

**A Unified View of Social and Temporal Modeling for B2B Marketing Campaign Recommendation**

**Abstract:**

Business to Business (B2B) marketing aims at meeting the needs of other businesses instead of individual consumers, and thus entails management of more complex business needs than consumer marketing. The buying processes of the business customers involve series of different marketing campaigns providing multifaceted information about the products or services. While most existing studies focus on individual consumers, little has been done to guide business customers due to the dynamic and complex nature of these business buying processes. To this end, in this paper, we focus on providing a unified view of social and temporal modeling for B2B marketing campaign recommendation. Along this line, we first exploit the temporal behavior patterns in the B2B buying processes and develop a marketing campaign recommender system.

Specifically, we start with constructing a temporal graph as the knowledge representation of the buying process of each business customer. Temporal graph can effectively extract and integrate the campaign order preferences of individual business customers. It is also worth noting that our system is backward compatible since the participating frequency used in conventional static recommender systems is naturally embedded in our temporal graph. The campaign recommender is then built in a low-rank graph reconstruction framework based on probabilistic graphical models.

Our framework can identify the common graph patterns and predict missing edges in the temporal graphs. In addition, since business customers very often have different decision makers from the same company, we also incorporate social factors, such as community relationships of the business customers, for further improving overall performances of the missing edge prediction and recommendation. Finally, we have performed extensive empirical studies on real-world B2B marketing data sets and the results show that the proposed method can effectively improve the quality of the campaign recommendations for challenging B2B marketing tasks.

**Existing System:**

Developing such a B2B marketing campaign recommender system, however, is a nontrivial task. The buying processes in B2B markets usually involve series of different marketing campaigns providing multi-faceted information to multiple decision makers with different focal points and motivations. These processes are naturally dynamic and complex. As a result, to recommend the right campaign at the right time, it is important to identify the customer behavior patterns hidden in the buying processes, so as to meet the dynamically changing information needs of the business customers.

**Proposed System:**

We further improve our NCTR framework and propose the graphical model approach—NCTRG. First, we present the low-rank temporal graph reconstruction as a probabilistic graphical model. The graphical model intuitively demonstrates the components (and their statistical relationship) in the graph reconstruction framework. The graphical model also incorporates appropriate distribution priors to avoid over-fitting issues. Second, although the temporal graph used in our preliminary work naturally embedded the campaign participating frequencies of the business customers, our preliminary work factorized these frequencies without careful probabilistic justification.