

Realization of the Sales Forecast of the Enterprise Based on VS.NET and MATLAB

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Abstract: A system based on a hybrid programming of VS.NET and MATLAB is studied to predict the sales of an enterprise. We make use of the previous and current data, choose different predicting models based on different produces to get the anticipated sale data. It provides decision support for an enterprise to organize production and operation.

Key words: Sales forecast for the company; Decision supporting; VS.NET; MATLAB

1 Introduction

In the modern enterprise, to enhance the enterprise information system of decision supporting function is a research direction currently, and the most important thing in decision supporting system is the analysis of sales forecast. A proper forecast of sales, can not only help judge the pattern of supply and demand of market, find out the competitive advantage for enterprise, and determine the type of product in development, but also can effectively forecast the occupancy rate of market, provide decision support for product development and product sales plans. But the application in actual sales forecast enterprise system is not ideal. After analysis, we found that reasons leading to this situation are as follows:

1) In order to improve the precision of prediction, sales forecast model usually contains a number of variables, functions and complex structures. A traditional programming language for such complex mathematical formula matrix is trivial and realizes up in low efficiency.

2) As the enterprise's internal and external environment changes, factors that affect sales budget are also changing, so it also requires the model of sales forecast system of model changed accordingly. But the design of prediction system is usually not flexible enough, so adjustment of larger models might cause the system to restart code. The situations above are the bottleneck that restricts the development of sales forecast system.

2 Input and Output Design

It is very important to make sales forecasts, but it is difficult to make high quality sales forecast. Before choosing an appropriate way to make forecasts, it is better to know the factors having effect on the sales forecast.

There are a few factors in the sales forecast to consider: basic requirement, requirement tendency, marketing activity, seasonal element, periodic element and irregular requirement. Basic requirement is the requirement forecast without taking account of the other factors. Seasonal element is taking account of some products' requirement variation, such as feather dress. It is popular in the north in the winter. So season must be an element to be considered. Requirement tendency usually takes account of the products' life circle: for example, products are in the initial period, and then requirement increases slowly, subsequently the proportion in the marketing is small. When the products are in the mature period, their requirements tend to be stable and gradual. Periodic element refers that the requirement of the product shows the periodic increase and the period various as the products. Sometimes the period is a month, and sometimes is a year. Therefore, when we make sales forecasts, we should make some adjusts according to the product. Marketing activities, such as advertisements and sales promotion, have much effect on the sales, so when we make sales forecasts, take account of the current marketing situation and power of the sales promotion. Irregular requirement refers to that requirement shows randomness, often because of exceptional situation and exceptional point. These factors are difficult to predict, so it lows the accuracy of the forecast. Of course, the situations referred to above don't cover all the factors that influence sales forecast.

According to the influential factors, we collect, analyze and clear up all the data and information. When we design the system, we can take the per capita income of the residents in a specific place, population age distribution, sales and price of a specific product in the last three years, season variation, the variation of the average income level in the future three years and the changes in the population as

the basic index to make forecasts. The content of the forecasts contains: the requirement of the market, sales and amount, produce price, life circle of a produce, expectant profit, market share, macroeconomic situation and new technology.

Sales forecast can be taken as a system, and it is a information switching process of information input, dispose and forecast output. For the complex forecast object, sometimes we should resolve it and make forecasts on the sub-system. According to this, we can make a forecast on the whole.

Sales forecast is a complex work, and to make the work run orderly, we must obey some rules.

The basic procedure of the sales forecast concludes:

2.1 Confirm the forecast goal

Sales forecast takes the sales of the products as the central, and the product sales itself is a complex system. The factors relevant are many, such as the potential requirement of the market, market share, price of the produce and so on. But whether to make a long forecast or a short term forecast requires different forecast files and methods. So, confirm the goal of the forecast is the main problem in the forecast.

2.2 Collect and analyze the files

After confirm the goal, to satisfy the need of the forecast, we must collect information relevant to the forecasts. The accuracy of the information has direct connections with the forecast results. So, we must analyze the information and satisfy these requirements.

(1) Pertinence of the information: the information must be consistent with the expectant goal.

(2) Accuracy of the information: the information must come from the reality and have been checked.

(3) Integrity of the information: the integrity of the information influences the running of the sales forecast. So we must take measures to make sure that the information is integrated.

(4) Comparability of the information: for the same information, it will be different because of different source and statistical. So when we collect information, we must analyze the information carefully, for example, reject the inaccuracy due to the randomness. For the information that cannot be compared, we should adjust it to avoid the errors in the forecasts because of the information.

