

# Recommender Systems

Hannes Werthner  
*Vienna University of  
Technology, Austria*

Hans Robert Hansen  
*Vienna University of Economics and  
Business Administration, Austria*

Francesco Ricci  
*University of Bozen,  
Italy*

Recommender systems give advice about products, information or services users might be interested in. They are intelligent applications to assist users in a decision-making process where they want to choose one item amongst a potentially overwhelming set of alternative products or services. And they are probably among the most prominent applications having a substantial impact on the performance of e-commerce sites and the sector in general. In fact, even if the problem of supporting a choice decision process is quite old, it is only with the advent of the WWW that we had at disposal, in a large quantity, two basic ingredients of recommender systems: a large catalogue of products, as in e-commerce web sites, and a large population of consumers/users querying these web sites and leaving track of their on-line behavior. From their introduction, recommender systems have been exploited for recommending books, CDs, movies, news, electronics, travels, financial services, and many other products and services. Recommender systems are becoming more and more popular even in rather simple e-commerce web sites.

Research on recommender systems has overlapped many computer science and information systems topics, especially Information Retrieval and Artificial Intelligence were of major importance. From Information Retrieval, recommendation technology research derives the vision that users searching for recommendations are engaged in an information search process; from an Artificial Intelligence perspective, one views recommendation as a learning problem that exploits past knowledge about users. Many early recommender systems were designed to support simple, information search oriented human-computer interactions with two phases: user model construction and recommendation generation. The user model is typically acquired by either exploiting a collection of previous user-system interactions or information provided by the user during the recommendation session. Then the recommendation generation reduces to the identification of a subset of products that “match” the user model, according to a matching

function. For instance, in collaborative filtering the user model is comprised of the product ratings provided by the user, recommendations are computed by identifying a set of similar users according to their user profiles, and then recommending products highly rated by similar users. This simple behavior – user model definition and matching function – deviates from a more natural human-to-human interaction, where the user and the recommender (advisor) interact by exchanging requests and replies until the user accepts a recommendation. Focusing on these aspects conversational recommender systems were proposed. In such systems, there is no clear separation between user model construction and recommendation generation stages. In conversational systems a dialogue is supported, where at each stage the system has many alternative moves; it can ask the user for preferences, or request a feedback on a product, or suggest some products. The recommender is not seen any more as an oracle that can predict the user tastes and suggest the “right” option, it is more an “advisor” that is able to leverage multiple factors to guide the decision process.

In the Minitrack this rather computer science view is extended to business related issues as well as evaluation and user satisfaction. At the end the successful business idea / model and the related user behavior / interest decides about the success or failure of a service. This is – at least – what we have learned from the e-commerce hype, technologies have to be converted to services.

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