

# Chapter 13

## Narrative Threads and Cinematic Connections Using Intelligent Systems to Enhance Movie Recommendations with Market Basket Analysis and Advanced Algorithms

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### ABSTRACT

*Movie streaming services are businesses driven by data and strategies to predict future viewing patterns based on historical data. Without unsupervised learning techniques, industries like movie streaming services might face laborious tasks and issues in anticipating customer preferences and forecasting changes in customer behavior. In this chapter, market basket analysis (MBA) and recommender systems were implemented on MovieLens Data. In MBA, movie watching patterns were identified using two types of rule-generating algorithms, namely the apriori algorithm and the FP-growth algorithm. Three visualization idioms were generated to understand the association rules extracted in the MBA. Secondly, five types of recommender systems, namely memory-based collaborative filtering, model-based collaborative filtering, content filtering, context filtering, and the hybrid method, were implemented to suggest relevant movies to customers. Each recommender system was experimented with three different TopN configurations, and the results were evaluated using information retrieval metrics.*

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## **1. INTRODUCTION**

In an age where storytelling transcends traditional mediums, the intersection of narrative theory and digital innovation opens up new avenues for understanding and enhancing viewer engagement in the cinematic landscape. In the competitive landscape of movie streaming services, providers are striving to enhance the viewing experience and cater to the varied preferences of their audience to maintain user engagement within their platforms. This endeavor requires service providers to deliver an exceptional user experience, suggest content that aligns with user interests, and, ideally, anticipate the movies users might choose to watch next. Providers unable to meet these expectations risk facing increased customer churn, diminished service ratings, or a decline in customer lifetime value (CLV). A crucial strategy for enriching the user experience involves analyzing individual users' past ratings patterns. This analysis allows providers to recommend movies similar to those a user has previously enjoyed.

Moreover, recognizing that some viewers prefer binge-watching, accurately predicting subsequent movie choices becomes essential. Providers must delve into users' viewing histories to uncover potential patterns of association between watched titles. For instance, discovering that viewers of "Avengers: Age of Ultron" are likely to watch "Avengers: Infinity War" next enables providers to make precise recommendations. Such targeted suggestions not only enhance content relevance but also significantly boost overall user satisfaction.

Therefore, this research will address two problems. First, it aims to predict the "rating" a user would assign to a movie or its attribute based on users' rating histories, thereby suggesting relevant items. To achieve this objective, the study will construct and evaluate three types of recommender systems: Collaborative Filtering System, Content-based System, and Hybrid (Keikhosrokiani, 2022; Keikhosrokiani & Fye, 2023; Low et al., 2024; Xian et al., 2022; Zhao & Keikhosrokiani, 2022). Second, the research intends to use users' rating histories to identify association rules among movies to determine which movies users are likely to watch next. The difference between recommender systems and Market Basket Analysis (MBA) lies in their scope; MBA represents the buying patterns of the entire population, whereas recommender systems focus on specific users or items. Recommender systems answer the question "What are the movies that users with interests similar to yours like?" On the other hand, association rules tackle the question, "What are the movies that frequently watched together (Timur, 2020)?"

By implementing the two algorithms described, this chapter aims to develop a reliable movie recommendation system that enhances the user experience. As a result, movie service providers are likely to gain popularity by accurately recommending movies, leading to an increase in both user retention rates and service ratings.

## **2. BACKGROUND**

### **2.1 Domain Background**

Originating as a product of 19th-century scientific exploration, cinematography has transformed into the leading form of entertainment media, now commanding a multi-billion-pound industry. The evolution of the movie industry over more than a century encompasses a journey from the early days of black and white silent films to the advent of sound in the 1920s, the introduction of color in the 1930s, and the rise of mainstream 3D movies in recent times. According to Grand View Research, (*Movies And*

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