



International Conference on Knowledge Based and Intelligent Information and Engineering Systems, KES2017, 6-8 September 2017, Marseille, France

Classifying and Understanding Prospective Customers via Heterogeneity of Supermarket Stores

Takamasa TANAKA^{a*}, Tomohiro HAMAGUCHI^b, Takumi SAIGO^c, Kazuhiko TSUDA^d

^aGraduate School of System and Information Engineering, University of Tsukuba, Bunkyo, Tokyo, 112-0012, Japan

^bM3, Inc., Minato, Tokyo 107-0052, Japan

^cNTT DATA Corporation., Koutou, Tokyo 135-6033, Japan

^dGraduate School of Business Science, University of Tsukuba, Bunkyo, Tokyo, 112-0012, Japan

Abstract

In recent years, the supermarket industry in Japan is in a state of declining sales over the long term, and market contraction is expected to continue due to environmental changes such as demographic changes. In this research, as a support for supermarket managers placed under such circumstances we suggest a new method to classify good customers who should be kept top priority. We define good customers on the basis of not only current good customers but also customers who generate most of sales in the future and classify good customers in advance from the current information. Additionally We provide goods information for outstanding purchase by good customers to supermarkets. It can be expected to contribute to the improvement of management efficiency by utilizing it for sales promotion activities.

© 2017 The Authors. Published by Elsevier B.V.
Peer-review under responsibility of KES International

Keywords: RFM, Customer Relationship Management, Logistic Regression;

1. Introduction

The Japanese supermarket industry has been in a state of declining sales over the long term since the 1990s for more than 20 years [1]. The background to this is environmental changes such as a decrease in the number of visitors to the store due to the declining population and the aging population, and a decline in the unit price of customers [2]. As one measure to deal with this market shrinking phase, there is a method to realize management that maintains existing customers.

* Corresponding author. *E-mail address:* tanakatkm@gmail.com

As one means of realizing it, a method of realizing advertisement distribution for individual customers by using information and communication technology and increasing efficiency of sales promotion activities attracts attention. First, although it is an advertisement medium, sales promotion has been carried out to unspecified number of customers, that is, markets, using advertisement distribution media as conventional televisions and newspaper folding leaflets. On the other hand, in individual advertising methods, receipts issued at stores, information communication devices such as smartphones owned by customers, information communication devices attached to shopping baskets to be rented by stores are used as advertisement distribution media [3] [4].

These individual advertisements are realized by analyzing the ID-POS data and predicting items that an individual customer wants or will purchase. Activities to make such sales promotion activities more efficient are actively being conducted in domestic and overseas supermarkets. Especially Japanese supermarket managers cite such efforts as a focus area for advertising and publicity activities in the future [5].

As a representative example of supermarket sales promotion activities using ID-POS data, there is consideration of merchandise merchandise using association rule analysis. In addition, there are product recommendation for each customer using collaborative filtering that has greatly developed in the field of e-commerce (EC) [6]. These methods are effective methods aiming at improving the sales of the entire customer of the store.

Therefore, this research proposes a method specialized for the purpose of maintaining existing customers. Specifically, we propose a method to define high-quality customers that should be kept top priority among existing customers, and to classify high-quality customers from the whole customer. Furthermore, we propose to classify high-quality customers and to utilize it for advertisement specialized for high-quality customers by clarifying the characteristic items of purchased items for high-quality customers. By doing this, we realize a management-specific method that maintains existing customers that respond to the market shrinkage phase faced by the Japanese supermarket industry.

2. Customer Analysis

In this research, in order to classify superior customers of supermarket chain, we propose a new method extending RFM analysis which is traditional customer classification method. RFM analysis is a method of expressing customers using three indicators, Recency, Frequency, and Monetary [7]. Recency is more recently coming to the store, Frequency more frequently visits, Monetary shows total purchase amount. In RFM analysis, various extensions have been proposed corresponding to the tasks to be addressed, and in Section 2-1., They will be explained as related research. In addition, there have already been many studies dealing with supermarket management issues, and we will explain them in section 2-2. In Section 2-3, we explain related research and the position of this research, which we have covered in the previous section.

2.1. Research on extension of RFM analysis

Chen and colleagues propose an extended model of RFM analysis for the challenge prediction problem of customers in the logistics industry. We reported LRFMP model by adding the length of customer's term of membership (Length) and the recorded profit (Profit) to the RFM indicator, and showed improvement in suggestion obtained from cancellation prediction accuracy and model It is [8]. Bizhani and colleagues also proposed a technique combining RFM indicators and periods as customers for bank customer segmentation [9] as a research that adds a term perspective to the RFM indicator. In addition, Wu et al. Used demographic information such as RFM index, patient period, gender and age, Bayesian network in analysis of pediatric dental patients [10]. In addition to the addition of indices, research that combines machine learning methods has also been reported. Chan et al. Proposed a method combining RFM analysis and group intelligence for customer segmentation of car dealers [11]. Kim et al. Discovered patterns of patents that became important in the future by classifying RFM indices from patent usage data and performing decision tree analysis [12]. Poel and colleagues propose combining questionnaires such as RFM indicators and brand images, Bayesian model, and quantile point regression against the cancellation customer prediction of newspapers [13]. As another extension of the classification method of the RFM index itself, Zeng et al. Subdivided the RFM index into ten indicators such as the average number of visits to the store per month, the maximum value, the minimum value, etc. for the customer segmentation of the home dough shop We

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات