Using AI to Optimize Movie Title Stock at Thousands of Locations

Predicting what customers in various locations will want to watch is a job for artificial intelligence and machine learning.

Optimizing Product Assortment on a Hyperlocal Level

This DVD rental company's kiosks are a common sight in supermarkets and other retail locations throughout North America. As a leader in self-service DVD rental, they need to stay tuned into local variations of taste and movie demand. And as one of their key selling points is their weekly new releases, they needed to be able to make decisions about which movies to buy and stock quickly.

To do this (and still manage their budget), our client needed to choose the correct mix of titles (including quantities per title and DVD/Blu-Ray format) for each kiosk, prioritizing these decisions for maximum revenue impact. Also, they needed data-backed guidance on how many units of each new title to purchase.

Adding AI and ML to a Rich Data Pool

Optimizing product assortments for each location required us to aggregate multiple data sources. At one level, these could be broken down into transaction data, kiosk data, and title data. But a closer look revealed just how rich and varied this data pool was. In reality, we needed to process:

- Kiosk behavior for each location
- Average cost per title
- Average cost per DVD/Blu-Ray disc
- Average profit amounts per title and kiosk
- Historical rental patterns
- Stock-outs
- Time and volume of transaction
- Member demographics
- Web/app activity (i.e. renting movies via app or website)

To forecast how new movie titles would perform in a given location, we added third-party data (i.e. reviews, customer sentiment) to the mix. We also used historical data from similar movie titles to predict how each location would respond to a given new title.

Over a four-week period, advanced AI and ML techniques (specifically, Gradient Boosted Machines, Random Forests, and K Nearest Neighbors) were applied to the above data. The client was able to drill down to the title level and see the suggested assortment for each kiosk – not just which titles to stock, but how many to stock and how to split stock between DVD and Blu-Ray formats.

From Guesswork to Data-Driven Assortment

With ML-based predictive analytics, much of the guess-work has been removed from this rental company's per-kiosk assortments. By comparing how similar titles have fared in the past, they can predict which new releases will do well in each location. And by employing AI-assisted number crunching, they can quickly see the most profitable choices for DVD and Blu-Ray purchase.