

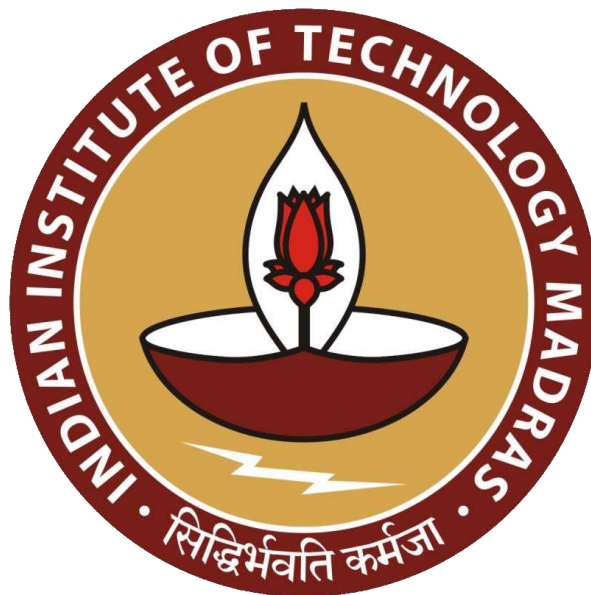
# **Enhancing Gym Business Sustainability: Overcoming Challenges and Boosting Customer Engagement**

## **Final Report for the BDM Capstone Project**

**Submitted by**

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## **Declaration Statement**

I am working on a project titled “Enhancing Gym Business Sustainability: Overcoming Challenges and Boosting Customer Engagement”. I extend my appreciation to Muscles Factory Gym, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analysed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. If plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate:

Name:

Date:

# 1 Executive Summary

In this capstone project titled “Enhancing Gym Business Sustainability: Overcoming Challenges and Boosting Customer Engagement”, I have engaged with Mr. Amit Chaudhary, a multi-business owner, who is facing challenges in his gym business “Muscle Factory Gym”. Amit Chaudhary’s business in the college setting is associated with general shops and bakery/canteen. He started a process of diversification of the business in another direction by opening a gym.

The current issues for the gym are mainly due to the establishment of a new and much better gym inside the college compound. The intense competition has reduced customer base and revenues which are made worse by lack of experience in the gym sector and high dependency on college students. To address these concerns, a data-driven approach was adopted, involving the collection and careful refinement of three pivotal sets of data.

Through a thorough examination of this data, I was able to uncover valuable observations and important measurements. These included the number of new members, the monthly revenue generated, the overall revenue, and the characteristics of our customers. It is worth highlighting that the analysis revealed a significant drop in customer retention during the later months.

After conducting an in-depth analysis of customer data, revenue trends, and feedback, several key recommendations have been identified to address the challenges faced by the business.

## 2 Proof of Originality

- Letter from organization: [Link](#)
- Photos and videos: [Link](#)

## 3 Detailed Explanation of Analysis Process/Method

The analysis process involved several key steps.

### 3.1 Data Collection

The organisation had the data on paper, so it was needed to digitalize the data in ‘csv’ or ‘excel’ format. The data was transformed manually as it was on the paper. After digitalizing the data, the datasets encompass valuable information; however, they are not devoid of flaws.

Challenges arise from problems like absent values, repetitive information, and inaccuracies in data format. To obtain significant insights, it is crucial to commence a data transformation procedure to tackle these shortcomings and improve the overall dataset quality.

### 3.2 Segmenting the Data

The dataset called "Package\_renewal" presented an exceptional challenge. It brought together details regarding subscription renewals across several months, leading to data entries that only had information for the specific month in which a customer renewed their subscription. In all other months, the dataset contained empty or blank values in different columns. Furthermore, the dataset included data about the payment amount made by customers during registration. This extra information posed a difficulty when analysing solely the data related to renewals. However, by segregating the data into separate monthly files, I have made the dataset more manageable and appropriate for analysis.

The feedback survey incorporates textual data, including opinions and suggestions, which lacks a defined format. To address this, I have distinguished this unstructured data from the well-organized information. This segmentation yields two distinct types of data: one suitable for visualization and another specifically geared towards understanding customer opinions. This strategic separation enhances the manageability of the feedback data, transforming it from a potentially messy dataset into a more engaging and insightful resource.

