amount of production and management data, precise marketing gradually replaced the traditional extensive marketing. And the rise of Databases and data mining technology provide the best solution for the precise marketing model. Data mining has been gradually into a variety of business applications. This

paper analyzes some basic concepts of data mining and precise marketing, By the Implementation and construction of Market segmentation system and cross-selling model, to achieve the purpose of precise marketing. Through the case of Mobile communications service, detailed analysis the Forecasting, modeling, model validation and the process of marketing strategies based on the marketing model.

Key words: DATABASE, DATA MINING, PRECISE MARKETING STRATEGY, MARKET SEGMENTATION, CROSS-SELLING.

## 1. Introduction

Today's enterprises is facing tough market environment, such as the increasing competition, scarce resources and diversification of consumer demand [1-3]. It requires enterprises to adopt a scientific and rational marketing strategy in production and business. There is no doubt that precise marketing strategy is very appropriate marketing model which get a great deal of attention by the business community and theorists in recent years. As one form of marketing, precise marketing are favored by many managers [4-6]. The issue of data mining to be studied and treated is find out the valuable event from huge databases, analysis and summarized into a structural model to help companies make scientific decisions.

### (1) Data mining

Data mining is analysis the observed data set to find out the unknown relationships and to summarize data by a novel way that the data owners can understand. This definition indicates that the main

purpose of data mining is to reveal hidden data, obvious data or data beyond expectations to help achieve the company's goals. By evaluating the data characteristics and rules, we can find meaningful relationships, patterns and trends. The data mining process in figure 1.

### (2) Precise marketing

Precise marketing is a marketing model which pursues the rational allocation of marketing resources [6], with precise operation characteristic and science-based management, to make the value of market services maximize. The main contents of precise marketing are: (1) scientific management; (2) Refinement operation; (3) allocate marketing resources scientifically; (4) customer-centric. The implementation of precise marketing makes the enterprise reborn; its strategic advantage embodied in the rational use of marketing resources and enhances the core competitiveness of enterprises. precise marketing model is shown in figure 2.

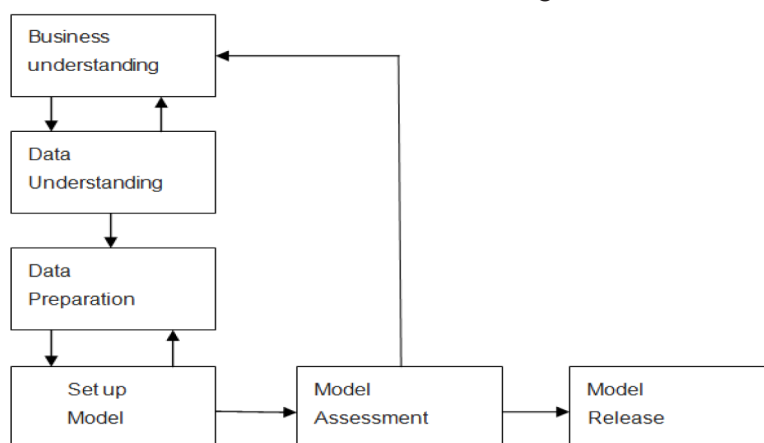


Figure 1. The data mining process

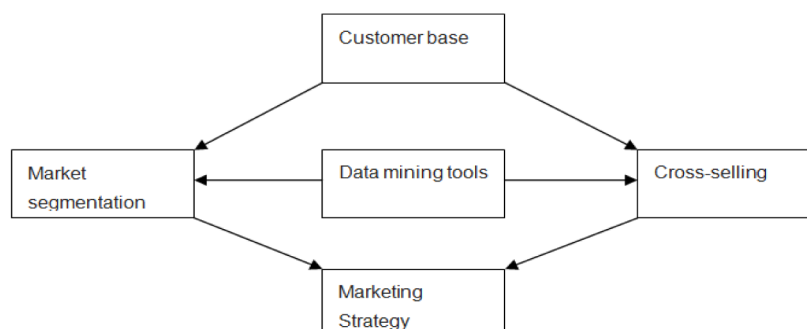


Figure 2. Precise marketing model

2. Data mining modeling analysis process

(1) Business goal

The X service is a new service products introduced by a mobile communication company. In view of the X service, Due to the purposeless SMS and outbound marketing way, Traditional marketing mode has many problems, such as poor injection effect, high marketing costs, easy to attract the customer resentment. To solve these problems, The business goal is to establish a customer prediction model and make marketing promotion to the customer with high probability prediction to improve the marketing effect. We can transform the business problem to the data mining problem, Through analyzing the character of business, decided to modeling by adopt the logistic regression model in the classification algorithm and the decision tree model, choose finally adopted model according to the model result. Figure 3 is the data mining modeling analysis process.

