



User Modeling on Twitter with WordNet Synsets and DBpedia Concepts for Personalized Recommendations

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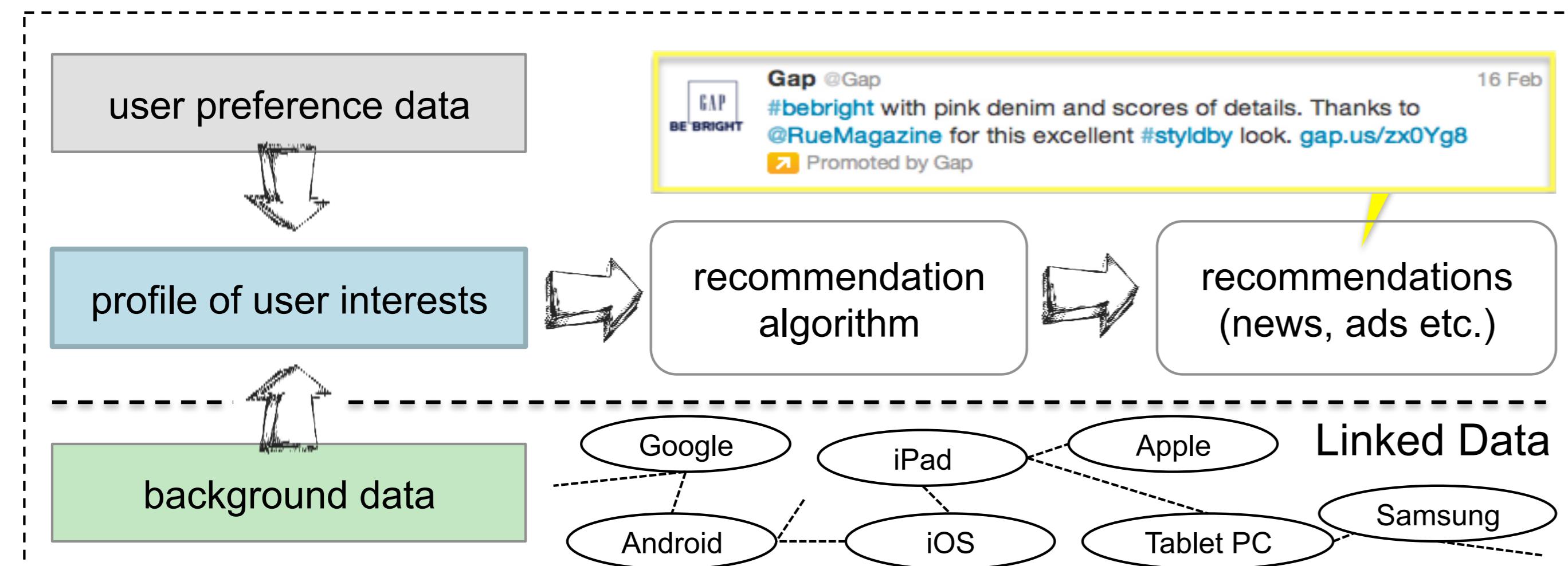
Introduction

Information overload on the current Social Web challenges users in their consumption of the information. **User modeling** for individual users plays a significant role in such a system and is a fundamental step for personalization as well as recommendations.



Figure 1. Information Overload on the Social Web.

Bag-of-Concepts approach using a Knowledge Base (KB) is preferred[1,2]:



Examples

Tweet#1: My Top 3 #lastfm Artists: Eagles of Death Metal(14), The Black Keys(6) & The Wombats(6)

Tweet#2: Just completed a 3.89 km ride. We're gonna need more...
→ No concept can be identified: concept-alone approach is not enough!

