

VIZREC: A TWO-STAGE RECOMMENDER SYSTEM FOR PERSONALIZED VISUALIZATIONS



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RESEARCH QUESTION

Shall visualizations be recommended in a personalized manner?

CONTRIBUTIONS

For dealing with an overloaded information space, we propose *VizRec*, a novel approach combining recommender systems (RS) and visualizations. Our contributions are:

- a novel visual recommender approach to generating and recommending personalized visualizations according to user preferences,
- a crowd-based experiment employing Amazon Mechanical Turk to collect user preferences showing the usefulness of the approach.

EXPERIMENT

We conducted a crowd-based experiment using Amazon Mechanical Turk to obtain user preferences. The experiment setup was the following:

- MovieLens dataset as input data,
- 55 mapping combinations for the input data: 32 bar-charts, 9 line-charts, 13 timelines and 1 geo-chart,
- 19 HITs, each evaluated by 10 users in terms of quality of the suggested visualizations along 9 usability factors,
- the rating scale: between 1 (not applicable) and 7 (very applicable).

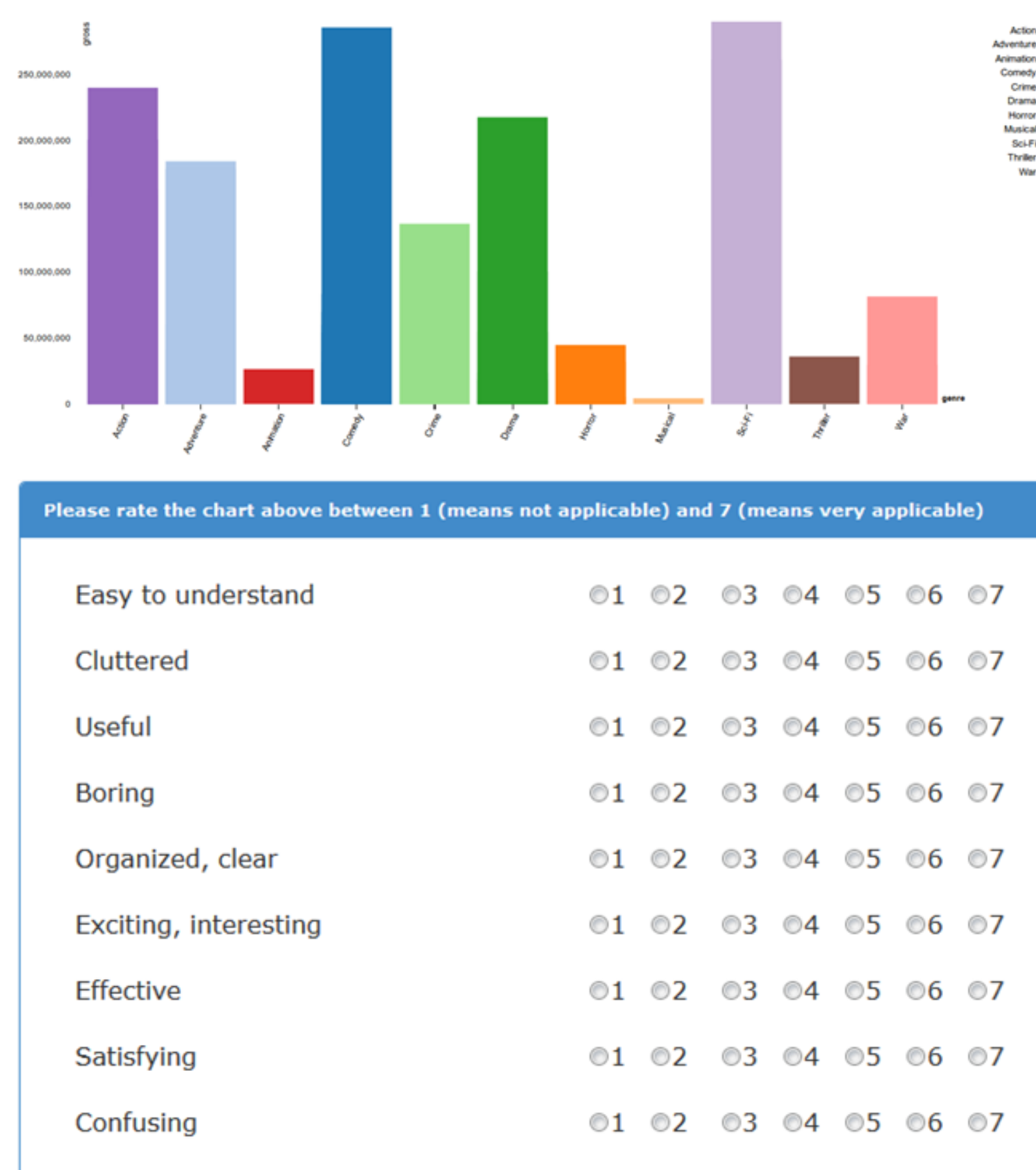


Fig. 1: Example of a HIT (Human Intelligence Task)

APPROACH

VizRec (i) automatically identifies a set of appropriate visualizations using a rule-based algorithm, (ii) filters a subset of the appropriate visualizations based on the users preferences and (iii) displays them to the user in a personalized manner.

