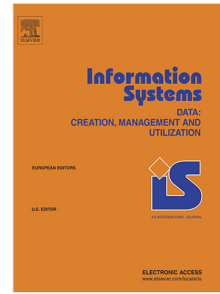


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The Pure Cold-Start Problem: a deep study about how to conquer first-time users in recommendations domains

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Abstract

The success of Web-based applications depends on their ability to convert first-time users into recurring ones. This problem is known as Pure Cold-Start and it refers to the capability of Recommender Systems (RSs) providing useful recommendations to users without historical data. Traditionally, the systems assume that items biased by popularity, recency and positive ratings suit the interests of most first-time users. However, our studies confirm a contra-intuitive hypothesis, showing users consumption preferences biased to non-popular items. For this reason, we introduce two new RSs to mitigate this problem based on user coverage maximization: Max Coverage and Category-Exploration. Offline experiments show that our recommendations complement the traditional ones. Thus, we found an opportunity for improvements on state-of-the-art RSs. We hypothesize that combining distinct non-personalized RSs can be better to conquer the most first-time users than traditional ones. An online study conducted with 236 real users in movie domain reinforced this hypothesis. Hence, this study provides a clear message: we should compose product pages that mix complementary non-personalized RSs.

Keywords: Non-personalized Recommender Systems, Pure Cold-Start problem, First-time Users, e-Commerce Systems

1. Introduction

Nowadays, the huge amount of information available in several Web applications generates a challenging scenario: users face more options than they can effectively handle [1]. Hence, tools that provide personalized content for users are becoming increasingly important. Recommender Systems (RSs) have affected decisively distinct business phases such as acquisition and retention of users. In the retention phase, RSs estimate personalized items based on a prior knowledge about users [2]. Indeed, RSs are the main responsible for generating 35% of sales for Amazon, 2/3 of the movies watched on Netflix and 38% more click-through on Google News currently [3].

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