BUSINESS INTELLIGENCE CASE STUDY:

FLYINGWHALE AIRLINE

POWER BI PORTFOLIO PROJECT

ABSTRACT

Flying Whale Airline, a prominent (fictional) international airline, is seeking to enhance its business intelligence capabilities by analyzing Customer Flight Activity and Customer Loyalty History. The airline is committed to optimizing customer experience, understanding travel patterns, and maximizing the effectiveness of its loyalty programs. Henceforth, Team Triple A analytical services were rendered to come up with a comprehensive dashboard.

TEAM TRIPLE A

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Table of Contents

**Business Intelligence Case Study: Flying Whale Airline: Power BI Portfolio Project**

Here are the cleaning and transformation steps in Power Query that have been performed:

ETL Steps Performed

1. **Loaded Data**:
   - Imported **Customer Flight Activity** and **Customer Loyalty History** as CSV/Text files.
2. **Data Transformation**:
   - Checked for errors in the data.
     - Identified and handled Null values in the **Salary** column.
     - Addressed any issues with the **Cancellation Year/Month**.
3. **Close & Apply**:
   - Saved changes and applied the transformations to the model.
4. **Dimension and Fact Tables**:
   - Designated **Customer Loyalty History** as a Dimension Table (Qualitative/Textual Data).
   - Designated **Customer Flight Activity** as a Fact Table (Numeric/Quantitative Data).
5. **Month Formatting**:
   - Ensured that month names are formatted correctly.
   - Ensured proper sorting of months.
     - Corrected the sorting issue where month "3" appeared before month "1".
     - Created a new column for month names using the formula:
       FORMAT(DATE(2000, [Month], 1), "MMMM")

This outlines the transformations and checks applied to the data in Power Query.

Entity Relationship Diagram (ERD)
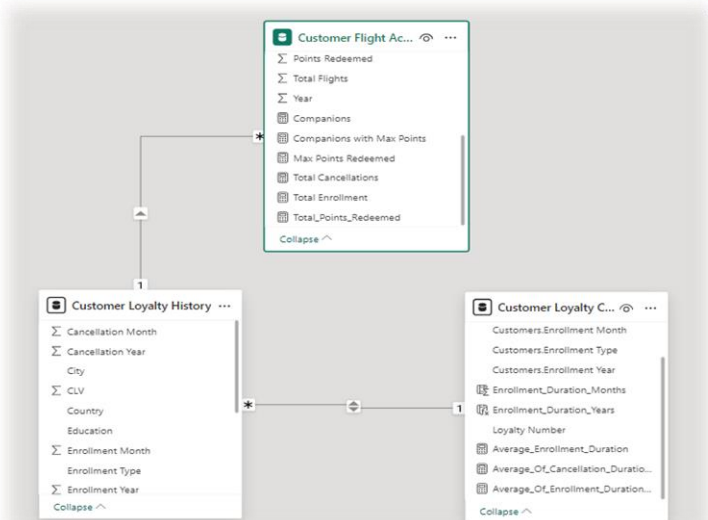
The ERD in the Modelling view was based on the Star Schema.

Overview

The Flight Activity Analysis section analyzes the monthly and yearly flight booking patterns to identify trends in customer travel behavior.

Total Flight Bookings by Month

According to the data presented in the table and bar chart in Power BI, **July** consistently records the highest number of flight bookings, totaling **193,431** bookings. Following July, the months with significant bookings include **June**, **August**, and **December**.

Analysis

This trend can likely be attributed to seasonal travel patterns, particularly during summer and winter vacations when families are more inclined to travel. In contrast, the months of **January** and **February** exhibit the lowest booking numbers. This decrease may be due to the post-holiday period and the start of the New Year, when professionals typically limit travel to business-related purposes.