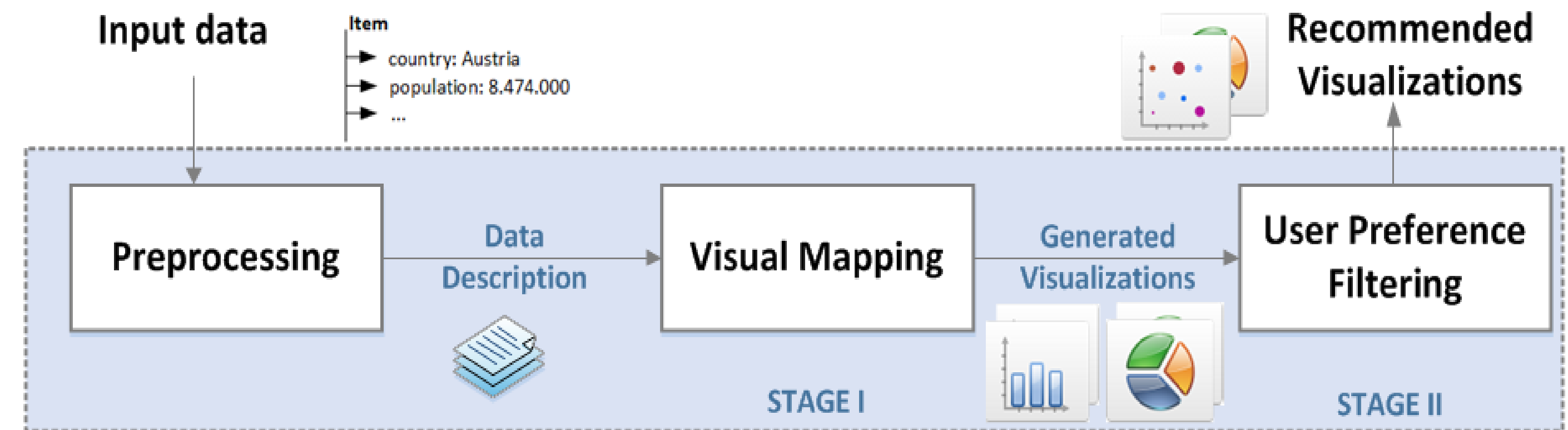


Fig. 2: *VizRec* workflow for recommending personalized visualizations

RESULTS

User Preferences:

- a total of 550 ratings were collected,
- from 36 expert workers in Amazon Mechanical Turk.

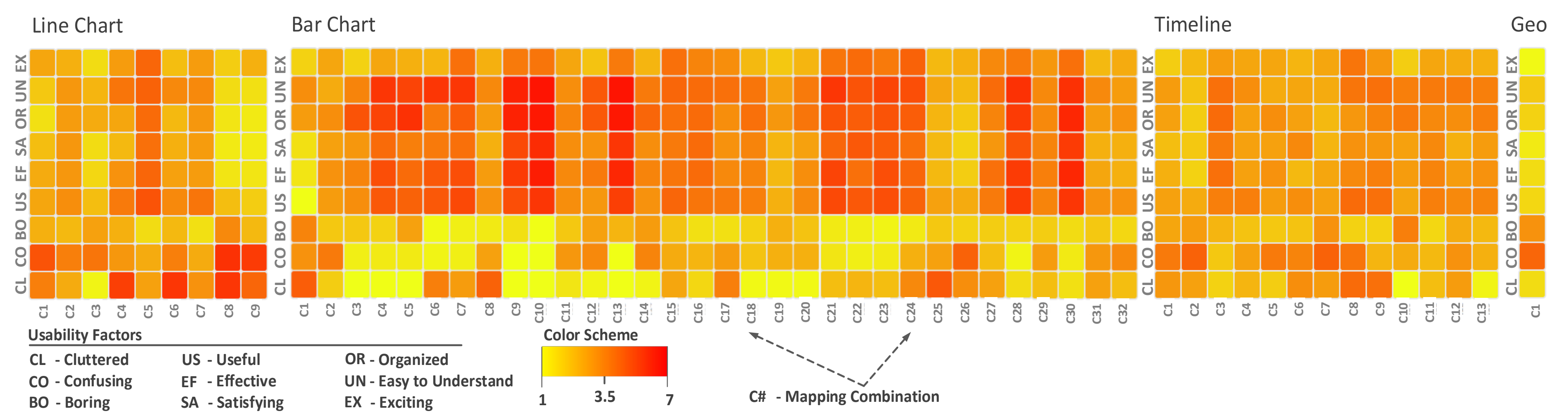


Fig. 3: Average of explicit ratings for 9 usability factors

Visual Recommendations:

