



Application of Machine Learning Algorithm in Marketing Education

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Abstract. The scientific and technological revolution of mankind has overturned the cognition of hawkers who only knew how to set up stalls more than a decade ago. At this stage, the transformation from simple business relations to complex online transactions not only highlights the development of science and technology and the progress of the times, but also indirectly reflects the changes in marketing methods and tools. In the field of marketing at home and abroad, database marketing, as a cost-effective marketing method, has attracted more and more attention in recent years as a “novice” salesperson in the sales market. However, as a forecaster of unpredictable market or neutron electronics, database marketing is completed through a simple data analysis, which is used in specific practice. Therefore, this paper is based on the application of machine learning algorithm in the field of marketing.

Keywords: Machine learning algorithm · Marketing management

1 Introduction

In this article, we will understand the application of machine learning algorithm in marketing education. In this article, we will understand the application of machine learning algorithm in marketing education. Machine learning is a process that involves using algorithms to train data sets to perform tasks such as pattern recognition and prediction. Training data sets are usually provided by analysts or researchers who collect them through surveys or other means. Once the algorithm is trained on a large enough sample, it can be used to accurately predict the new data set without human intervention. This allows machine learning algorithms to deal with real-world problems.

Since the 1990s, database marketing, a unique marketing method to adapt to the modern information society, has been used by enterprises. However, at this stage, consumers have many access platforms and diverse fields. Although reaching a large number of goods, they also. At the same time, businesses locate target consumers to face the increasing business [1]. The establishment of database marketing strategy is shown in Fig. 1 below.

The business of many e-commerce platform stores has been diluted due to too many products of the same type. If you want to gain an advantage in the increasing market



Fig. 1. Establishment of database marketing strategy

competition, an important way is that e-commerce stores accurately identify intended buyers in a large consumer group, so as to improve the marketing efficiency of stores. Based on the idea of database marketing, the customer purchase prediction model is finally constructed, and the database marketing countermeasures are further put forward [2].

2 Related Work

2.1 Basic Procedures of Database Marketing

Database marketing can not only provide comprehensive quality control and management, but also develop a new marketing model based on information technology, which has reached a new level in the current practice and verification. With the improvement of database marketing, it is widely used in business services, order services, big data marketing, non-profit organizations and even industrial production finance. Database marketing can which requires reasonable macro control and thoughtful marketing plan. In order to quantitative, more accurate in classification and positioning, and it is an effective marketing plan. Should establish trust and “intimate relationship” with consumers [3]. This reveal the human-machine relationship, Establish an artificial core, evaluate the rights of consumers and sellers. As shown in Fig. 2, the basic procedures of database marketing can generally be summarized as follows:



Fig. 2. Basic operating procedures of database marketing

2.2 Overview of Machine Learning Algorithms

Machine learning is a method of self-learning and self-improvement and optimizing performance from a large amount of existing data. Machine learning classification algorithm is mainly divided into two processes: model establishment and classification. Firstly, the classification algorithm is selected, and a classification model is obtained by training the model parameters through the training data set, and then the trained model is used to label the unknown sample data to be tested. Machine learning mainly includes unsupervised classification and supervised classification.

Unsupervised classification is mainly used for clustering, that is, without knowing the classification of the training data set, automatically find rules from the data set to establish clusters. The mark each cluster to form a category.

$$y_j = \sum_1^n w_{ij} - \theta_j \quad (1)$$

$$h_{w,b} = f(W^T x) = f\left(\sum_{i=1}^3 w_i x_i + b\right) \quad (2)$$

Classification is to mark the cluster and category of the data by calculating the marked clusters. Some scholars have classified clustering algorithms, which are mainly divided into five clustering algorithms based on division, hierarchy, density, network and model. At clustering methods mainly include k-means algorithm, DBSCAN algorithm and so on. The typical k-means method is based on “birds of a feather flock together” “First, then calculate the similarity distance between the remaining samples and the K cluster centers and classify them as the nearest cluster center, and finally recalculate

the average value of all samples in the K cluster as the new cluster center. This process iterates repeatedly until the objective function converges or reaches a certain value Threshold, usually including Manhattan distance, Minkowski distance and Euclidean distance, among which Euclidean distance is the most commonly used distance.

