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Cold-Start Product Recommendation Using Microblogging Information: Linking Social Media To E-Commerce

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ABSTRACT

The lines between online shopping and social networking have blurred in recent years. Social login allows users to access their favourite e-commerce sites by logging in with credentials from their existing account on a third-party social network like Facebook or Twitter. Additionally, customers can promote their recent purchases on microblogs by including links to the item pages on the merchant's website. To recommend products from e-commerce websites to users on social networking sites in "cold-start" situations, this paper proposes a novel approach to the under-explored problem of cross-site cold-start product recommendation. The challenge of figuring out how to use knowledge extracted from social networking sites is a major one in implementing cross-site cold-start product recommendations. To facilitate the mapping of social networking features to another feature representation for a product recommendation, we propose using users who have accounts on both social networking sites and e-commerce sites as a bridge. To be more specific, we propose using recurrent neural networks to learn feature representations for users and products (termed user embedding's and product embedding's, respectively) from data collected from e-commerce websites, and then employing a modified gradient boosting trees method to transform users' social networking features into user embedding's. After acquiring user embedding's, we develop a feature-based matrix factorization approach to cold-start product recommendations. Experimental results on a large dataset constructed from SINA WEIBO, the largest Chinese microblogging service, and JINGDONG, the largest Chinese B2C e-commerce website, confirmed the efficacy of our proposed framework.

Keywords : Online Store , Online Business I, Jingdong, Sina Weibo

I. INTRODUCTION

The lines between online shopping and social networking have blurred in recent years. Social network features, such as instantaneous updates and interactions between users, can be found on e-commerce sites like eBay. Social login is a feature

offered by some online stores that enable new customers to register with their existing credentials from a social media platform like Facebook, Twitter, or Google+. A "buy" button, accessible via advertisements or other posts, was introduced on both Facebook and Twitter in the past year, allowing users to make purchases without leaving the sites. Strategically investing in SINA WEIBO1 allows e-commerce giant ALIBABA to reach Chinese internet users with product advertisements. Data extracted from social sites is crucial especially in light of the growing popularity of using these platforms for e-commerce.

In this paper, we investigate the intriguing challenge of making product recommendations from e-commerce sites to social networking site users in "cold-start" situations, where no previous purchase data exists.

We referred to this issue as "cold start" product recommendations across multiple sites. Even though online product recommendation has been studied extensively, most studies only concentrate on building solutions within specific e-commerce websites and primarily use users' historical transaction records. Cross-site cold-start product recommendation appears to be an underexplored area. Because of the nature of the problem we're trying to solve, we're limited to using the users' social networking information to make recommendations.

To overcome this difficulty, we propose connecting users' social networking features to latent features for product recommendation through the shared users between social networking sites and e-commerce websites. To be more precise, we propose using recurrent neural networks to learn feature representations (called user embedding's and product embedding's, respectively). After learning user embedding's, we create a feature-based matrix factorization method to use for cold-start product recommendations.

II. RELATED WORK

Possibility-based framework for advising on online purchases: Just the right product, at just the right time:

The primary goal of most current e-commerce recommender systems is to match a user with a product they are more than likely to buy and enjoy. However, the timing of a recommendation can have a significant impact on its success. Take the brand-new laptop owner as an example.

If the laptop's original battery tends to stop holding a charge around the two-year mark, she may buy a replacement battery at that time and then a new laptop at the end of the four-year mark. In this case, it would be inappropriate to suggest that the user buy a new laptop or a replacement battery so soon after making the initial purchase. Getting the right product recommendation at the wrong time can lower the user's opinion of the recommender system.

While it's important for a system to recommend the most applicable item, we argue that it's also important for it to recommend at the optimal time.

The paper investigates the contemporary issue of making timely product suggestions. Here, we apply the proportional hazards modelling strategy from survival analysis to the study of recommendations and propose a new opportunity model for including time in an online store's individualized product recommendations.

III. SYSTEM ANALYSIS

3.1 EXISTING SYSTEM:

- Studies typically only look at specific e-commerce sites, and even then, they only look at solutions built with users' past transaction data. Cross-site cold-start product recommendation appears to be an underexplored area.
- The cold-start recommendation problem is also the subject of a substantial body of literature.
- In order to predict ratings for new users, Seroussi et al. proposed incorporating data from users' public profiles..
- The ensemble learning algorithm proposed by Zhang et al.
- Schein suggested a technique that would incorporate content and collaborative data into a unified probabilistic model.
- Using social data, Lin et al. solved the "cold-start" problem for app recommendations.

3.1.1 Disadvantages of the Current System

- Our cross-site cold-start product recommendation task is different from theirs in that they only consider the brand or category-level purchase preference based on a trained classifier.
- In contrast to the wide variety of features we investigated, they only consider gender, age, and Facebook likes.
- In order to solve the cross-site cold-start recommendation problem, they neglect to think about how to convert the varied data collected on social media platforms into a format suitable for use in online stores.