(2) Take data from the data warehouse

① Choose the sample data

Select 2013 as the time point for sample data, In order to ensure the data diversity, we can take sample 1 as conditional sampling and set the sampling conditions for “The users should took in the network for more than 3 months, registered X service for more than 1 months and used the service active for more than 1 months”, a random sample of 30000 records. Sample 2 for ordinary users, a random sample of 50000 records from the database system, and extracted 70% as the training set data, the remaining 30% as the test set data.

② Processing sample data

In order to ensure the model data is real and effective, we need to process sample data. Data cleaning process is: excluding special users, excluding extreme users, considering the user consumer behavior stability factor, after above process, generating wide table as modeling data.

③ Choose variable factor

According to the research of Arthur Hughes in the US Database Marketing Institute, There are three im-

portant indicators in the customer database, namely recency , frequency and monetary.

R-recency: recently purchased customers tend to buy again; F-frequency: Frequent purchased customers tend to respond; M-monetary: Bulk purchased customers tend to Consumption again.

According to the above analysis, we can build RFM variable index, natural attributes variable index and consumption characteristics attribute variable index and select numbers of variable factors for screening.

(3) Building customer precise marketing forecasting model

Using SPSS Clementine to construct a logistic regression model and CHAID decision tree model, the modeling process is shown in Figure 4.

Analysis modeling results, we can get a conclusion that logistic regression model is more stable and reliable, Select a logistic regression model to build customer precise marketing forecasting models based on this conclusion.

Dichotomous variables LOGISTIC regression model is one of the most simple LOGISTIC regression model forms, its variables are dichotomous variables (such as whether loss, whether to buy, etc.). Set the conditional probability:

$$P(Y = 1 | x) = p; x = (x_1, x_2, \dots, x_p) \tag{1}$$

as the relatively certain events probability based on observables, the logistic regression model can be expressed as:

$$P(Y = 1 | x) = \pi(x) = \frac{1}{1 + e^{-g(x)}}; \tag{2}$$

$$g(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n$$

The ratio of events occurs and not occurs probability (odds) is:

$$\frac{P(x = 1 | x)}{P(x = 0 | x)} = \frac{p}{1 - p} = e^{g(x)}; 0 < p < 1 \tag{3}$$

Odds logarithmic, obtain a linear function

$$\ln\left(\frac{\pi(x)}{1 - \pi(x)}\right) = \ln\left(\frac{p}{1 - p}\right) = g(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n \tag{4}$$

