Guided Capstone Project Report

Executive Summary

Our analysis indicates that Big Mountain Resort is currently underpriced at $81 for weekend tickets compared to resorts with similar facilities. The model suggests a market-aligned price of $95.87 is supportable, representing an opportunity for an 18% increase in revenue. We recommend a phased approach to price increases, starting with a move to $88-90 while monitoring market response.

Problem Statement

Big Mountain Resort needed to develop a pricing strategy and understand if they are maximizing their returns relative to their market position. The key questions were:

1. What should the optimal ticket price be?

2. Which resort facilities matter most to visitors and influence pricing?

3. How can future facility investments be prioritized?

A graph of a number of tickets

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Figure 1: Big Mountain's current weekend ticket price ($81) compared to market distribution

Data Wrangling & Quality

The analysis was based on a dataset of ski resorts with various features including:

- Ticket prices (weekend/weekday)

- Terrain characteristics

- Facility information

- Geographic location

Several data quality issues were addressed:

- Missing values were handled through imputation

- Outliers were identified and corrected (e.g., Silverton Mountain's skiable terrain area)

- Resort features were standardized for comparison

Exploratory Data Analysis

Key findings from the exploratory analysis:

1. Location Analysis:

- Montana ranks in top 5 states for total skiable area

- New York has most resorts but smaller average size

- Geographic location showed less impact on pricing than facility features

2. Resort Characteristics:

Big Mountain's position relative to competitors:

- Vertical Drop: 2,353 feet, placing it in the top 20% of resorts

- Skiable Terrain: 3,000 acres, in the top 10% of resorts

- Snow Making Coverage: Among the highest in the market

- Total Chairs: 11 chairs including 3 high-speed quads, near the top of the market

- Number of Runs: 105 runs, well above the market median

A screenshot of a computer screen

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Model Development

Feature Engineering

- Created derived metrics for resort density and facility utilization

- Standardized numerical features

- Developed combined facility quality indicators

Modeling Approach

1. Initial baseline using average price prediction

2. Linear Regression model with feature selection

3. Random Forest model for complex feature interactions

Evaluation Metrics

- R-squared score for model fit assessment

- Mean Absolute Error for price prediction accuracy

- Cross-validation to ensure model robustness

Model Results & Pricing Recommendations

Current Position Analysis

- Current weekend ticket price: $81

- Model-supported price: $95.87

- Potential revenue increase: ~18%

- Model confidence: Mean Absolute Error of $10.39

A graph of a graph showing a graph

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Scenario Analysis Results

We modeled four potential business scenarios:

1. Run Closure Scenario

- Closing 1-3 runs: Minimal impact on ticket price

- Closing 4-5 runs: No additional impact

- Closing 6+ runs: Significant negative impact on pricing power

A graph of a line with a line in the middle

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2. Vertical Drop Extension

- Adding 150 feet vertical drop + 1 chair lift

- Price support increase: $1.99

- Potential additional annual revenue: $3.47M

3. Enhanced Snow Making

- Scenario 2 + 2 acres snow making

- No additional price support beyond Scenario 2

4. Extended Run Length

- 0.2 mile longer run + 4 acres snow making

- Minimal impact on supported price

Pricing Recommendations

1. Immediate Term

- Implement phased price increase:

- Phase 1: Increase to $88-90

- Phase 2: Move toward $95 based on market response

2. Strategic Considerations

- Monitor customer satisfaction and visit frequency

- Track competitor responses

- Consider dynamic pricing for peak periods

- Evaluate season pass pricing structure

Future Investment Recommendations

Priority areas for facility investment:

1. Snow making infrastructure

2. Lift capacity improvements

3. Terrain expansion where feasible

Future Work

Further analysis could include:

1. Seasonal demand patterns

2. Customer segment analysis

3. Dynamic pricing models

4. Competition-specific analysis

5. Cost-benefit analysis of recommended improvements

Conclusion

Big Mountain Resort has strong market positioning with room for price optimization. The data suggests potential for revenue growth through strategic pricing and targeted facility improvements. Implementation of recommendations should be phased and monitored for market response.