Month	Total Flight Bookings
1	96936
2	96334
3	131199
4	112511
5	142170
6	173242
7	193431
8	169204
9	136379
10	129461
11	122250
12	166047
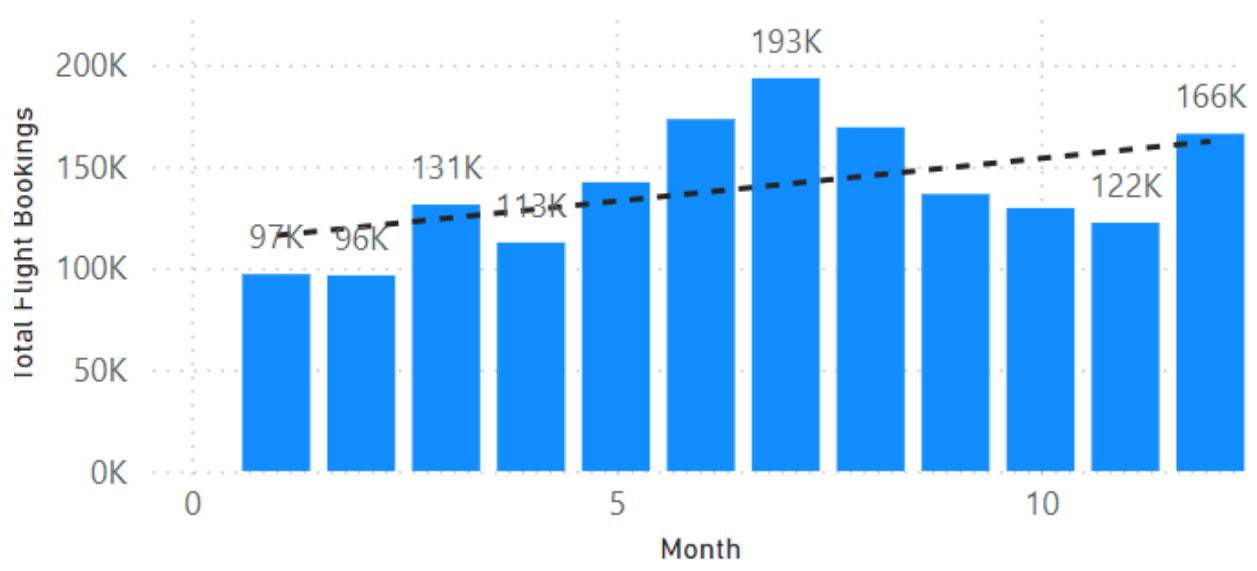
Total Flights bookings by Year

As per the table and graph below 2018 clearly has a higher number of flight bookings i.e. 881,754 as compared to 787,410 bookings in 2017. This could be due to the promo launched in 2018.

Year	Total Flights Booked
2017	787410
2018	881754
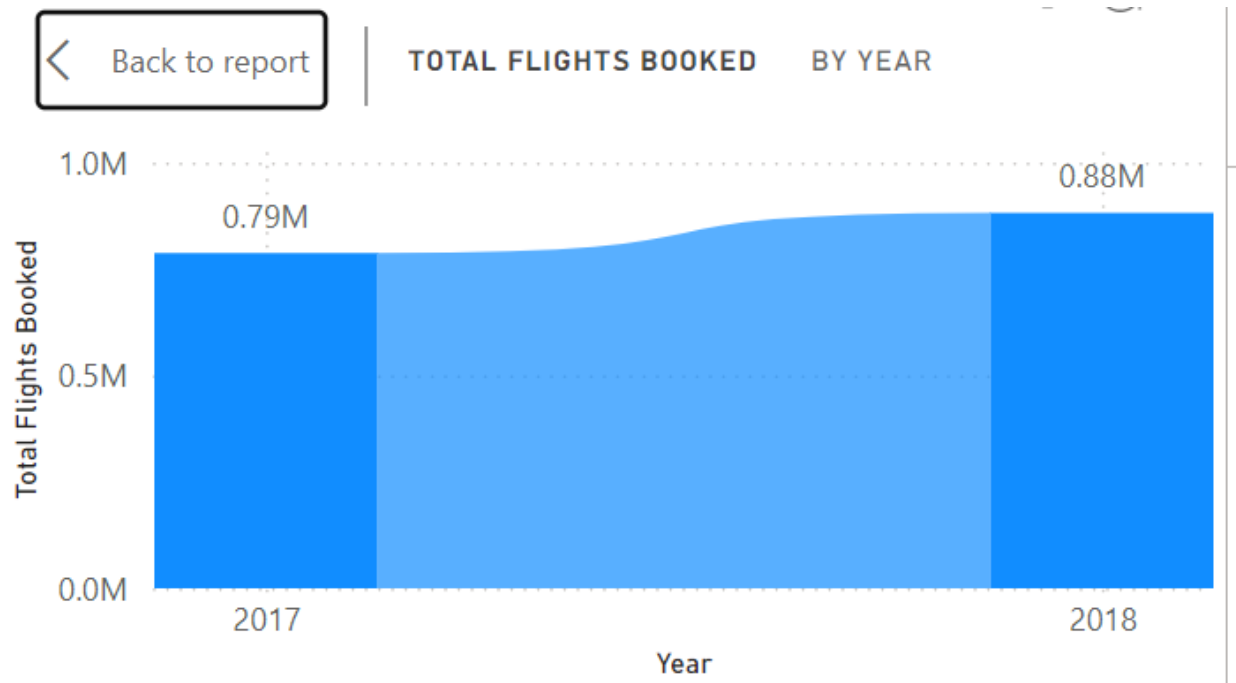
Conclusion