- a subset of appropriate visualizations selected according to user preferences,
- recommendations presented in a top-n sorted manner,
- user feedback given in the form of ratings to update the user preferences.

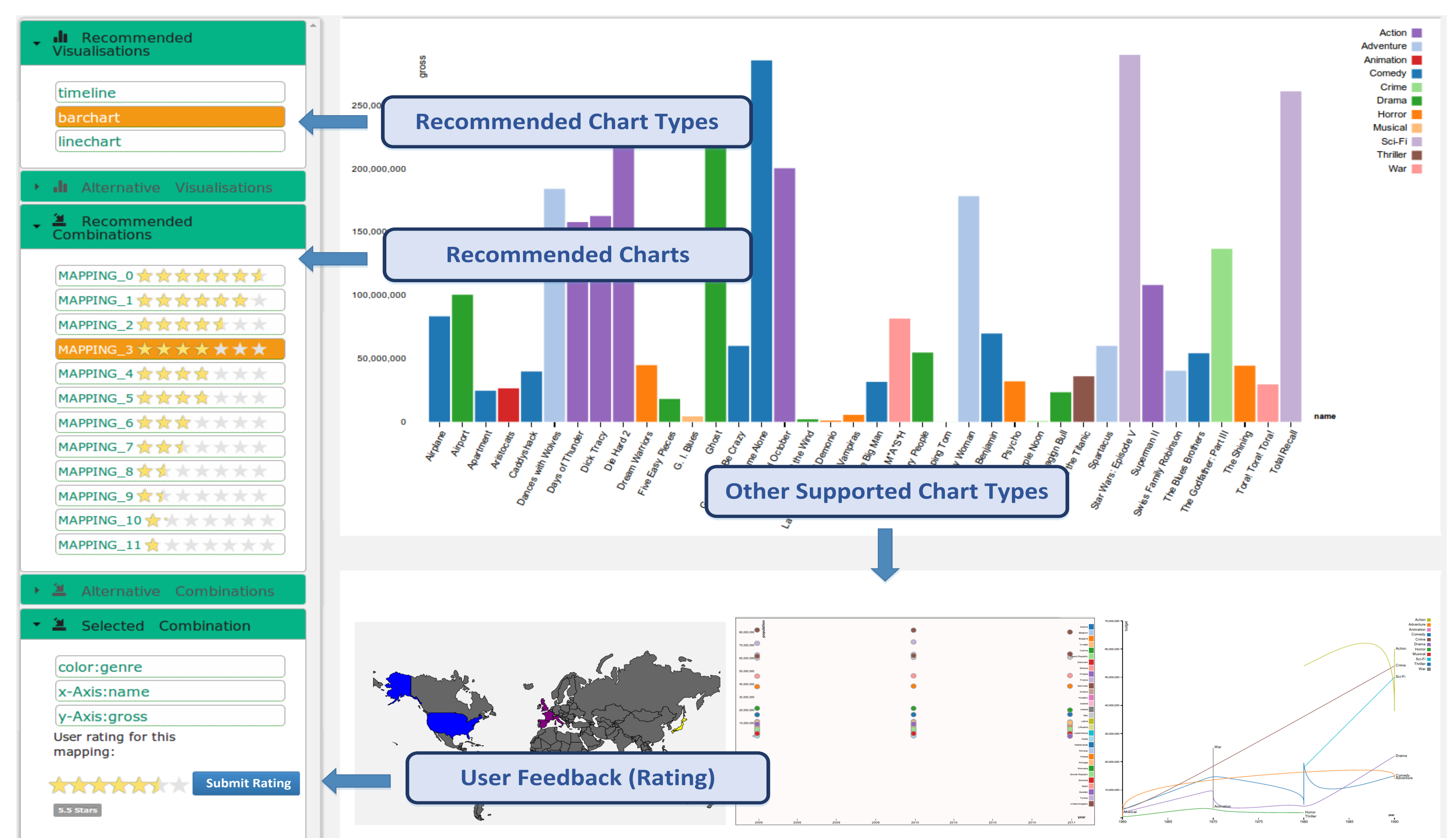


Fig. 4: Example of a visualization recommendation

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