

# iCTRE: The Informal community Transformer into Recommendation Engine

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**Abstract-** Presently human is encompassed by a colossal measure of data on the web. That highlights the continuous need of recommendation or suggestion systems in the different areas. Tragically cold start problem is still a critical issue in these systems on new clients and new items. The problem becomes more critical in systems that contain resources that lives too in a matter of seconds like offers on items which remains just for few days (short life resources - SLiR), or news in a news site. From the opposite side social networks are extremely rich with clients' data, shockingly the majority of the proposed social recommender are connected on domain specific social networks like flickers and epinions which are substantially less utilized as a part of the everyday life, since managing General Purpose Social Network (GPSN) like Facebook and Twitter needs to change these GPSN into a valuable source of recommendation dealing with them as row, implicit or unary data. In this work we highlight how iCTRE (Informal community Transformer into Recommendation Engine) addresses this challenge by changing the GPSN into valuable data for recommendation based on middle layer of domain concepts. iCTRE defeats the cold start problem on new clients and items. It has been assessed over Twitter, on new clients, suggesting offers as a sort of SLiR, results demonstrated that iCTRE succeeded in suggesting great offers with 14% of click on suggested offers, which is high contrasted with general open rate in online networking, particularly when we don't have anything about clients and we are suggesting SLiR resources.

## Introduction

Now-a-days recommendation is everywhere; all around us, from choosing a movie, a restaurant as well as a hotel. Recommendation has become an very essential part of humans daily life. So collaborative filtering techniques are mostly used to achieve recommendation. In collaborative filtering technics the user is recommended items based on his top N similar users, according to that information the recommendation is provided to that person. If the user consumes the recommended items, this will activate his similarity with others to ultimately follow the mass behavior. Collaborative filtering suffers usually from cold start problem at the level of users and items. Cold start problem happens when new item, for example, has not any actions yet meaning it will not be suggested and not

attracting users' actions and will and will remain in an endless loop. On the other hand, items with a considerable measure of activities will be exceptionally suggested. The problem is even present in systems with Short life Resources (SLiR), where items appear and disappear before having enough actions to be recommended, like news in a news site, or offers on products in commercial sites. The product itself can live for longtime, but the offer disappears after few days, an example of an offer is: "50% discount on a Canon Camera", here the 50% discount is the offer, and the Canon Camera is the product. The solution to this problem is content based solution technique. In this technique the item can be recommended based on his similar items. But a new user who has not yet provided actions can still occurs from a cold start problem. From other side mostly people prefers social networks like Facebook , Twitters also Domain Specific Social networks like Flickers for and Epinions. Social networks provides more and more voluntary personal information of users. Recommendation using social media is not new concept. Many solutions were proposed to overcome the recommendation by using the social information like the trust, and the friends' relations as well as works The main techniques used to achieve this goal are the matrix factorization methods, as well as the neighbor based ones, these solutions result in better accuracy over the Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE) metrics used usually to evaluate recommendation systems. The main drawback of most of these solutions is that they are applied over domain specific social networks like Flickers, Epinions, which are recommendation oriented social networks, they contains users, relations, items and ratings. That is why they are much easier to be used to enhance recommendation or to apply a new theory in recommendation. In addition, solutions are tested offline over datasets available on the net. Besides this domain specific social networks attack much fewer users than the general purpose ones. iCTRE is addressed to overcome this drawback, it is a generic model that transforms users' actions in online social networks (like Twitter and Facebook) into concepts, then it builds a matrix of concepts. The resulting matrix can be used to offer recommendation benefiting from any collaborative filtering algorithms. iCTRE can work alone in new systems or in collaboration with other recommendation systems. As iCTRE is based on extracting concepts from social networks it does the same thing at the level of resources that are to be recommended extracting their concepts also. Then by merging the 2 matrix of (user-concept) and (resource-concept) iCTRE will have a User-Resource Matrix that can be used to offer recommendation. Concepts are used as a middle layer between users and resources. At the evaluation issue, metrics like the Root Mean Square Error (RMSE) or Mean Absolute Error (MAE) are usually used to evaluate the prediction accuracy, but they can't guarantee a good recommendation

