Big Mountain Resort

Opportunities to optimize ticket prices
& investment strategy

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Problem Identification

Company

Big Mountain Resort is a ski resort based in Montana
- Spectacular views of Glacier National Park & Flathead National Forest
- 105 Trails
- Summit at 6817 ft
- Vertical drop of 2353 ft
- Longest run of 3.3 miles
- 350,000 visitors annually

Context

- Ticket pricing model is very basic, based on premium over average market price.
- Not fully capitalizing on the facilities offered
- Lack of understanding of how different facilities impact ticket pricing
- Need to implement a more data-driven investment strategy

Problem statement

What opportunities exist for Big Mountain Resorts to increase ticket prices and reduce operational costs to
- Improve its revenue growth rate by 10%*
- Reduce operational costs by 15%* this year

*as compared to the trend over last 3 financial years.

Problem Identification

Success Criteria

A scientific ticket price model that is
- Based on resort features
- Explains which features have most impact on pricing
- Can be applied easily by business teams to make pricing, investment and operational decisions

Scope of Solution

Ticket pricing model will be based on features data available for 330 resorts in the same market segment.

The scope will not include other factors that impact pricing & costs e.g. Brand Equity, Ad spend, strategic partnership with travel companies, fixed over heads, interest costs etc.

Constraints

The following factors would limit business outcomes:
- Pre-existing ticket deals/packages that are medium/long-term in nature.
- Business disruptions from weather, other external factors.
- Any binding medium/long-term equipment leasing or maintenance contracts.

Key Findings – Ticket Prices

- Ticket Prices of ski resorts range from $17 to $179, with a average price of **$64.00**
- BMR's superior facilities have a potential market value of **$96.00, 18.5%** higher than the current $81.00 tag
- Ticket price model has an error value of $10.0 approx., so BMR has a **min. $86.00** value
- 8 features have highest impact on ticket pricing

    - Vertical Drop:
    - Snow making acreage:
    - Total Chairs:
    - Fast Quads:
    - Total runs:
    - Longest Run:
    - Trams:
    - Total Skiable Terrain:

- BMR performs exceedingly well on all 8 – with an average score of **94.6 percentile** i.e. its features are better than 94.6% of the resorts
- Current price of $81.00 is at **81 percentile** of the market, so there is headroom to increase ticket prices

Key Findings − Feature Changes

Closure of 10 least used runs
- Reducing runs impacts value, ranging from $0.41 (2 runs) to $1.81 per ticket for 10 runs
- Reducing 3 to 5 runs has the same impact at $0.67 per ticket
- Model cannot differentiate between more popular and less popular runs
- Closure of less popular runs may not have as much value impact as predicted by the model

Increasing vertical drop by 150 feet and installing an additional chair lift
- This change improves value by $1.99 per ticket
- Potential revenue increase of **$3.47 million**, vs $1.54 million incremental costs

Repeating 2, but adding 2 acres of snow making
- No impact on ticket value, the increase in snow making area is too small

Increase the longest run by 0.2 miles:
- No impact on ticket value, the increase is marginal

Recommendations

Ticket Prices
- There is potential to increase ticket price by $5.00 to $10.00
- However, demand-supply relationship at different ticket prices should be understood and established before any price changes.

Feature Changes
- Less popular runs can be closed in 2 to 3 phases, to minimize any impact on value perception
- In phase 1, 3 to 5 least popular runs can be closed
- Basis learnings from phase 1, further runs can be closed
- Vertical drop increase of 150 feet is monetizable at $1.99 per ticket, so should be taken with a corresponding price increase
- Increase of 2 acres in snow making area and 0.2 miles in longest run are not large enough to monetize

Modelling Results and Analysis

Model Generation – A quick walkthrough

Data from **330 resorts**
- 25 features
- Ticket pricing for Weekday & Weekend

Data on state population & area added to study potential impact on pricing

*Source: Wikipedia

Model applied to study cost-benefit of various investment options & operational choices

| Raw Data | Cleaned Data | Additional Data | Modelling | Application & Results |