Supervised classification mainly constructs a classification model through training data sets to classify unknown data into known categories [4]. Commonly used supervised classification algorithms mainly include, naive Bayes and ANN. Among them, SVM was proposed by Cortes & Vapnik in his book in 1995. It realizes the principle of SRM (structural risk minimization), has strong generalization ability, and introduces kernel mapping. Compared with traditional statistical methods, SVM not only overcomes the requirements for a large number of samples, but also overcomes the problems of dimension disaster and local minima. Therefore, it is used in processing such as text classification, face recognition It has good performance on complex problems such as biological information processing. The framework is shown in Fig. 3 below.

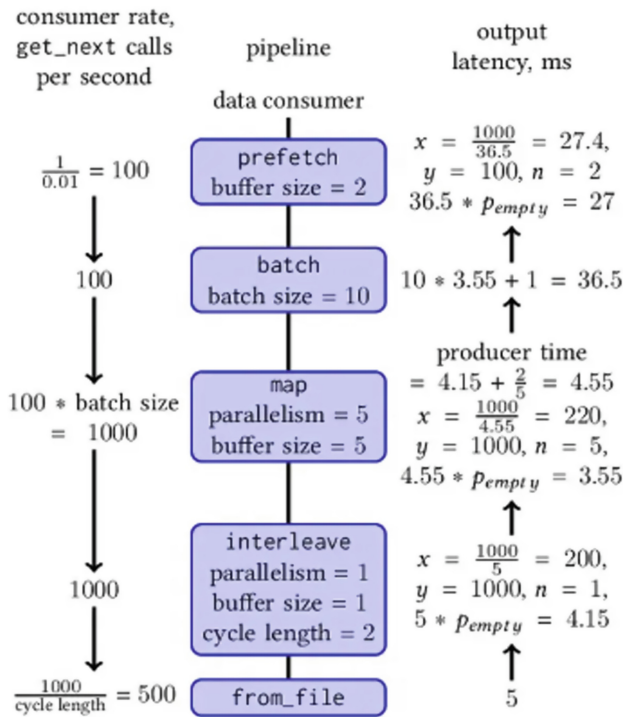


Fig. 3. Machine learning algorithm framework

3 Current Situation of Marketing Mode Composition

With Taobao gaining a firm foothold in the market and the gradual decline of the real economy, more and more businesses choose to enter Taobao, resulting in increasingly

fierce competition in online marketing. In the face of complex competitive environment, they continue to introduce newer and more comprehensive marketing methods, including link, cross category marketing, contact recruitment, similar groups Competitive products and cross platform marketing.

At present, crowd marketing is the most efficient. At first, this marketing method came from the marketing example of Wal Mart, a world-famous brand. They put diapers and beer together on the shelf, which greatly increased the sales of diapers and beer. The reason is that Wal Mart has made good use of big data technology and successfully found the potential connection between “diapers” and “beer”. Apply this idea and use historical data to calculate the relationship between various commodities in the store. On the one hand, bundle the most closely related commodities. On the other hand, there is no bundling sales, and sales are increased by pushing different materials closely linked. Since this marketing method is always aimed at regular customers, even though the marketing efficiency and precision are high, it now seems that it has certain limitations on the future development of the store. The mechanism of the cross category marketing method adopted is the same as that of the joint marketing. The difference is that the joint analysis of cross category marketing is based on the category, and the marketing object is new customers. However, due to the complexity of Taobao’s categories, the analysis cost is high and the marketing effect is the same [5]. As shown in Fig. 4 below, the current situation of marketing mode composition is shown.



Fig. 4. Current situation of marketing mode composition

The purchase conversion rate of contact recruitment marketing method is very low, and the marketing effect is the worst. The main reason for choosing operation for a long

time is that the object of marketing in this way is new customers, which can expand publicity to a certain extent and improve brand penetration, so as to lay a certain foundation for subsequent purchase transformation. Similar people are also called enlarged people, which is to extract the characteristics of the buying people and find people with the same characteristics. The magnification is too small and the number of crowd packages is small. In the delivery process, the impact of bidding mode will lead to obstacles in the delivery of crowd packages. If the magnification is too large, the similarity between the looking group and the buying group is low, which will dilute the marketing effect. The “predatory” marketing method of competitive products is only used as an auxiliary means because of its high cost and difficult predatory[6]. Cross the diversification and diversification, which provides enterprises with favorable marketing platforms. However, from the perspective of the current overall social media marketing and form, the cognition and practice of social media marketing are still in its infancy, and the marketing effects brought by short video media, live media, industry information media and tool media are not significant.

4 Database Marketing Idea Based on Machine Learning Algorithm

The beginning of the big data era has triggered a revolution in database marketing to a certain extent. In database marketing, significant changes have taken place in data display and statistical methods, but also as [7] functional database marketing according to the development. On the other hand, in the broader data context, the data format has the characteristics, diverse data models and so on. First of all, with the popularity of the Internet, the amount of information is growing rapidly. Second, visual and information can be transformed multimedia means. The idea of database marketing is shown in Fig. 5 below.