3.2 PROPOSED SYSTEM

- In this paper, we investigate the intriguing issue of making product recommendations from e-commerce sites to social networking site users in "cold-start" situations, where no previous purchase data exists. We referred to this issue as "cold start" product recommendations across multiple sites.
- Because of the nature of the problem we're trying to solve, we're limited to using the users' social networking information to make recommendations. To overcome this difficulty, we propose connecting users' social networking features to latent features for product recommendation using the shared user base of social media and online stores (users who have social networking accounts and have made purchases on e-commerce websites).
- We specifically propose using recurrent neural networks to learn feature representations for users and products (termed user embedding's and product embedding's, respectively) from data collected from e-commerce websites, and then using a modified gradient boosting trees method to transform users' social networking features into user embedding's.
- Next, we use the user embedding's we've learned to power cold-start product recommendations using a matrix factorization method based on feature engineering.

3.2.1 BENEFITS OF THE SUGGESTED SYSTEM:

- The cross-site cold-start product recommendation problem can be solved using our proposed framework.
- We expect our study to have far-reaching consequences for academic and commercial settings alike.

IV. SYSTEM DESIGN

4.1 SYSTEM ARCHITECTURE

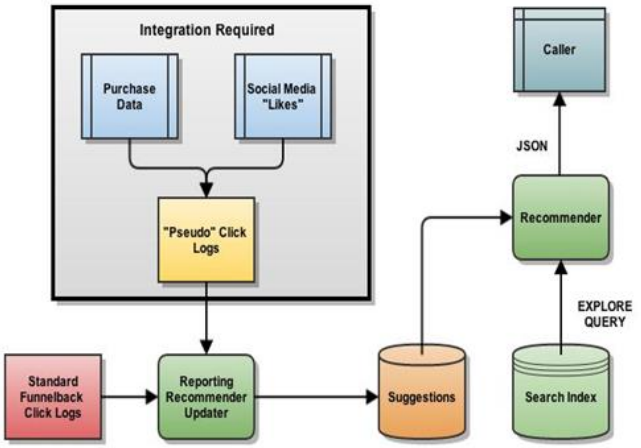

Fig: 4.1 system architecture

V. RESULT

The study states that social media and e-commerce are interconnected by each other.by using embedded system and microblogging system we can provide the user of both social media and e-commerce facilities in the same application. Also it helps the sellers to improves their business by recommending the required product for the user by data mining techniques. It collects user's data at the time of login and based on the data it provides recommendation of the required product and also Which increase the business we use peer to peer network for this particular paper. So but the limitation is we can only add the products and can review the product. almost customers purchase the product based on the previous reviews.so here we can provide the reviews as well.

We are certain that our view point towards the issue can be an impactful change in how consumers use

recommendations to shop online. We hope that this can reform how people use their social media to look for products that fit their requirements and also help e-commerce websites to reach their target audience with the right recommendation. This outlook is only a basic proposed solution; furthermore many effective-advance methods such as Convolutional Neural Network13 can be implied for feature learning.

VI. CONCLUSION

In this project, we investigate a new challenge: how to recommend products from e-commerce sites to microblogging users who don't have any purchase history. Our central thesis is that, through feature learning using recurrent neural networks, e-commerce website users and products can share a common latent feature space. Users who have accounts on both e-commerce and social networking sites can be used as a bridge to learning feature mapping functions by employing a modified gradient boosting trees approach. This approach maps users' attributes extracted from social networking sites onto feature representations learned from e-commerce sites.

Incorporating the mapped user features into a feature-based matrix factorization approach for cold-start product recommendation is a powerful strategy.
Using WEIBO and JINGDONG, we have assembled a sizable dataset. Our findings validate the efficacy of our proposed framework in solving the cross-site cold-start product recommendation issue. We anticipate significant repercussions from our study for academia and business alike.To learn user and product embedding's, traditional methods have only used a basic neutral network architecture. We can look into more cutting-edge deep learning models for feature learning in the future, like Convolutional Neural Networks13. In addition, we'll think about how to enhance the current feature mapping technique by transferring learning ideas.

VII. FUTURE WORK

Additional deep learning models, such as Convolutional Neural Networks13, can be investigated for feature learning in the future. We will also think about how to enhance the current feature mapping method using concepts from transfer learning. Learned user and product embedding's have previously only been implemented using a basic neutral network architecture. It is possible to improve the solution by attempting to identify more qualified traits from the client's online networking about the client, which will aid in the appropriate evaluation of the client's interest. Existing solutions may be integrated with it, such as linked product recommendation, which suggests complementary items to those already in a customer's inventory.

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