- Multiple checks for consistency
- Resorts with both ticket prices missing removed
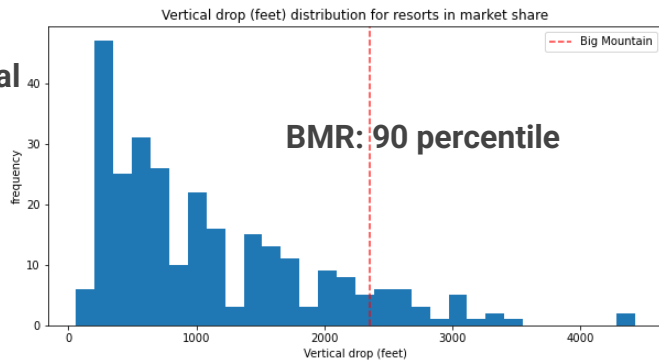- Final dataset on **277 resorts** taken to modelling stage

- Multiple Linear regression & Random Forest models generated
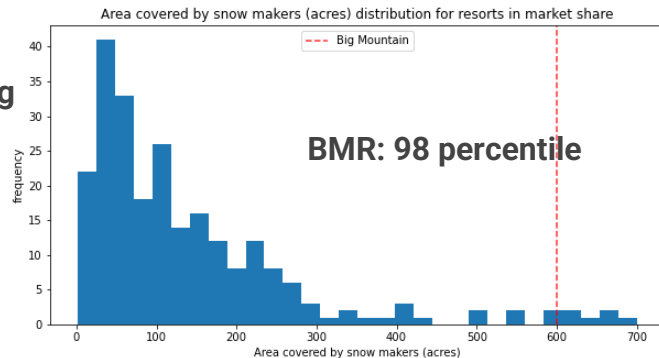- Each model evaluated for its predictive accuracy
- Selected Model: Random Forest

Analysis & Insights

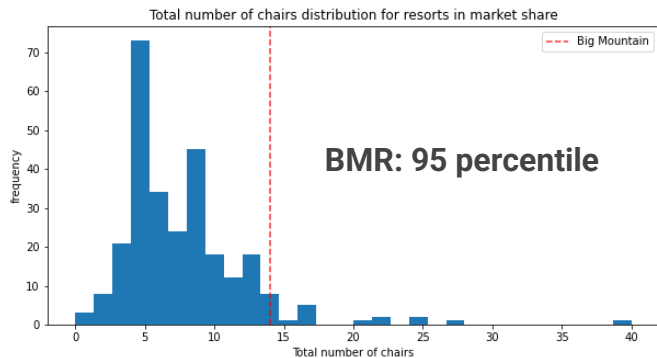- 8 features have most impact on pricing, BMR performs at **90+ percentile** across all these
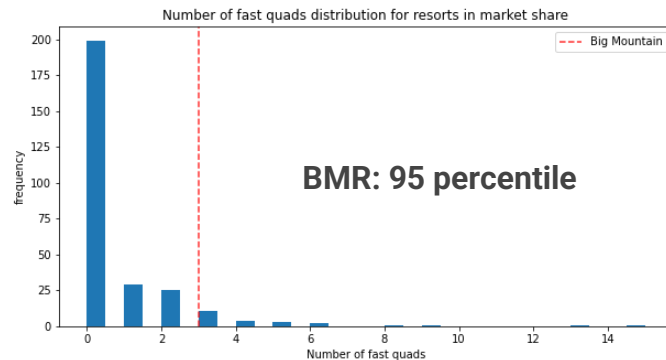

1. Vertical Drop — Vertical drop (feet) distribution for resorts in market share — BMR: 90 percentile

2. Snow making acreage — Area covered by snow makers (acres) distribution for resorts in market share — BMR: 98 percentile