### 3.3 Removing Missing Values

After dividing the data into monthly files, I noticed the existence of absent values, which had been passed down from the original "Package\_renewal" dataset. To guarantee the integrity and accuracy of the data, I decided to eliminate the missing values from the renewal files, as it was essential to possess thorough and dependable data to analyse subscription renewals.

About the "Customer Information" dataset, I identified the absence of values in crucial columns like "Age", "Address", "Amount", and "Package\_type." Nevertheless, if I were to eliminate rows with missing values in this dataset, it would result in the loss of valuable information about the amount paid during registration and the specifics regarding the subscription start date. To confront this obstacle, I resolved to substitute the missing values in these columns with the term "unknown." This enabled me to retain the records and associated information, even in situations where specific details were unavailable.

After dividing the feedback data into segments, I observed that the text section had some empty spots. Nevertheless, since my main objective does not revolve around using these sections for visualizing or analysing statistics, the absence of information in those sections is not a worry. The purpose of these sections is simply to gain a better understanding of customer opinions.

### 3.4 Eliminating Redundant Data

After effectively dividing the information and addressing the missing values, the next obstacle was to eliminate repetitive data from the monthly files. These recurring entries contained details about the amount paid during both registration and renewal. Additionally, there was no obvious way to differentiate which rows corresponded to renewal transactions and which ones were associated with registration. To overcome this problem, I utilized the "Customer\_Id" from the "Customer Information" dataset. This unique identifier enabled me to connect and cross-check the payments with specific customers. By doing so, I could confidently remove the payments made during registration, ensuring that only the relevant renewal transactions were kept for analysis. This approach not only streamlined the dataset but also improved its accuracy and suitability for analysing payment trends related to renewal, while still preserving the necessary context provided by the "Customer Information" dataset.

### 3.5 Validating the Data

After eliminating unnecessary information and using Customer\_Id to distinguish, the subsequent vital stage was to guarantee the accuracy of the dataset by conducting extensive data validation. Throughout this procedure, I diligently examined the data and detected small inaccuracies, such as discrepancies in the date column. A particular problem that arose was the improper sequence of dates. For example, I noticed that "Dec-23" came before "January-23" in the data, which was incorrect. To rectify such errors related to dates, I implemented the essential corrective actions to establish a coherent and sequential order in the date column.

### 3.6 Creating Necessary Subsets for Analysis

After verifying the correctness of the data and addressing all problems, a further step in the process of analysis presented the opportunity to generate useful divisions in the dataset. These divisions helped gain much deeper insights and understanding into numerous aspects of the information. The generated divisions had the Revenue Dataset, taking interest in the earnings from registrations, renewals, and total earnings. In the present case, a Monthly Present

Contingency Table has been constructed towards analysing the reoccurring trends across categorical variables such as Gender, Address, and Package\_type. The Attrition Rate was calculated to determine the monthly number of customers who disconnect, and the count of new customers for each month revealed the trends in acquisition. Moreover, an Active Flag was put in place to track the status of active customers, which allowed for the analysis of their relationship with various variables.

Altogether, these segments facilitated a comprehensive analysis that empowered informed decision-making by taking into account factors such as revenue, customer demographics, attrition rates, and patterns of customer acquisition.

### 3.7 Data Visualisation

In the following phase, I created visual representations illustrating income information obtained from fresh sign-ups and renewals, as well as the distribution of active clientele every month. These representations were categorized by sex, package kind, and location to detect noticeable trends and patterns. The purpose of plotting income information based on various demographic factors like sex, package type, and location is to reveal any noticeable patterns or trends that could offer valuable insights. This approach enables a detailed comprehension of how these factors could influence income generation and customer activation.

Moreover, contingency tables were established to investigate the connections between categorical factors and the status of customer activation. This statistical method assists in identifying potential dependencies or independence between factors, shedding light on any significant relationships that may exist.