## **Problem Statement**

Collaborative filtering techniques are mostly used to achieve recommendation. But collaborative filtering suffers usually from cold start problem at the level of users and items. On the other hand, items with a considerable measure of activities will be exceptionally suggested. The problem is even present in systems with Short life Resources (SLiR), where items appear and disappear before having enough actions to be recommended, like news in a news site, or offers on products in commercial sites. The product itself can live for longtime, but the offer disappears after few days

## **Existing System**

The existing system uses Collaborative filtering techniques for recommendation to users. But collaborative filtering suffers usually from cold start problem at the level of users and items. The problem is even present in systems with Short life Resources (SLiR), where items appear and disappear before having enough actions to be recommended, like news in a news site, or offers on products in commercial sites. The product itself can live for longtime, but the offer disappears after few days. The solution to this problem is content based solution technique. In this technique the item can be recommended based on his similar items. But a new user who has not yet provided actions can still occurs from a cold start problem.

## **Disadvantage of Existing System:-**

The existing system are applied over domain specific social networks like Flickers, Epinions, which are recommendation oriented social networks, they contains users, relations, items and ratings that's why cold start problem is not solved.

## **Proposed System**

The proposed system designs iCTRE module which overcome this problem, it is a generic model that transforms users' actions in online social networks (like Twitter and Facebook) into concepts, then it builds a matrix of concepts. The resulting matrix can be used to offer recommendation benefiting from any collaborative filtering algorithms. . iCTRE was evaluated on Twitter, live tests were done on real users to recommend them offers over products like an example of SLiR resources. Results were so encouraging so far. iCTRE not only solve the cold start problem, but also protects the users from entering their interests in different systems.

### **Advantage of Proposed System:-**

- iCTRE, that transforms users actions in GPSN into a source of recommendation based on domain concepts.
- iCTRE not only solve the cold start problem, but also protects the users from entering their interests in different systems.

### **Literature Survey**

#### **[1] Social Media Recommendation**

**Zhi Wang, Wenwu Zhu, Peng Cui, Lifeng Sun and Shiqiang Yang**

Social media recommendation is foreseen to be one of the most important services to recommend personalized contents to users in online social network. It forces great challenge due to the huge behavior of users and the large-scale volumes of contents generated by the users. we first present the principal of social media recommendation. Then we present the framework of social media recommendation, with a focus on two important types of recommendations interest-oriented social media recommendation and influence-oriented social mediare commendation. For each case, we present the design of the recommendation that takes both social property and content property into account, such as users relations, contents similarities, and propagation patterns. Further, we present theoretical results and observations on the social media recommendation approaches.

#### **[2] Social Media Recommendation based on People and Tags**

**Ido Guy, Naama Zwerdling, Inbal Ronen, David Carmel, Erel Uziel IBM Research Lab Haifa 31905, Israel {ido,naamaz,inbal,carmel,erelu}@il.ibm.com**

We have to discuss that personalized item recommendation in an enterprise social media application suite that includes blogs, bookmarks, communities, wikis, and shared files. Recommendations are based on two of the elements of social media people and tags. Relationship information among people, tags, and items, is collected and aggregated across different sources within the enterprise. Based on these aggregated relationships, the system recommends item related to people and tags that are related to the user. Each recommended item is accompanied by an explanation that includes the people and tags that led to its recommendation and their relationships with the user and the item. We evaluated our recommender system through an extensive user study. Results show a significantly good interest ratio for the tag-based recommender than for the people-based recommender, and an

even better performance for a combined recommender. Tags applied on the user by other people are found to be very effective in representing that user's topics of interest.

### **[3] LIKE and Recommendation in Social Media**

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Massive social media data with rich LIKE-like relationships there in, recommendation techniques has been proven to be active in mitigating the information overload problem. They have demonstrated their strength in improving the quality of user experience, and positively impacted the success of social media. New type of data introduced by social media not only provide more information to advance traditional recommender systems and manifest new research possibilities for recommendation. With the explosive increase of massive amount of user generated contents and relationships there of found in WWW and social media, the topic covered in this tutorial is timely and important. As such, the summarized coverage of the topic in general and described presentation on the selected techniques in particular would be a useful tutorial to WWW conference and participating audience.

### **[4] Social Media, Recommendation Engines and Real-Time Model Execution: A Practical Case Study** Phil.Winters@KNIME.COM Zeller [Michael.Zeller@Zementis.com](mailto:Michael.Zeller@Zementis.com)

Social media is of course very hot even if no longer a new topic. In our context(event), social media provides not only a mechanism for individuals to communicate and share over common touchpoints of their choice but also to collect that information so that it can be used to provide a good experience. Recommendation engines are not new they take forms from market basket analysis in retail to advanced analytic systems providing next best offer or activity suggestions. They are also very popular for making suggestions or recommendations of similar items when a particular product or offering is selected. Amazon is probably the famous example that uses recommendation engine analytics. In the past, all types of recommendation-based analytics were quite difficult to automate as the data preprocessing and model creation and maintenance required were full of complex and generally needed different systems working together. KNIME, as a robust analytics platform, simplifies this process by providing all core functionality in one workflow needed to create a recommendation engine.

**[5] National Student Nurse Association, Inc. 45 Main Street, Suite 606, Brooklyn, New York 11201 Recommendations For: Social Media Usage and Maintaining Privacy, Confidentiality and Professionalism**

Student nurses have a responsibility to understand the benefits and consequences of participating in social media; NSNA recommendations encompass personal and professional social media use. Healthcare organizations & Universities that utilize electronic and social media typically have policies in place to govern employee or student use of such media in the workplace. The policies often don't address the nurses' use of social media outside of the workplace, or outside of the clinical setting. It is in this context that the nurse or student nurse may face potentially serious consequences for inappropriate use of social media.

**[6] An Analysis and Recommendations of the Use of Social Media within the Cooperative Extension System: Opportunities, Risks, and Barriers Honors Lucas Clayton Fuess May 2011 Dr. Lee Humphreys**

Social media has become a big and integral component of how people spend their time online; people are spending enormous amounts of time on websites used to share information and connect with people. New forms of relationship buildings and social capital occur through social networking sites. Within Cooperative Extension, it is imperative to keep up with evolving forms of communication to connect with changing audience. Interviews were conducted throughout New York and Wisconsin with educators in both rural and urban counties, with varying amounts of social media experience, and backgrounds. A cross state study was conducted to check if results were consistent in unique areas. Questions asked determined how Cooperative Extension is using social media to connect with people in different ways, if social media was an effective communication platform, and if it is worth it for Cooperative Extension to utilize this resource. Data collected about the advantages of social media and its perceived opportunities, risks, and barriers for use. Conclusions drawn indicate people are excited about a new, free, and opportunity to connect with others. Concerns contain time spent using social media, a perceived lack of privacy and control of the websites, and a lack of training opportunities for extension educators.

**[7] Effectiveness of the use of social media a report for public health**

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Social media is currently utilized by public health organizations both as a broadcasting platform to amplify messages from traditional media sources (e.g., radio, television) and as an entirely new way of collaborating and co-creating content with target audiences. In the latter approach, organizations have to adapt their communicating strategies to incorporate user generated and created content and feedback. The process of engaging users to co-create content, to rate and comment on communications, more so than the resulting message, is increasingly perceived to give a heightened authentication to messages, improving trust in, and building users' relationship with organizations. Social media, unlike traditional media campaigns, provides best opportunities to embed and interject public health messaging into the daily online conversations of Canadian people. In the future, it will also allow public health coordinators to deliver a range of health promotion messages and self-monitoring tools through mobile applications, an innovation that will potentially increase the reach to those without computer devices, and will allow public health messaging to penetrate the day-to-day health conversations and activities of Canadians. The adaptation of social media by leading public health organizations reflects a wide sense that these tools are increasingly necessary to reach demographics who are abandoning traditional broadcast technologies such as teens, or a significant portion of the public who are transforming the manner in which they interact with experts.

**[8] User comments for news recommendation in forum-based social media Qing Li Sa,<sup>†</sup>, Jia Wang a, Yuanzhu Peter Chen b, Zhangxi Lin c a Southwestern University of Finance and Economics, China b Memorial University of Newfoundland, Canada c Texas Tech University, USA**

News recommendation and user interaction are important features in many Web-based news services. The former helps users to identify the most relevant news for further information. The latter enables collaborated information sharing among users with their comments following news postings. This research is intended to keep these two features together for an adaptive recommender system that uses reader comments to refine the recommendation of news in accordance with the evolving



topic. This then turns the regular “push data” type of news recommendation to “discussion” moderator that can intelligently assist online forums. In addition, to alleviate the problem of recommending essentially same articles, the relationship (duplicate, generalization, or specialization) between recommended news articles and the original posting is investigated. Our experiments show that our proposed solutions provide an improved news recommendation service in forum-based social media.