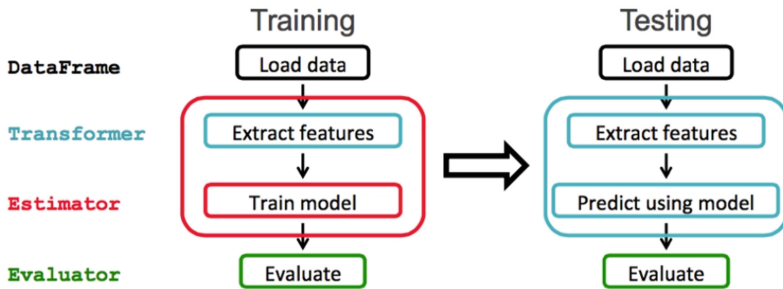


Fig. 5. Database marketing thought

Not all data is useful. Information overload makes it difficult to retrieve and store data. On the under the generalized data background is often a prediction algorithm. In traditional database marketing, several descriptive statistical methods described from different angles are used. The most common is sales channel analysis. After interacting with the flagship store “horse racing”, we bought it through other channels. After interacting with other channels, we will buy from the flagship store of the Jockey Club and

other channels. Therefore, according to the results of comparative analysis, whether to invest in the relevant costs of plundering resources from other sources can be decided. The relevant data is only the behavior, which is small and easy to access [8]. The flagship store “horse racing” generates a lot of data every day. If we continue to use this simple analysis and operation method, the beginning of “10000 vision” will be accompanied by the initial effects of big data, high cost and dilution. At present, technologies compatible with computer clusters are used in big data processing Machine learning with an effective cloud computing intelligent grid and prediction algorithm can quickly and knowledge from a large amount of data.

Due to the complexity of data format, the diversity of data structure and the limitations of data marketing methods, the integration of machine learning algorithm and database marketing came into being. First, machine learning algorithms must be applied to the field of database marketing. On the other hand, the data of marketing database has many forms. Traditional statistical methods only allow the analysis of digital data, and the difficulties of text, audio and video data processing restrict the development of database marketing. On the other hand, machine learning algorithm is the “only” method of data analysis. Through the targeted separation and organization of information, machine learning can study the potential information that users can use or obtain. These functions make database marketing easier, which can not only attract new consumers, establish long-term relationships with consumers, but also improve their value. Therefore, database marketing can more effectively cooperate with the trend of modern e-commerce era. The foundation of marketing needs the support of machine learning algorithm. Secondly, improving database marketing requires comprehensive machine training In fact, database marketing has only two purposes. In other words, hire new customers by changing contacts, cross platform flows, cross species predation, and analyzing competitive products. Frequent customer transactions are designed to maintain customer relationships, calculate repurchase cycles and repurchase rules [9]. Different methods are used for different purposes. However, with the emergence, can not fully adapt to the development of lynx stores. In order to e advantage in the market, marketing will combine big data with machine learning algorithms, update marketing methods and ideas, introduce customized marketing databases, increase costs, reduce costs, and improve sales efficiency.

5 Machine Learning is Five Reasons for Future Marketing

Leading stars are exploring online tools to improve business trends and performance. Of course, they can visit and monitor many websites and their content. Obviously, I found the advertisement of the same company on the Internet by time on the front of the book. What is more surprising is how Facebook integrates search practices and online activities to improve the integrity and standardization of advertising activities. Figure 6 below shows the complete foundation of database marketing.

Which provides opportunities for automatic learning and experience improvement in the system (uncertain programming). Machine learning focuses on developing computer programs to access, analyze, and learn data.

In addition to products such as Siri and Amazon [10]. This applies not only to Google, Facebook, Microsoft and other companies, who believe that our R & D budget is huge