### 3.8 Hypothesis Testing

To evaluate the connection between being active and demographic factors like gender, location, and package type, we initially opted for the chi-square test. However, the data did not meet the requirement of the chi-square test, which mandates that each cell count must be 5 or higher. Consequently, we adopted an alternative statistical approach and utilized Fisher's exact test. Fisher's exact test is particularly suitable for cases where the dataset is small and cell counts might be below the threshold of 5. This test offers a robust analysis, enabling reliable evaluations of associations in scenarios where the chi-square test may not be applicable. By acknowledging and addressing the specific characteristics of the dataset, the use of Fisher's

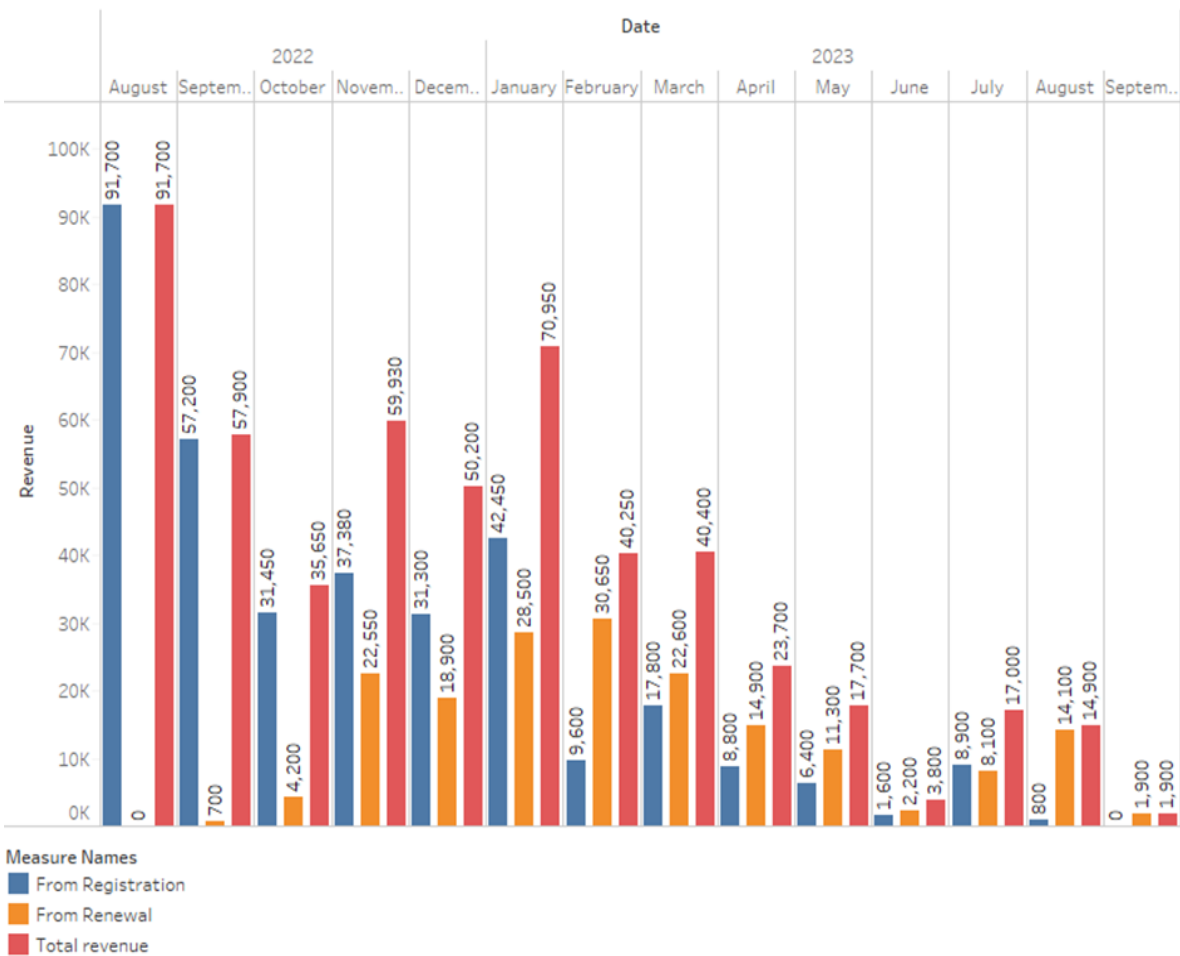
exact test guarantees the validity of the statistical analysis, providing accurate insights into the relationships between being active and the demographic factors under consideration.