3 Model Design

According to the different factors influencing the products differently, we can divide the forecast methods into ten categories: Delphi forecast method, moving average method, exponential smoothing, linear regression analysis, Jinwei function netting method, Markov method, demand price elasticity method, demand income elasticity method, seasonal index method, and boom forecast method. Different model forecasts different content. Delphi forecast method is mainly used to predict market requirement, expectant profit, macro-economic situation, and new technology; moving average method is mainly used to predict market requirement, sales and amount, expectant profit and market share; linear regression analysis is mainly used to predict market requirement, sales and amount, price, product’s life circle, and market share; Jinwei function netting method is mainly used to predict expectant profit and market share; the demand price elasticity method is mainly used to forecast sales and amount; seasonal index method is used to predict market requirement, sales and amount; demand income elasticity method is used to forecast mainly on market requirement; boom forecast method is used to forecast mainly on macro-economic situation. Taking account of the factors influencing the sales forecast varying according to the products, we take different sales forecast models to make the forecast more accurate.

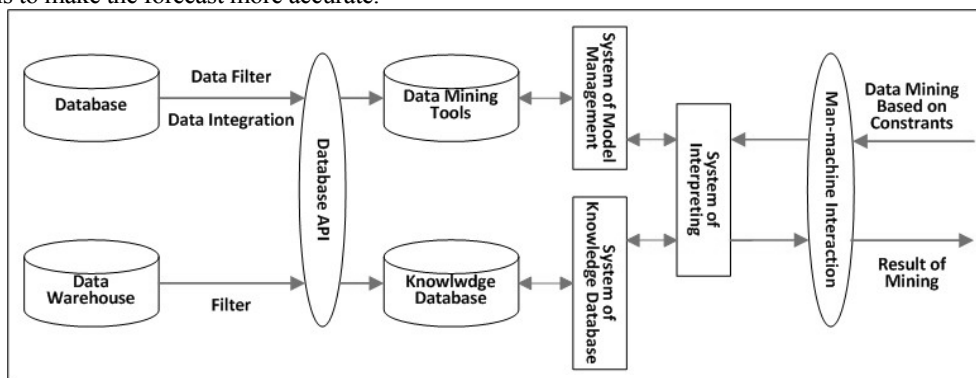


Figure1 The Data Mining Structure Framework Faced on the Sales Forecast

To conquer the defect of traditional prediction systems, we applied data mining techniques to sales forecast. The sales forecast supporting system that we designed based on data mining is composed of human-computer interactive systems, knowledge base, database (or data warehouse), data mining tools, model V management system, knowledge base management systems and analysis and interpretation system and so on. The structure diagram shows in Figure 1. Furthermore, the data mining tools access to the database or data warehouse by means of APT database, and accomplish all kinds of mining tasks in sales forecast.

4 Program Implementation

By analyzing the input and output design and model design, the final work of program implementation is a matter of course. Using MATLAB to build a prediction model library, and then compile the M function file to generate a COM Component, and the next place is followed by the register and release of COM component. During the cases mentioned in the application of VS.NET, input predicted data on the VS.NET interface which is the basic indicators of the input and output design. The basic indicators of the prediction will select an appropriate model according to the type of the product. At last, MATLAB will calculate and display the final prediction result. Sales forecast system not only uses the visual interface advantage of VS.NET, but also the characteristics of precise calculate to make the result of implementing program to be closer to reality. Managers can choose the right variety of production and management strategy by comparing the predicted results to improve the competitiveness of a enterprise. Before carrying out the work of data mining, we should be well aware of the goals of data mining, evaluate methods to achieve the established objectives, and it will greatly reduce the difficulty and workload of mining task.

Select data. These data may be a data warehouse or a data mart, they might as well be the data of all online transaction processing systems.

Preprocess data. This process can improve the quality of sales data, and thus help to improve the accuracy of the subsequent mining process and performance. Sales of high-quality decision-making must rely on high-quality data to detect data anomalies. The detect of data anomalies, adjustment of data, and reduction of data to be analyzed will get high returns during the decision-making process.

Before the mining task, you need the specific details of each to determine which ideas need to be verified, what aspects require tools to get the assumption from the data.

Construct data mining models. Usually, we first select a random number as a seed to divide data into two parts: training set and testing set, used to construct and evaluate models. Using data mining tools to test the quality of data, we compare all the outputs of various tools to accurately construct a model.

Verify conclusions. Make sure the conclusion is correct and meets business requirements, and if the results are wrong, we go digging to find the reason, and do re-mining to the data and re-structure a model.

5 Conclusion

This sales forecasting system is comparative accurate to accomplish the function of using historical data and real data to do a variety of prediction methods. Combining the advantages of MATLAB and VS.NET, synthesize considering various kinds of factors that affect the sales forecast, the system generates all kinds of data that companies needed, and provide important support for business managers to make decisions.

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