

# Towards a Group Recommender Process Model for ad-hoc Groups and On-Demand Recommendations

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## ABSTRACT

Movie recommender systems simplify the movie selection by providing movie suggestions based on the respective user's personal taste. Most of the current systems address individual users, support stationary use, and require pre-configuration. In this paper we present an approach for group recommendations for movies based on a novel group recommender process model for ad-hoc groups with on-demand recommendations.

## Categories and Subject Descriptors

H.5.3: Group and Organisation Interfaces – Computer-Supported Cooperative Work.

## General Terms

Algorithms, Performance, Experimentation, Human Factors.

## Keywords

Computer-Supported Cooperative Work, Group Recommender System, Group Recommendation Process, Mobile System.

## 1. INTRODUCTION

Recommender systems provide users personalised suggestions of choices to make that facilitate their decision-making especially in situations where they lack the personal experience of the alternatives [10]. They 'create recommendations tailored to individual users rather than universal recommendations for, well, everyone' [5, p. 15].

Early related work focused on individual users in work settings with stationary use. Many use collaborative filtering of user ratings for email recommendations based on users' annotations (e.g., Tapestry [2]) and for Usenet News recommendations based on users' ratings (e.g., GroupLens [9]). More recent systems still mostly target at single users, but in leisure and mobile scenarios. Some use preferences and locations of users to make real-time suggestions of places (e.g., Restaurant Recommendation [8]); others synchronise recommendations from personal computers to mobile devices to provide later offline recommendations on the spot (e.g., MovieLens Unplugged [4]). Only few aim to support groups to find a compromise. For instance, PolyLens [7] provides group recommendations as single movies fitting the group members' taste best.

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GROUP'10, November 7–10, 2010, Sanibel Island, Florida, USA.  
ACM 978-1-4503-0387-3/10/11

In this paper we present a novel group recommender process model for ad-hoc groups with on-demand recommendations and its instantiation in an interaction concept implemented in the Ad-hoc Group Recommendations Mobile (*AGReMo*) app. Ad-hoc groups can spontaneously form and start a recommender process. On-demand recommendations allow to use the mobile app anyplace and anytime without pre-configuration.

In the following we introduce the process model and the derived interaction concept of *AGReMo* as well as the *AGReMo* implementation, and summarise the paper.

## 2. PROCESS MODELL

The *AGReMo* group recommender process model for ad-hoc groups with on-demand recommendations specifies a comprehensive sequence of steps for the efficient interaction of groups seeking a shared movie recommendation. The process model departs from a thorough understanding of the decision process [cf. 3] as well as user interaction and comfort [cf. 1, 6]. It has three phases: Preparation, Decision, and Action (cf. Figure 1).

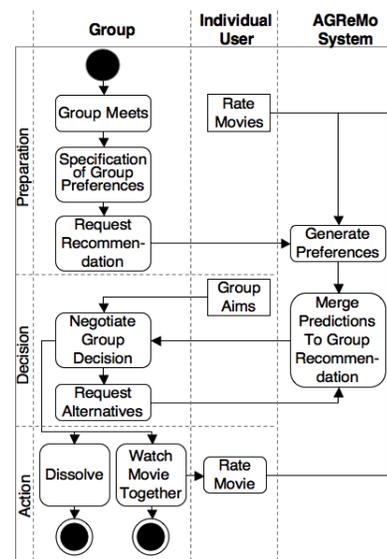


Figure 1. *AGReMo* Process Model.

We provide details of the sequence of steps and individual steps as we introduce the *AGReMo* group interaction concept below.

### 3. GROUP INTERACTION CONCEPT

The *AGReMo* group interaction concept leverages on the group process model and was designed to facilitate the interaction of the group with the *AGReMo* app. It combines the theoretical concepts of the process model with the practical insight gained from low-fidelity and high-fidelity prototyping of the *AGReMo* app. The *AGReMo* group interaction concept follows the above phases and was implemented in the *AGReMo* app for the Apple iPhone. Subsequently we describe the concept from the perspective of the users using the *AGReMo* app.

The users start with the *Preparation Phase*. The group meets and specifies its preferences. As personal preferences, individual users rate movies they already watched. The system then generates individual profiles based on each user's ratings.

After login the main view of the *AGReMo* app (cf. Figure 2) allows starting a recommendation process and shows recent group recommendations. The agent, on which the group members agree, specifies the group's preferences, and enters the essential and optional attributes on one view.

Essential attributes are group members, vote weights of the group members, and date and time to watch the movie. The agent selects group members from a friend list. In the *AGReMo* system, by default all group members have the same vote weight, but it can be doubled or tripled for privileged group members. A drop-down list presents the selection for date and time.

Optional attributes are a pre-selection of cinemas and movies. A list of cinemas (with details on each cinema on demand) is generated automatically according to the current position. The agent can deselect cinemas to exclude. A list of movies is automatically populated through the selected cinemas and show time. The agent can also deselect movies that the group does not want. The agent then sends a request for movie recommendations.

In the *Decision Phase* the system merges the predictions to movie recommendations by maximising the minimal frustra-

tion among the group members. It presents the top recommendation along with short explanations. On demand, alternative group recommendations can be obtained.

The final *Action Phase* is where the group either finds an agreement or dissolves. Later, the individual group members can rate the watched movie.

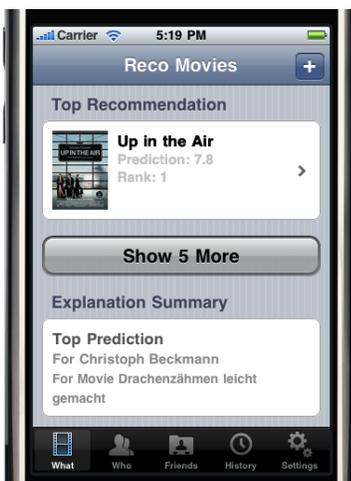


Figure 2. *AGReMo* app.

### 4. IMPLEMENTATION

The *AGReMo* implementation bases on a distributed software architecture. The *AGReMo* app is as a mobile *GroupRecoMobileClient*. The *GroupRecoServer* system is responsible for generating group recommendations. The *SingleUserRecoService* encapsulates an existing single-user system.

### 5. CONCLUSIONS

We introduced a process model for group recommendations and its application in the *AGReMo* system. The capabilities of the process model as well as the user interaction with the mobile system are currently investigated in a group study. Future work should consider its findings and extend the mobile approach supporting multiple agents per group.

### Acknowledgements

We thank the members of the CML (esp. Maximilian Schirmer), and moviepilot. Part of the work has been funded by the German Research Foundation (DFG GR 2055/2-1).

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