

# Experimental Design Report

## Objective

To assess the impact of community-based recommendations on movie rental behavior.

## Hypothesis

Community-based recommendations will lead to an increase in movie rentals compared to individual-based recommendations.

## Experiment Design

**Participants Selection:** Randomly select a group of users from the existing user base. Ensure a diverse mix in terms of demographics, movie preferences, and rental history.

**Group Division:** Divide the participants into two groups: Control Group (CG): Receives individual-based recommendations. Experimental Group (EG): Receives community-based recommendations.

**Community Formation (for EG):** Form communities based on similar interests, demographic factors, or past rental behaviors. Utilize clustering algorithms or social network analysis to identify potential community groupings.

**Recommendation Engine Adjustment:** For the CG, continue with the standard recommendation algorithm. For the EG, modify the recommendation algorithm to include community preferences.

**Duration:** Run the experiment for a sufficient period, say 3-6 months, to allow for meaningful data collection.

**Data Collection:** Track movie rental data for both groups. Collect qualitative feedback through surveys or interviews, focusing on user satisfaction and engagement.

## Evaluation Metrics:

**Rental Frequency:** Compare the number of movies rented per user in the EG versus the CG.

**Rental Diversity:** Assess the diversity of genres or movie types rented within each group.

**User Engagement:** Measure the frequency of app or website usage. Analyze time spent on the platform and interaction with recommendation features.

**Customer Satisfaction:** Utilize surveys to gauge user satisfaction with the recommendations. Include Net Promoter Score (NPS) as a metric.

**Community Interaction (for EG):** Measure the level of interaction within communities (e.g., discussions, ratings). Assess the influence of community interactions on rental decisions.

**Retention Rate:** Track the retention rate of users in both groups.

**Conversion Rate:** Measure the rate at which movie rentals lead to purchases (if applicable).

**Cost Analysis:** Evaluate the cost-effectiveness of implementing community-based recommendations.