Proposed User Modeling Strategy

Leveraging WordNet synsets and DBpedia concepts together for user modeling

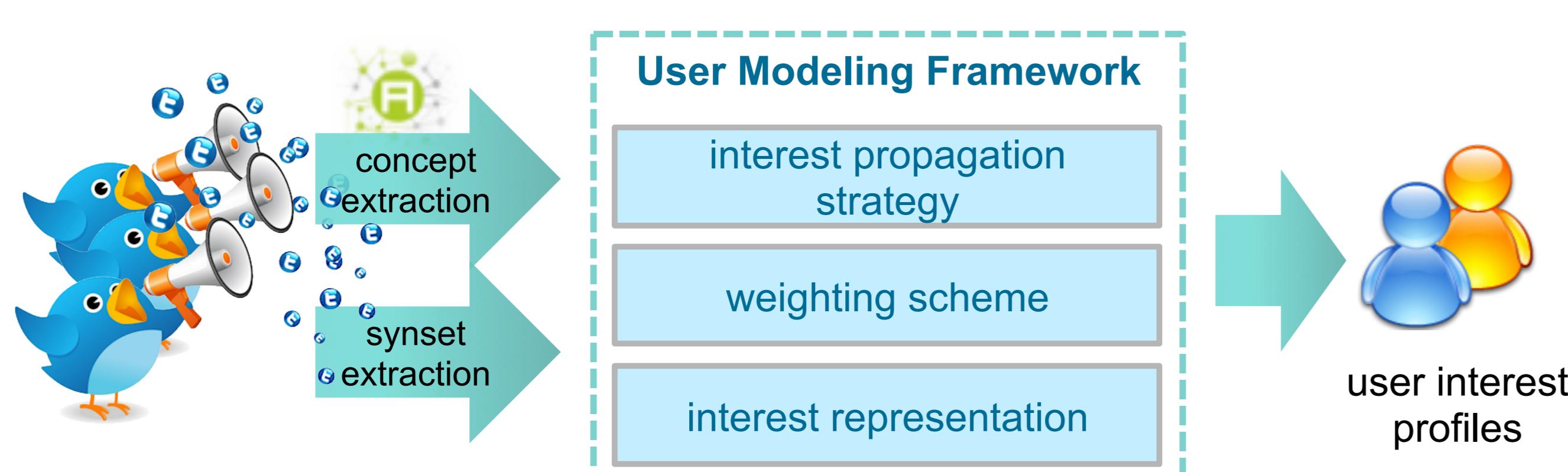


Figure 2. User Modeling Framework.

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$$\text{User Profile} : P_u = \{(i, w(u, i)) \mid i \in I, u \in U\} \quad (1)$$

Here, $I = \{s_1, \dots, s_k\} \cup \{c_1, \dots, c_m\} = \{i_1, \dots, i_n\}$ denotes the set of synsets in WordNet and concepts in DBpedia, and U denotes users.

Experiment Setup

Link Recommendations on Twitter

- task: recommending links using different user interest profiles as input
- item (link) profile: using the same modeling strategy based on the content of a link
- recommendation algorithm: cosine similarity

Evaluation Metrics

- MRR: Mean Reciprocal Rank
- S@N: Success rate at rank N
- R@N: Recall at rank N
- P@N: Precision at rank N