The analysis highlights distinct seasonal trends in flight bookings, emphasizing the importance of planning for peak travel periods. Understanding these patterns can help airlines tailor their services to meet customer demands effectively.

Correlation Analysis between Flight Distances and Loyalty Points Accumulated

This section explores the relationship between flight distances and the loyalty points accumulated by customers, utilizing statistical analysis to identify trends.

Key Findings
The analysis, as summarized in the accompanying table and visualizations, supports the hypothesis of a positive correlation between flight distances and loyalty points earned. Specifically, it appears that as the distance traveled increases, the loyalty points accumulated also tend to rise.

Analysis Details
- The trend line indicates a consistent relationship, while the max line illustrates that the longest distance traveled was **2,880 miles**, corresponding to **108,632.16 loyalty points** accrued.

- Notably, there are instances where only slight increases in distance do not correlate with a proportional increase in loyalty points. This may be due to points being either not accumulated or redeemed.

The Influencers visual reinforces this observation, demonstrating that for every increase of **1,417.60 miles** in total distance, the average loyalty points accumulated rises by **143.2 points**. This further substantiates the positive relationship between the two variables.

Conclusion

The findings indicate a significant correlation between flight distances and loyalty points, although exceptions exist. Understanding this relationship can aid airlines in designing loyalty programs that effectively reward frequent travelers based on distance traveled.

Distance	Sum of Points Accumulated
0	0.00
92	18.00
117	22.00
142	14.00
170	121.72
196	243.77
231	289.34
233	46.00

‹ Back to report | **SUM OF POINTS ACCUMULATED** BY DISTANCE
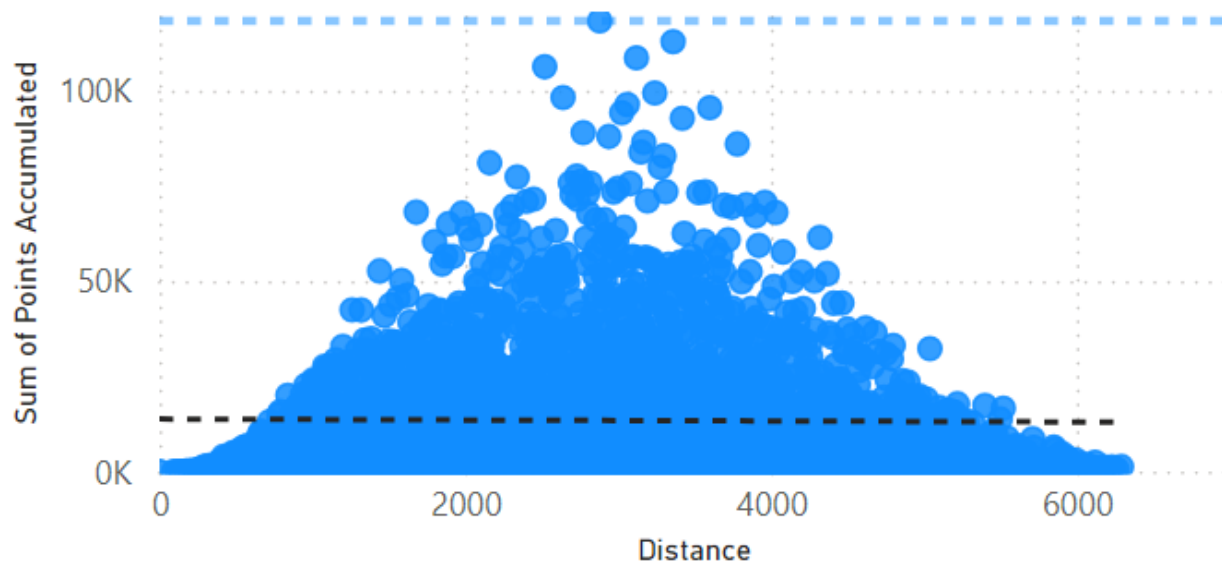
Flights with Companions	Total Points Redeemed
0	198967
1	1903942
2	2076362
3	2195087
4	1562536
5	1558007
6	1083407
7	823340