3. Total Chairs — Total number of chairs distribution for resorts in market share — BMR: 95 percentile

4. Fast Quads — Number of fast quads distribution for resorts in market share — BMR: 95 percentile

Analysis & Insights

5. Total runs

Total number of runs distribution for resorts in market share

BMR: 93 percentile

6. Longest Run

Longest run length (miles) distribution for resorts in market share

BMR: 96 percentile

7. Trams

Number of trams distribution for resorts in market share

BMR: 92 percentile

8. Total Skiable Terrain

Skiable terrain area (acres) distribution for resorts in market share

BMR: 98 percentile
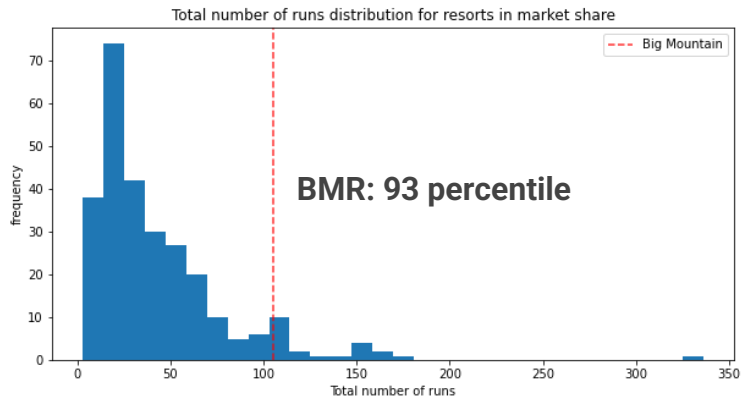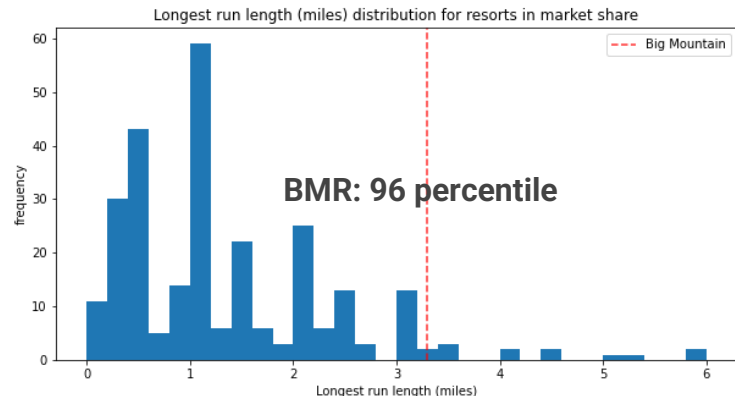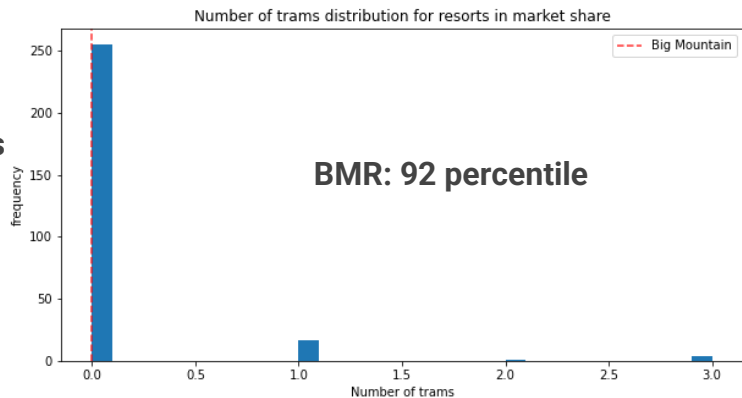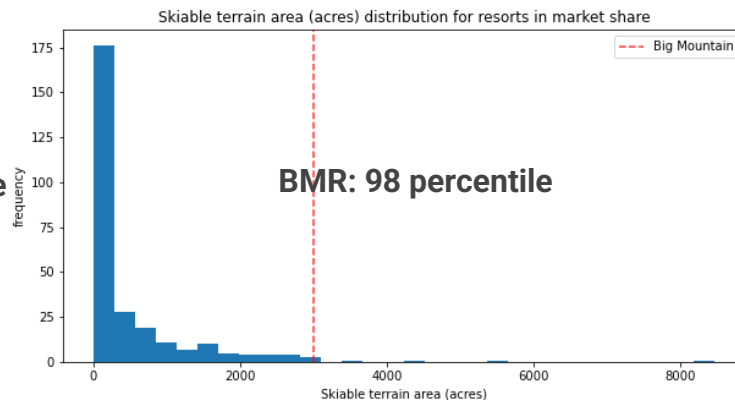
Summary & Conclusion

Summary & Conclusion

- The model's projected price for BMR is $96.00, at **92.4** percentile of the market

- This intuitively seems correct, as BMR's performs at an average of **94.6** percentile on top 8 features. As such, the model has strong business relevance.

- A demand-supply model to understand price sensitivity of demand needs to be built to ensure that any price increase improves revenue.

- The ticket price models could be further refined in future by adding parameters such as:

  - Popularity of skiing in a certain state/region: This could be derived by the total no. of visitors to all resorts in a state and be an important input to understanding demand-supply dynamics.

  - The Demand-supply dynamics of a resort and the state: As against total demand, what is the capacity of a resort ? Is it running at full/partial capacity ? What capacity are other resorts running in the state?

  - Ratings and reviews of resorts by travel sites/influencers/visitors: Pricing can be influenced by ratings and reviews that are available online.