## 4 Results and Findings

### 4.1 Findings From Customer Data

The bar chart (Figure 1) depicting the gym's revenue trends reveals a notable decline post-January. Peaks in revenue coincide with significant events: the gym's opening generated heightened interest due to a lack of nearby fitness facilities, while a January spike aligns with the surge in New Year's resolutions. This analysis underscores the impact of external factors on revenue fluctuations and offers valuable insights for strategic decision-making. Recognizing the contextual drivers behind these patterns enables the formulation of targeted interventions during downturns and the optimization of opportunities presented during peak periods.

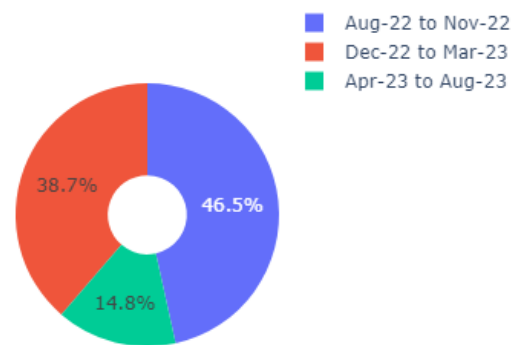
Figure 1: Revenue Plot





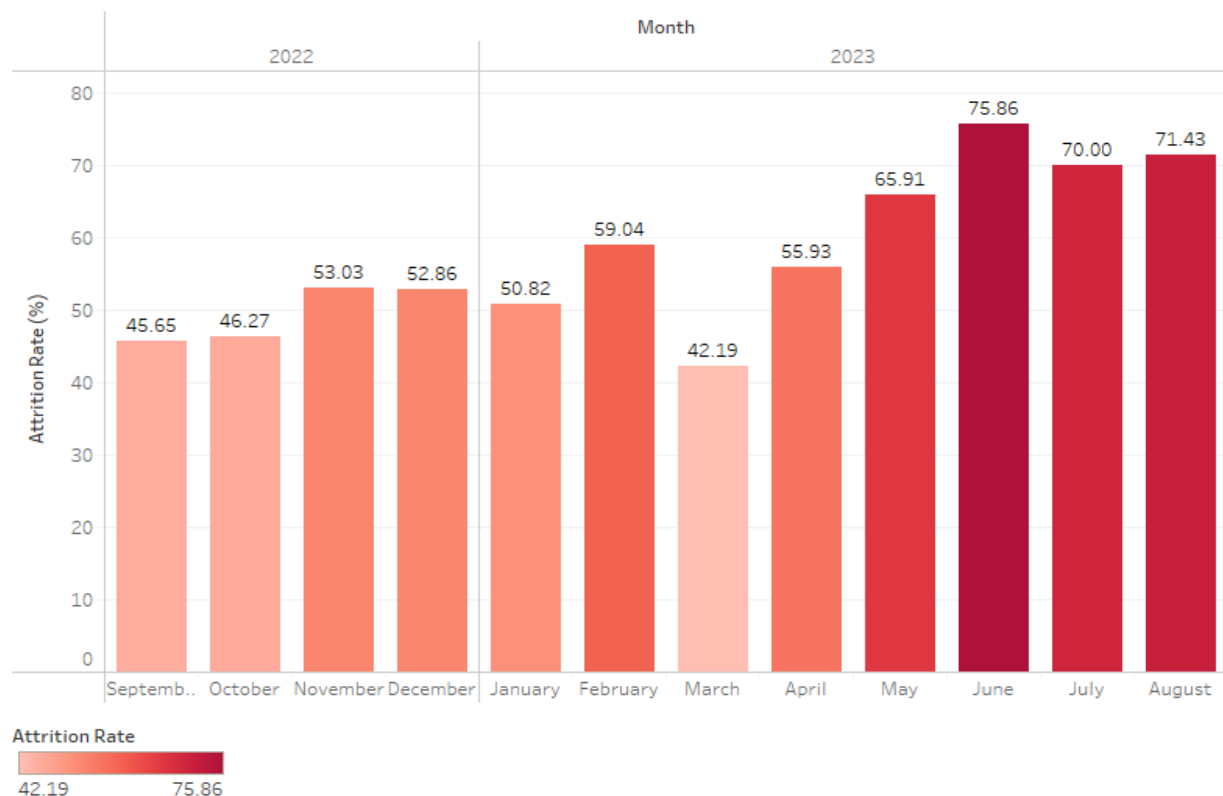
The gym's revenue collection pattern across distinct time periods (Figure 2) sheds light on its financial dynamics. The initial four months from Aug-22 to Nov-22 marked a robust start, accounting for 46.5% of the total revenue at ₹2,42,880.0. Subsequently, from Dec-22 to Mar-23, revenue remained substantial, contributing 38.7% at ₹2,01,800.0. However, a noticeable decline was observed in the last period, Apr-23 to Aug-23, where revenue dropped to ₹77,100.0, comprising 14.8% of the total.