### **[9]On Social Networks and Collaborative Recommendation**

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Taking into account of both the social annotation and friendships inherent in the social graph established among users, items and tags, we created a collaborative recommendation system that effectively adapts to the personal information needs of each user. We adopt the generic framework of Random Walk with Restarts in order to provide with a more natural and efficient way to represent social networks. In this work we collected a representative enough part of the music social network last.fm, capturing explicitly expressed bonds of friendship of the user as well as social tags. We performed series of comparison experiments between the Random Walk with Restarts model and a user-based collaborative filtering method using the Pearson Correlation similarity. The results show that the graph model system benefits from the additional information embedded in social knowledge. In addition, the graph model outperforms the standard collaborative filtering method.

### **[10]Generic knowledge-based analysis of social media for recommendations**

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Recommender systems have been around for decades to help people find the best matching item in a predefined item set. Knowledge-based recommender systems are used to match users based on info



that links the two, but they often focus on a single, specific app, such as movies to watch or music to listen to. In this paper, we present our Interest-Based Recommender System. This knowledge-based recommender systems provides recommendations that are generic in three dimensions: IBRS is 1) domain-independent, 2) language-independent, and 3) independent of the used social medium. To match user interests with items, the derived from the user's social media profile, enriched with a deeper semantic embedding obtained from the generic knowledge base DB-pedia. These interests are used to extract personalized recommendations from a tagged item set from any domain, in any language.

### System Architecture

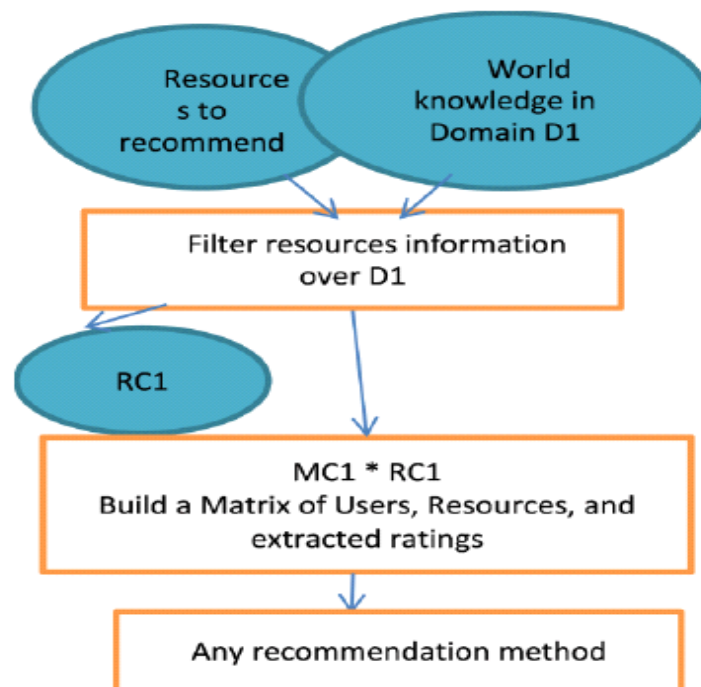


Fig. System Architecture[11]

### VII. CONCLUSION

We Design iCTRE, a framework that transforms users actions in GPSN into a source of recommendation based on domain concepts. In order to achieve this goal we had to deal with the extracted row data and transform this data into user, resource, extracted rating matrix. iCTRE was evaluated on Twitter, live tests were done on real users to recommend them offers over products like an example of SLiR resources. Results were so encouraging so far. iCTRE not only solve the cold start problem, but also protects the users from entering their interests in different systems. It proves also

that the spontaneous actions of users can be much useful in different domains. By iCTRE the user will not be only some previous ratings but also the concepts that are interesting for him, which is not the case in most of the existing recommendation systems like Amazon, and Epinions. So that the cold start problem of a new user can be transmitted to a warm start in any recommendation system. We still have a lot to do: we have to elaborate different strategies in the recommendation core, and to define how to link the matrix with existing recommender systems and to test the methodology over. We have to test our system in different datasets and systems, and to use other ways to conduct our experiments, and we're working on to test our work on Facebook. Moreover, the matrix of iCTRE can serve in different domains not only in the recommendation domain.

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[10] Generic knowledge-based analysis of social media for recommendations

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