Impact Assessment of Companion Bookings on Loyalty Points Redeemed

This section evaluates the influence of companion bookings on the loyalty points redeemed by members, analyzing trends and highlighting key findings.

Key Findings
The analysis of the data presented in the tables reveals significant differences in loyalty points redeemed between flights booked solely by members and those booked with companions.

Points Redeemed

- When members booked flights exclusively for themselves throughout the period, the highest points redeemed totaled **1,098,546**.

- In contrast, the data for flights booked with companions indicates that the majority of these bookings resulted in higher points redeemed, with the peak redemption amount reaching **2,195,087** points.

Companion Analysis

- The analysis identifies that the highest number of companions associated with the maximum points redeemed is **4,384**. This corresponds to **Flight 3**, where members redeemed a total of **2,195,087 points**.

Conclusion

The findings clearly demonstrate that companion bookings significantly enhance the loyalty points redeemed by members. This insight can be valuable for airlines in crafting marketing strategies and loyalty programs that encourage companion travel, ultimately benefiting both the members and the airline.

Flights Booked	Total Points Redeemed
0	0
1	715388
2	763878
3	1098546
4	811206
5	955830
6	844208
7	868264

TOTAL POINTS REDEEMED   BY FLIGHTS WITH COMPANIONS
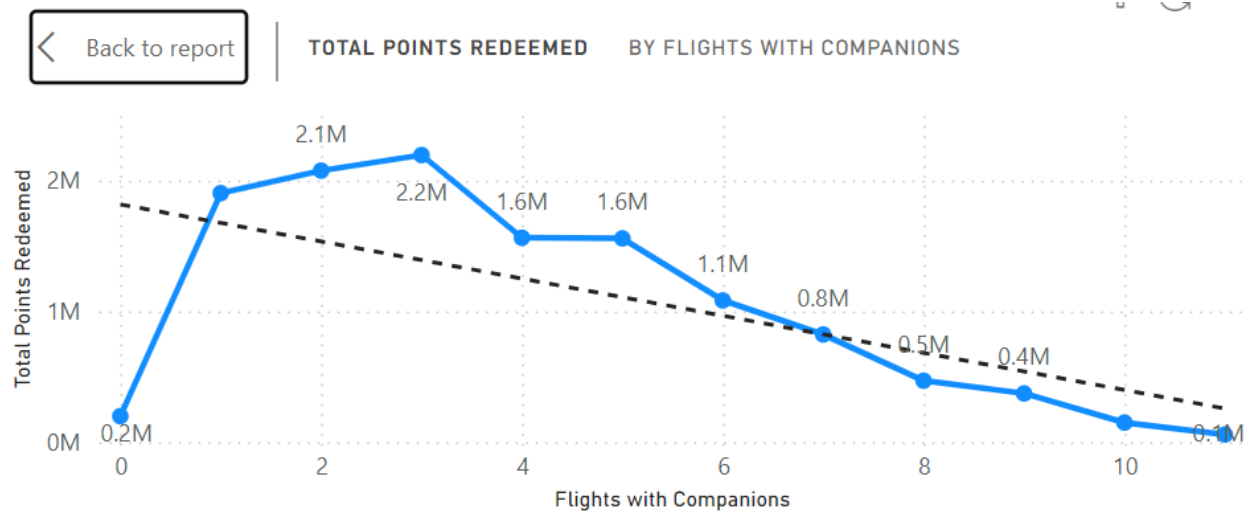
This part of the report segments customers based on their loyalty card status and analyzes various demographic and behavioral factors influencing flight bookings and customer lifetime value (CLV).

