Chapter 1
Exploratory News Recommendation

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ABSTRACT

Research on mobile news recommendation has become popular over the last few years, though the news domain is challenging and there are still few advanced commercial systems with success. This paper presents the exploratory news recommender system under development in the SmartMedia program. In exploratory news recommendation the reader can compose his own recommendation strategies on the fly and use deep semantic content analysis to extract prominent entities and navigate between relevant content at a semantic level. The readers are more likely to read a larger share of the relevant recommended articles, as there is no need to browse long tedious lists of articles or post explicit queries. The assumption is that more active and exploring readers will make implicit feedback more complete and more consistent with the readers’ real interests. Tests shows a 5.14% improvement of accuracy when our collaborative filtering component is enriched with implicit feedback that combines correlations between explicit ratings with the reading times of articles viewed by readers.

INTRODUCTION

In spite of recent successes of news recommender systems from for example Washington Post and New York Times (Nieman Journalism Lab, 2015; Washington Post, 2015), there are fundamental challenges in news recommendation that render many traditional recommendation strategies and algorithms unsuitable. Whereas most recommender systems or personalization software deal with structured and stable data, like in Amazon and Netflix, unstructured textual news articles are short-lived, overlapping and hard
to analyze or relate to user interests. Das et al. (2017) list item churn and scalability as major concerns in their Google News service. In Özgöbek et al. (2014) the news-specific challenges also include data sparsity, recency, implicit feedback, unstructured content and serendipity, among others.

In mobile news recommendation there are additional limitations with respect to user interaction modes and screen sizes that further complicate the usability of the systems and ultimately the learning of high-quality user profiles. Whereas users of recommender systems in general only reluctantly provide explicit feedback (Thurman, 2011), it seems even more difficult to encourage mobile users to submit ratings that can help the system improve its recommendations. Also, only a small portion of the recommended list can be shown at the same time on a mobile device, which potentially prevents the users from actually seeing and evaluating the news articles presented to her. However, since mobile news recommender systems have access to the readers’ immediate geospatial context and are directly available as news are unfolding, the systems may introduce locational and time-dependent recommendation features that go beyond what is feasible in desktop solutions.

This paper discusses the experiences with a mobile news recommender system that is under development in the SmartMedia program at NTNU in Norway. Central in this program is the development of recommendation approaches that take advantage of readers’ mobile availability while alleviating the problems of small screens and awkward input options. The intention is to develop a full context-aware and personalized news experience on the basis of deeper semantic analyses of news content and its relation to external sources. Linked data is employed to extract and disambiguate news entities that enable us to localize news, build and maintain semantic user profiles and follow trends and sentiments of news entities like people, organizations, and products.

The contribution of the paper is two-fold: Firstly, it introduces and explains a new concept in news recommendation, exploratory news recommendation, that allows readers actively to take charge of the recommendation process rather than providing feedback on system-generated lists only. This focus on exploration encourages users to reflect on their interests and be more conscious about what makes an article interesting and worth reading. Secondly, it shows how implicit feedback from reading times can be exploited to enhance system accuracy as readers get more active and leave more meaningful traces than just click-through logs.

The rest of the paper is structured as follows: Section 2 introduces the SmartMedia program for mobile news recommendation, in which the concept of exploratory recommender systems is introduced. Important related work – including the issue of implicit and explicit feedback – is discussed in Section 3. Whereas Section 4 shows how the news app is designed to support exploratory recommendations, the entity-based linking of articles for further drill-down is demonstrated in Section 5. An evaluation confirming the quality and value of implicit feedback in such recommender systems is explained in Section 6, followed by conclusions in Section 7.

BACKGROUND

The SmartMedia program at NTNU in Trondheim was established in 2012 as part of a collaboration with Norwegian telecom and media industry. With an emphasis on news recommendation and semantics, the program is investigating new and semantically deeper approaches for building real-world large-scale
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