Figure 2 Revenue of Different Time Periods



These attrition rates (Figure 3) represent the percentage of customers who discontinued their memberships or became inactive during each respective month. Analysing these rates over time can provide insights into trends. The noticeable uptick in attrition rates post-March 2023, with a significant spike exceeding 75% in June, is a critical observation signalling a substantial increase in customer churn during this period. Such a sharp rise in attrition rates suggests a pivotal turning point that demands a closer examination of underlying factors contributing to customer disengagement.

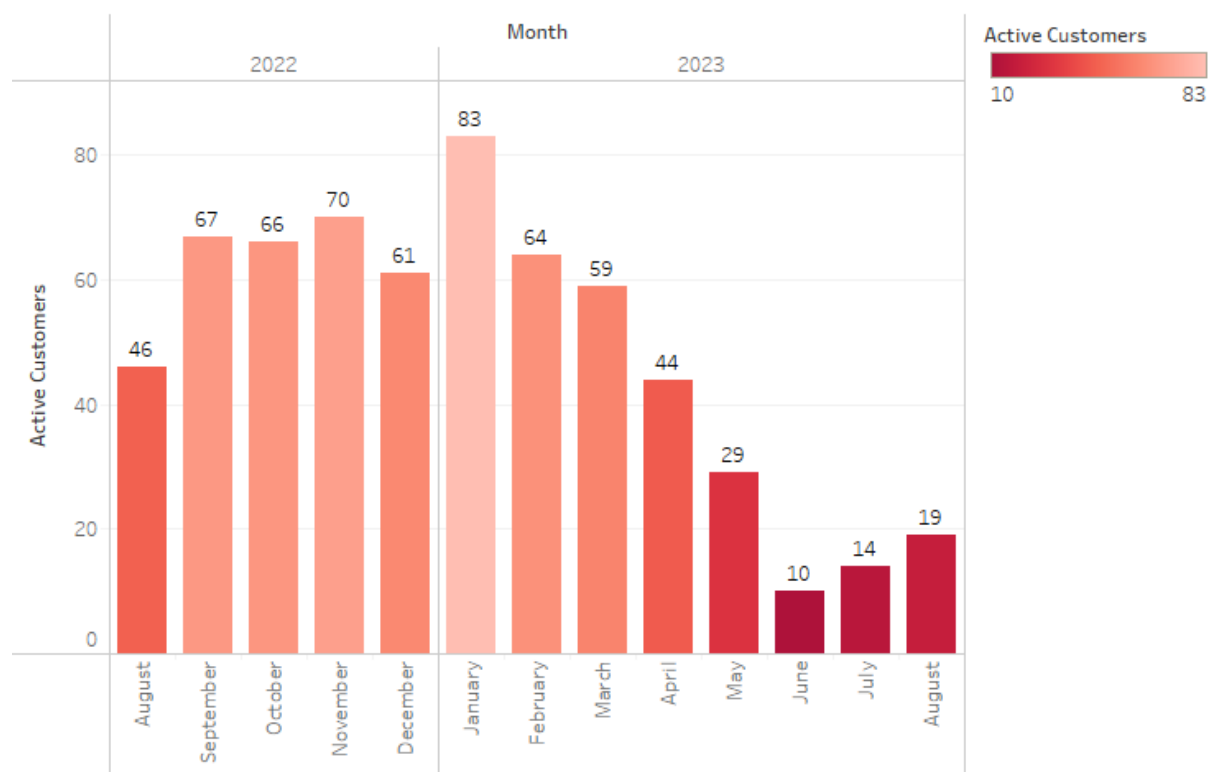
Figure 3 Attrition Rate for Each Month



Analysing the active number of customers based on various conditions, such as gender, location, and gym subscription package type, provides a deeper understanding of the factors influencing customer engagement. By plotting these variables, I gain insights into the gym's demographic dynamics and member preferences.