Customer Segmentation Based on Loyalty Card

Loyalty Card	Customers
Aurora	3429
Nova	5671
Star	7637
Total	**16737**

Loyalty Card Segmentation

Total Flights by Loyalty Card: The data showcases the total number of flights booked across different loyalty cards over the months. The Star card seems to have the highest number of flights booked over the months with 950040 total flights. Then, the Nova card with 706167 total flights and lastly Star with 431,484 flights.

Back to report | TOTAL FLIGHTS BY LOYALTY CARD OVER THE MONTHS

| Loyalty Card	1	2	3	4	5	6	7	8	9	10	11	12	Total
Aurora	24701	24359	33233	28647	37044	44492	51307	43202	35983	33870	31163	43481	**431482**
Nova	40737	40094	54978	47282	60401	73784	81772	72349	57210	55389	51710	70461	**706167**
Star	54201	54396	74048	63349	80358	98700	112219	96912	78121	73565	69419	94752	**950040**
Total	**119639**	**118849**	**162259**	**139278**	**177803**	**216976**	**245298**	**212463**	**171314**	**162824**	**152292**	**208694**	**2087689**

Customer Demographics and Behaviors

1. **Loyalty Members by Marital Status**

The analysis indicates that the married demographic constitutes the largest group of loyalty members, totaling 9,735, which represents 58.16% of the total members. This is followed by single members at 4,484 and divorced members at 2,518.

Marital Status	Number of Loyalty Members
Divorced	2518
Married	9735
Single	4484
Total	**16737**

NUMBER OF LOYALTY MEMBERS BY MARITAL STATUS

2.52K (15.04%)

4.48K (26.79%)

9.74K (58.16%)
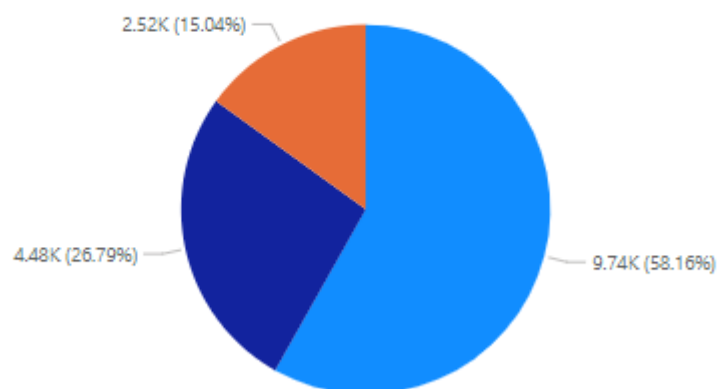
2. **Flights Booked by Loyalty Card and Gender**

The data shows a breakdown of flights booked by gender, highlighting the differences in booking patterns among loyalty cardholders. Relative utilization of the Aurora card was higher for Males than for females. For the Nova card Females seem to have utilized it more than males and for Star males seem to have a higher utilization/membership value.

Loyalty Card	Female	Male	**Total**
Aurora	171697	173347	**345044**
Nova	285720	279140	**564860**
Star	375581	383679	**759260**
Total	**832998**	**836166**	**1669164**

3. **Median Distance Traveled by Loyalty Card Tiers**

Loyalty Card Tiers	Median of Distance
Aurora	480
Nova	450
Star	519

The Star loyalty card tier has the highest median distance traveled at 519 miles, which is 15.33% greater than the Nova tier, which recorded the lowest median distance at 450 miles. Aurora tier travelers median distance traveled was 480 miles.

Customer Lifetime Value (CLV) Trends

The narrative visual generated insights indicating a total CLV of 133,710,161.32 across all months, with an average CLV of 44,570,053.77.

CLV by Loyalty Card Tier: The Aurora tier exhibits the highest total CLV, followed by Nova and then Star. However the loyalty members were highest for Star then for Nova and least for Aurora.

CLV by Marital Status: The married demographic again shows the highest CLV, accounting for 58.6%, followed by single customers, while divorced customers have the lowest CLV at 15.4%.

CLV by Gender: Females demonstrate a higher total CLV, totaling 67.13 million, compared to males.

Key Insights
The Aurora Loyalty credit card tier has customers with the highest average CLV, recorded at 10.67K across 3,429 customers. This can be validated by selecting the Aurora tier from the slicer in the loyalty segmentation report.