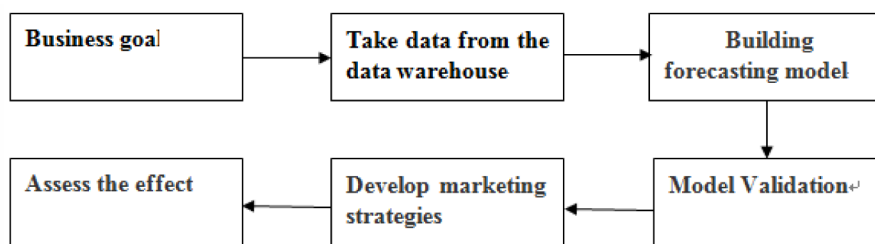


Figure 3. The data mining modeling analysis process

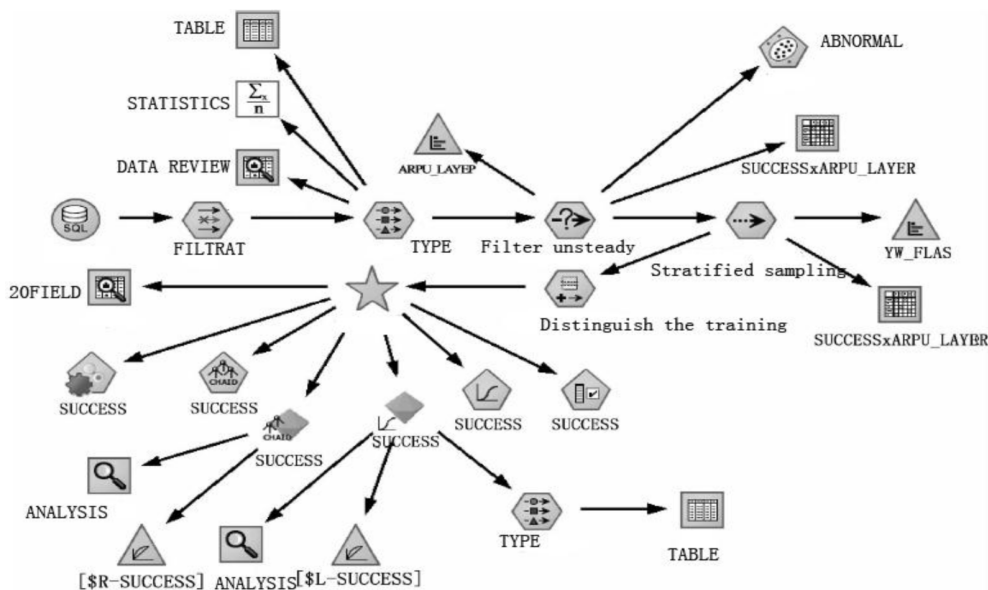


Figure 4. Modeling process of Logistic regression model

P is the probability of the corresponding variable Equal to 1,  $p / (1 + p)$ , also known as Odds, and the logarithmic ratio generating is response variable of regression model.

Model Validation

Use the remaining 30 percent of data set as test data to validate the model. The results are shown in

Table 1 and Figure 3. With the predicted probability increases, the marketing success rate and activity rates are increasing, showing a gradual upward trend and showing the model has strong stability.

3. Develop marketing strategies based on prediction model

For the high prediction probability user:

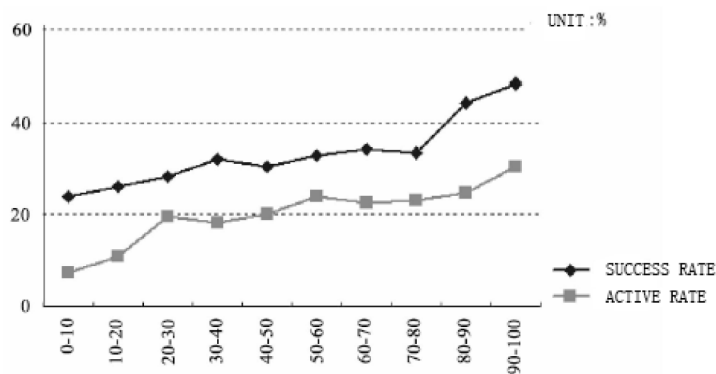


Figure 3. The success rate and active rate in different prediction probability intervals

Tab. 1. The success rate and active rate in different prediction probability intervals

X-service predicted probability /%	Survey amount	Success	Failure	Success rate/%	Number of active	Active rate /%
0-10	1120	279	796	24.9	20	7.1
10-20	1236	315	1030	25.5	33	10.5
20-30	1643	449	1298	27.3	82	18.2
30-40	1167	372	768	31.9	67	18.0
40-50	1430	426	1124	29.8	85	19.9
50-60	1245	422	807	33.9	97	22.9
60-70	1139	394	810	34.6	85	21.6
70-80	1329	443	669	33.4	104	23.5
80-90	1237	520	717	42.0	130	25.1
90-100	1439	684	1119	47.6	198	29.3
Total	12985	4302	8665	33.1	920	19.6

- (i) conduct outbound promotion.
- (ii) SMS blasts.
- (iii) Product Trial Promotion.
- (iv) bund the new service and the service users currently in use.

### Conclusion

This paper analyzes some basic concepts of data mining and precise marketing, Then put the precise marketing model, Deathly analysis the specific application of data mining in precise Marketing with the case of Mobile communications service. This paper argues that the precise marketing based on data mining is a very important tool to enhance the core competitiveness of enterprises [7-8]; it will play an important role in corporate marketing.

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## Research on the Big Data Model of E-Commerce in Cloud Networking Based on Consumer Behavior

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### Abstract

In this paper, the author researches on the big data model of E-Commerce in cloud networking based on consumer behavior. The emergence of the electronic commerce has its specific historical background, the economic weakness of the western developed countries and growth worry in developing countries is the internal demand of the electronic commerce. The paper aims to value all characteristics of e-business model, thus, E-commerce initiatives will be highlighted through inspirational case studies. Nevertheless, before conducting E-business model, we may consider an array of international economic, technological, social, and legal issues and then suggest solutions.

Keywords: BIG DATA MODEL, E-COMMERCE, CLOUD NETWORKING, CONSUMER BEHAVIOR