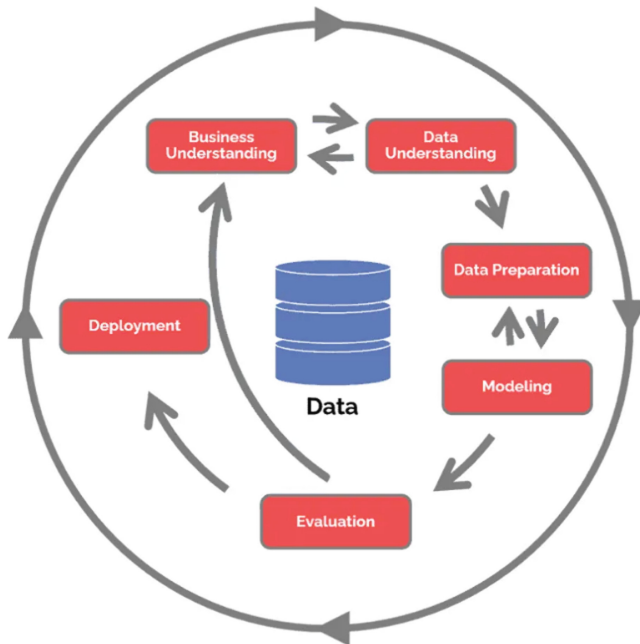


Fig. 6. Database marketing Integrity framework

on the whole. In fact, machine training can help most of the more than 500 enterprises operate more effectively and earn more money.

There are five reasons why enterprises need to implement machine learning and marketing strategies in scale.

A. It brings “real time” to life

For years, marketers have been bragging about the phrase “real time”, but it was not until machine learning appeared on the scene that it really became possible. No previous system is close to the response level provided by machine learning. Consumers view quotation changes by minute based on the almost unlimited data created by their behavior for machine processing. The repositioning of Facebook ads is just one example. The time of visiting the website is not long, so you can place advertisements on the agenda [11].

CEO adyton lafargenesis said, “machine learning and other modern technologies have opened up new possibilities for smarter marketing budgets.” In the future, the company will provide enterprises with machine learning solutions and other services. “With the help of these new technologies, enterprises can analyze a large amount of data in real time around the clock, deeply understand and manage big data, and obtain strong operational advice, which is the basis of current online business.”

B. Eliminate the biggest enemy of marketing

Effective marketing can attract audiences and bring changes. The problem is that marketing wastes this very simple problem. Due to the lack of more effective strategies, marketing activities have also begun. Whether on or outside the network, sports is essentially for sowing and germination.

You can imagine. Your marketing job mainly depends on who you want to see. People who browse your content or online advertisements say they are most interested in your products or services. Machine learning can reduce most marketing mistakes. By using behavioral data, marketers can effectively attract buyers and greatly improve their ability to turn buyers into customers.

C. Open the market forecast portal

For many years, experts have been studying market and demand forecasting. In many cases, the plan is based on a trend oriented procurement model. Using AI for marketing purposes can provide more specific content for decision makers. Before customers know what they need, they have a good way to deliver what they want [12]. These efforts will basically continue. But they will be informed by the data, rather than making blind suggestions to selfless consumers.

The famous developer kevincarroll said, “most of the work we have done in machine learning is carried out under the surface. Machine learning drives our algorithm to predict demand, rank product search, recommend products and transactions, arrange product promotion, detect fraud, translate and so on”

D. It helps build marketing content

Writers use insights handled by their companies or clients to create advertisements and e-mail marketing campaigns that talk to target audiences. However, adopt the catch-up method and a large number of educated guesses.

Machine learning narrows the range of supports. Then, it will be better: it provides a practical means of emotional analysis so that marketers know what to say and how listeners react [13]. The effect of emotional analysis has been exposed on twitter, and marketers can monitor social chat to understand the resonance with specific target audiences. Brand experts and writers can immediately adjust advertisements in response to comments and trend responses. This brings the right information to the surface.

E. It lowers costs

At present, the world is almost completely online, and machine learning can solve the biggest marketing problem. The charge is always close to the highest.

Machine learning reduces marketing costs. Because there are far fewer people who need help. Most customers can book articles, online advertisements and other materials through automatic e-mail and social media, and the price can be updated at any time, so the communication cost has also decreased significantly [14].

The accuracy of machine learning can also be used to produce and sell offline materials. Therefore, marketing can find the right amount and adopt the most effective method to reduce the excessive expenditure related to overproduction.

6 Conclusion

Machine learning is a set of algorithms that can be used to solve problems. The algorithm learns from the data and uses the knowledge obtained to predict the new data. Machine learning algorithms are based on statistical models, which are mathematical descriptions of how variables in data sets change together or over time. These models are trained by applying them to many examples of the same data set and similar data sets with different characteristics. Once these models are trained, they can make accurate predictions of

invisible data when new inputs are given (for example, if we use our model to predict customer churn after observing the churn rate of previous customers). Therefore, this paper studies the application of machine learning algorithm in the field of marketing. Deeply understand the database marketing means algorithm to lay the the construction of models.

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