Loyalty Card	Customers	Average CLV
Aurora	3429	10,672.69
Nova	5671	8,045.62
Star	7637	6,741.76
Total	**16737**	**7,988.90**

Conclusion

The analysis illustrates distinct trends in customer demographics and behaviors across loyalty card segments, emphasizing the significant impact of marital status and gender on loyalty points and CLV. These insights can guide targeted marketing strategies to enhance customer engagement and loyalty program effectiveness.

Overview

This section analyzes the reasons and patterns behind membership cancellations among loyalty program participants, providing insights into enrollment duration and demographic influences on cancellation trends.

Enrollment and Cancellation Data

A new table titled **Customer Loyalty Cancellation** was created to track loyalty members who have canceled their memberships. This table includes:

- **Enrollment Duration** (e.g., 2 years 1 month)

- **Enrollment Duration (Months)** (e.g., 25 months)

Additionally, the **Customer Loyalty History** table was updated with:

- **Enrollment Duration (Till Date)**

- **Enrollment Duration (Till Date) Months**

These columns measure the time a member remained enrolled until cancellation or the present day.

Patterns of Membership Cancellations

By Education Level
- **Bachelors and College Students**: These groups exhibit the highest cancellation rates, likely due to limited travel needs and financial constraints.

- **Professionals (e.g., Doctors)**: Tend to retain memberships due to the necessity of travel for work and community service.

- **Masters Students**: Often maintain memberships to support their studies away from home.

- **High School or Less**: Typically lack the financial means and travel needs to justify membership.

By Marital Status
- **Married Individuals**: Experience the highest cancellation rates, possibly due to increased family responsibilities that limit travel.

- **Single Individuals**: Show the second highest cancellation trend, although they may retain memberships for work-related travel.

- **Divorced Individuals**: Exhibit the lowest cancellation rates, which may be attributed to fewer family obligations, allowing for more travel.

By Month

- **December**: Records the highest cancellations, likely due to members utilizing benefits during the holiday season and then opting to cancel.

- **November**: Also sees significant cancellations, aligning with members who may not need memberships after holiday visits.

- **Lower Cancellation Months**: Months like January and April show less cancellations, as these are typically busy periods for professionals who prefer to retain travel points.

Average Duration of Enrollment among Canceled Members by Province

The following table provides insights into the average duration of enrollment for canceled members across different provinces:

- **New Brunswick**: Highest average duration at **1 year and 7 months**.

- **Prince Edward Island**: Lowest average duration at **1 year**.

Cancellations by Province

- **Ontario**: Experienced the highest number of cancellations at **674**.

- **British Columbia** and **Quebec**: Follow with notable cancellation figures i.e. 522 and 413

- **Newfoundland**, **Yukon**, and **Prince Edward Island**: Report the fewest cancellations, with **38**, **12**, and **11**, respectively.

Province	Cancelled Customers Count	Average_Of_Enrollment_Duration_Months	Average_Enrollment_Duration
Ontario	674	15.89	1 year 4 months
British Columbia	522	15.50	1 year 4 months
Quebec	413	15.48	1 year 3 months
Alberta	122	15.25	1 year 3 months
Manitoba	100	17.78	1 year 6 months
New Brunswick	67	19.21	1 year 7 months
Nova Scotia	58	16.79	1 year 5 months
Saskatchewan	50	16.38	1 year 4 months
Newfoundland	38	16.00	1 year 4 months
Yukon	12	14.17	1 year 2 months
Prince Edward Island	11	12.36	1 year 0 month
Total	**2067**	**15.88**	**1 year 4 months**

Conclusion

The analysis reveals significant factors influencing membership cancellations, including educational background, marital status, and seasonal trends. Understanding these patterns can help loyalty programs better address member needs and reduce cancellation rates through targeted marketing and engagement strategies.

Membership Cancellation Trends Analysis

Overview

This section examines the trends in membership cancellations across provinces, highlighting key demographics and identifying the most significant patterns influencing these cancellations.

Fastest Cancellation Rates by Province

Based on the map analysis, **Prince Edward Island** is indicated as the province where members cancel their memberships the fastest, with an average duration of just **12.36 months**. This province is represented by the bubble highlighted in the darkest shade of red.

Most Popular Months for Cancellations

The data shows that **December** is the most popular month for cancellations, aligning with the holiday season when many members may utilize their benefits before opting to cancel.

