Business Evaluation Report: Profitability of the Movie Recommendation Engine

Overview

This report evaluates the profitability of the movie recommendation engine, considering the specific business context of a movie rental and purchase service. Key factors include rental and purchase fees, membership costs, storage expenses, and the cost of generating recommendations.

Business Context and Financials

Movie Rental Fee: $5

Movie Purchase Fee: $12

Monthly Membership: $20

Storage Cost for Uncompressed Movie: $0.75/day

Cost of Movie Recommendation: $0.01/recommended movie

Constraints: Rental expiration (72 hours), viewing window (24 hours post-start), compression of unwatched purchased movies after 15 days.

Profitability Analysis

1. **Increased Rentals and Purchases**:The recommendation engine aims to enhance user engagement by suggesting relevant titles, potentially leading to more frequent rentals and purchases.
Impact: Increased transactions directly contribute to revenue. For instance, if the engine leads to 1000 additional rentals monthly, revenue increases by $5000.
2. **Membership Growth**: A superior recommendation system can attract new subscribers and retain existing ones.
    Impact: Assuming a 5% increase in membership due to improved user experience, this translates to additional monthly revenue.
3. **Storage Cost Optimization**: Efficient recommendations may reduce the duration movies are stored uncompressed, by promoting timely viewing.
    Impact: Savings in storage costs, enhancing overall profitability.
4. **Recommendation Costs**: Each recommendation incurs a cost of $0.01.
    Impact: While this is a nominal amount, high volumes of recommendations can accumulate significant costs.

Cost-Benefit Analysis

Revenue Increase: Estimate the additional
    revenue from increased rentals, purchases, and memberships attributable to
    the recommendation engine.

Cost Savings: Calculate the reduction in
    storage costs due to optimized movie consumption patterns.

Recommendation Costs: Total expenditure on generating movie recommendations.

Break-Even Analysis

Determine the point at which the revenue from increased transactions and memberships offsets the costs of recommendations and storage.

To conduct a cost-benefit analysis and approximate the break-even point for the movie recommendation engine, let's make some assumptions based on the provided numbers. This analysis will be a simplified model to give an idea of how the recommendation system might impact profitability.

Assumptions:
Current User Base: 10,000 active users.
Increase in Transactions Due to Recommendations:
Rentals: 10% increase.
Purchases: 5% increase.
Increase in Membership: 5% increase in membership due to improved user experience.
Average Number of Recommendations per User per Month: 30.
Current Revenue (without Recommendation Engine):
Rentals: Assuming an average of 1 rental per user per month, current rental revenue = 10,000 users × $5 × 1 = $50,000.
Purchases: Assuming an average of 0.5 purchases per user per month, current purchase revenue = 10,000 users × $12 × 0.5 = $60,000.
Membership: Total membership revenue = 10,000 users × $20 = $200,000.
Total Current Revenue: $50,000 (Rentals) + $60,000 (Purchases) + $200,000 (Memberships) = $310,000.
Additional Revenue (with Recommendation Engine):
Additional Rentals: 10% of $50,000 = $5,000.
Additional Purchases: 5% of $60,000 = $3,000.
Additional Memberships: 5% of 10,000 users = 500 new members; additional revenue = 500 × $20 = $10,000.
Total Additional Revenue: $5,000 (Rentals) + $3,000 (Purchases) + $10,000 (Memberships) = $18,000.
Costs:
Recommendation Costs: 30 recommendations × $0.01 × 10,000 users = $3,000 per month.
Storage Costs: Not directly impacted by recommendations, so we'll assume they remain constant.
Net Gain:
Total Net Gain: $18,000 (Additional Revenue) - $3,000 (Recommendation Costs) = $15,000.
Break-Even Analysis:
The system breaks even when the additional revenue offsets the costs of the recommendation engine.
In this case, the break-even point is immediately achieved, as the additional revenue ($18,000) exceeds the recommendation costs ($3,000).