Preliminary Results

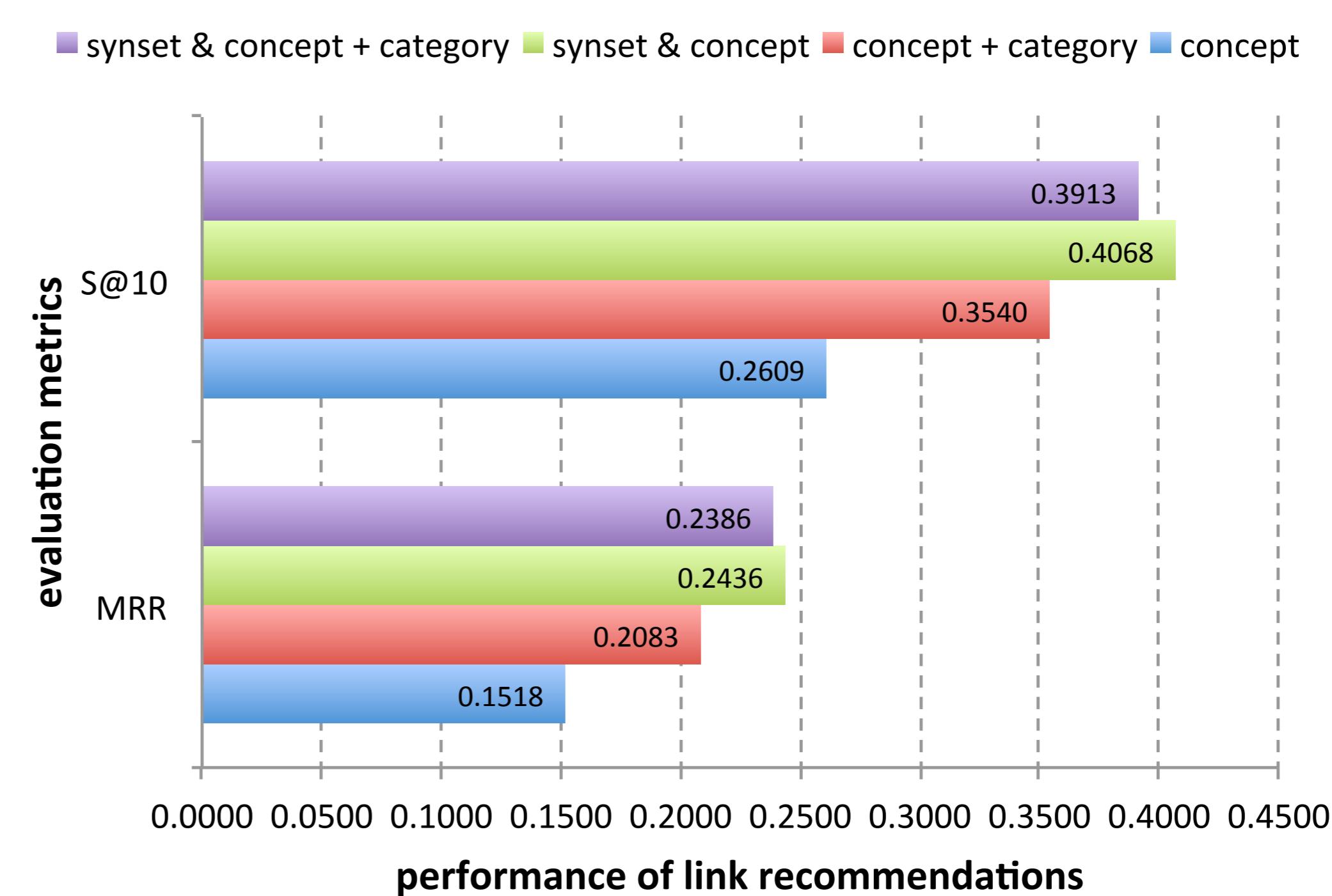


Figure 3. The quality of recommendations in terms of success rate and MRR (Mean Reciprocal Rank).

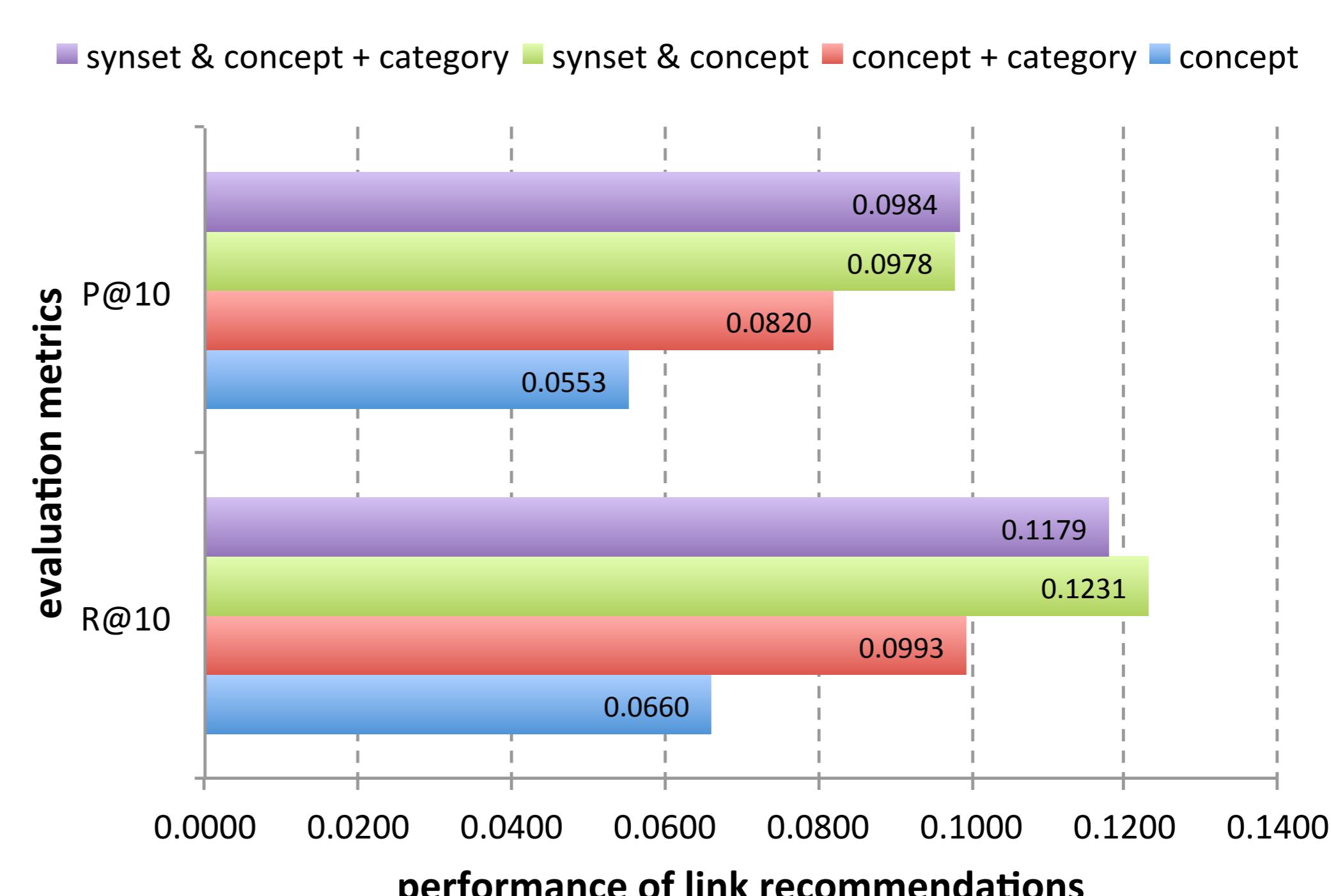


Figure 4. The quality of recommendations in terms of precision and recall.

References

- G. Piao and J. G. Breslin. Analyzing Aggregated Semantics-enabled User Modeling on Google+ and Twitter for Personalized Link Recommendations. UMAP'16.
- G. Piao and J. G. Breslin. Exploring Dynamics and Semantics of User Interests for User Modeling on Twitter for Link Recommendations. SEMANTiCS'16