Popular Months for Cancellations

Cancellation Month	Count of Loyalty Number
12	213
11	212
8	208
7	186
10	180
9	176
6	165
1	155
3	149
5	148
Total	**2067**

Cancellations by Education and Marital Status

Cancellations by Education Level

- **Bachelor's Degree Holders**: This demographic accounts for the highest number of cancellations, with a total of **1,286** cancellations.

Education	Cancellations
Bachelor	1286
College	527
Doctor	96
High School or Below	93
Master	65

Cancellations by Marital Status

- **Married Customers**: This group exhibits the highest trend of cancellations, totaling **1,214** cancellations, indicating potential lifestyle factors influencing their decision.

Marital Status	Cancellations
Married	1214
Single	562
Divorced	291

Loyalty Card Members with Lowest Enrollment Duration

Among the loyalty card members who canceled, those with the **Aurora** card have the lowest enrollment duration, totaling **3,429 days** before cancellation.

Loyalty Card	Enrollment Duration Till Date
Aurora	3429
Nova	5671
Star	7637

Conclusion

The analysis reveals that Prince Edward Island has the fastest cancellation rates, with December being a peak month for cancellations. Additionally, bachelor's degree holders and married individuals are the most likely to cancel their memberships. Understanding these patterns can assist loyalty programs in developing targeted retention strategies.

Overview

To enhance enrollment and retention rates for Flying Whale Airlines, a comprehensive analysis of existing trends and behaviors is essential. This report outlines diagnostic, prescriptive, and retention strategies based on current data.

Enrollment Strategies

Descriptive Analysis
Currently, there are two enrollment types for Flying Whale Airlines: Standard and 2018 Promotions. Enrollment data from 2012 to 2018 shows that the year 2018 experienced the highest enrollments, totaling 3,010, largely due to the successful promotional campaign. In contrast, the Standard enrollment over six years accounted for 15,766 enrollments.

Diagnostic Analysis
The promotional success in 2018 highlights the effectiveness of targeted marketing strategies. Notably, enrollments spiked between February and April, with April having the highest at 346. The Standard enrollments peaked in November and December, likely influenced by the holiday season.

Prescriptive Analysis
- **Introduce Additional Promotions:** Given the success of the 2018 promotion, new promotional offers should be considered, particularly during Q1 (January-March) and Q2 (April-July).

- **Leverage Loyalty Cards:** Enhance the benefits of the Star Loyalty card, which has the highest enrollment, and consider targeted promotions for Nova and Aurora cardholders.

- **Refine Points Strategy:** Calculate the enrollment rate by analyzing the total population in each province and adjusting promotional strategies accordingly. A one-time enrollment plan for occasional travelers may also attract new members.

Retention Strategies

Understanding Customer Needs

Recognizing that retaining existing customers is generally more cost-effective than acquiring new ones, it's crucial to understand the motivations behind enrollment. Frequent flyers and occasional travelers may have different needs and expectations from their memberships.

- **Frequent Flyers:** Focus on earning points linked to distance and flight frequency, ensuring that the system rewards long-distance travelers.

- **Occasional Travelers:** Address the needs of those who primarily seek discounts for special occasions.

Targeting Low-Cancellation Demographics

Concentrate on demographics that exhibit lower cancellation rates, such as Doctors and Single Individuals, when designing promotional offers.

Enhancing Service Standards

Investigate customer feedback regarding service quality issues, such as maintenance, flight delays, and amenities. Analyze competitor strategies to elevate service standards and meet or exceed customer expectations.

Feedback Mechanisms

Establish regular feedback channels to understand the reasons behind cancellations better. This will inform targeted retention strategies.

Compensating Non-Redeemers

Create incentives for members who accumulate points without redeeming them. This could involve bonuses for reaching certain thresholds of points or loyalty.

Promotions for Companion Travel

Given that points are redeemed more frequently when members travel with companions, develop attractive offers for members traveling with others.

Focus on High-Value Customers

Utilize the Pareto Principle to identify and cater to the 20% of customers that contribute to 80% of revenue. Targeted marketing strategies for these high-CLV customers can significantly boost retention.

Conclusion

Implementing a multifaceted strategy focused on understanding customer needs, enhancing service quality, and leveraging successful promotional tactics can significantly improve both enrollment and retention rates. Utilizing data-driven insights will guide the development of tailored strategies to meet the needs of diverse customer segments effectively.