

Abstract: A battery of studies has applied the Word2Vec model to marketing problem by using large-scale shopping data, such as Prod2Vec, Item2Vec, and Meta-Prod2Vec. They show that the framework of Word2Vec outperforms existing models in the prediction of sales. However, these existing approaches lack the interpretability of the model since the Word2Vec framework cannot evaluate the effect of variables, which may limit its use in the marketing, such as the effective personalization and targeting. This study proposes a machine learning model by extending these works in several directions: (i) embedding receipt that is characterized as multiple purchase in a shopping trip. This derives implications by vector representation of receipt, that is, (ii) identifying shopping mission of customers by clustering receipt vectors, (iii) identifying price and seasonal effects. Our model contains the seasonal and promotion terms in the form of state space prior. We proposed a novel approach in this study by involving the concept of receipt vector into the Item2Vec framework, as well as the prior structure which represents the dynamic preference shift of the receipt by incorporating state space prior combined with the likelihood constituted by product2vec model. Our study highlighted the importance of the marketing environment when forecast the market basket for the future trips. The results of empirical results help managers understand the purchasing patterns and preference shift for a certain customer in different marketing environment.