The bar plot of monthly active customers (Figure 4) gives the information of active customers in each month. providing a clear and easily interpretable snapshot of the gym's monthly performance.

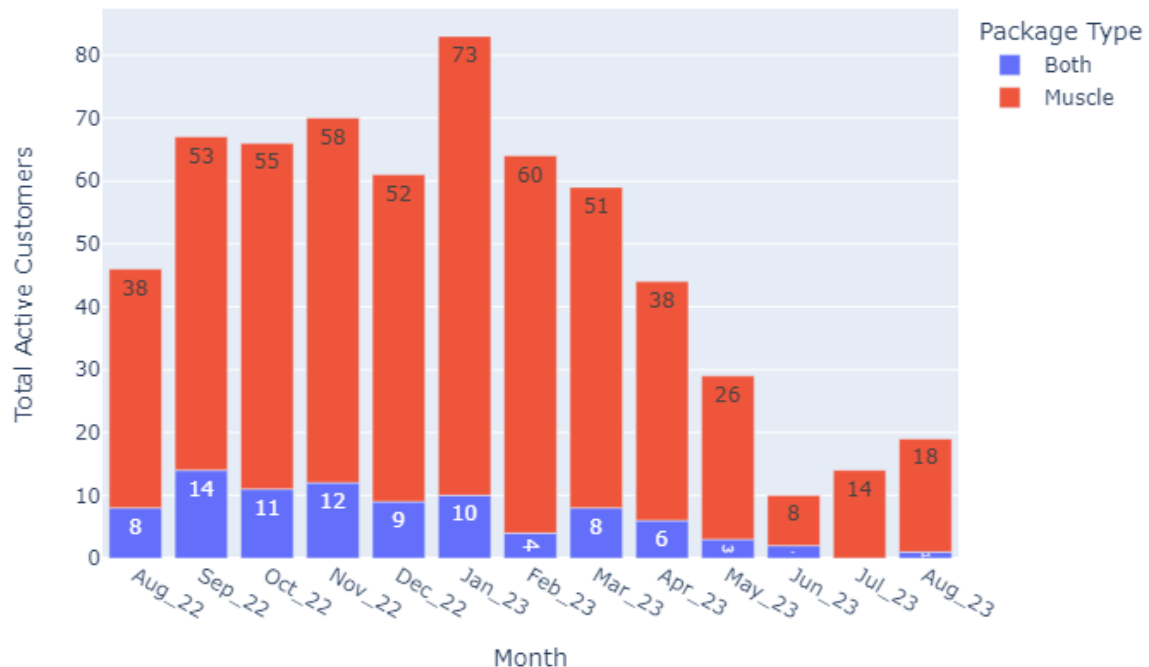
*Figure 4 Bar Plot of Monthly Active Customers*



The stacked bar chart (Figure 5) that displays the number of customers who are actively engaged, categorized by the type of package they have chosen 'Muscle' and 'Both (muscle and cardio)', offers a compelling visual insight into the preferences of customers. The clear contrast in the heights of the stacked bars vividly emphasizes that the Muscle package is significantly more popular than the Both package. The visual representation of customer distribution in these two categories unmistakably underlines the strong preference for the Muscle package among our active customers. This discovery not only sheds light on the current composition of our customer base but also presents an opportunity for targeted marketing or strategic adjustments

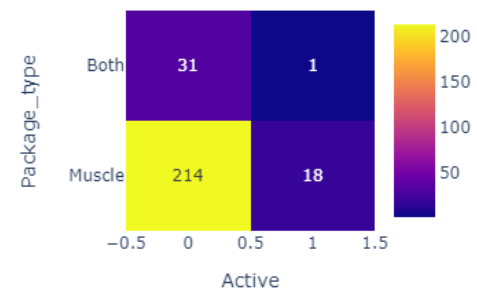
to increase the appeal and adoption of the ‘Both’ package, ultimately leading to a more balanced and diverse customer portfolio.

Figure 5 Stacked Bar Chart: Active Customers by Package Type



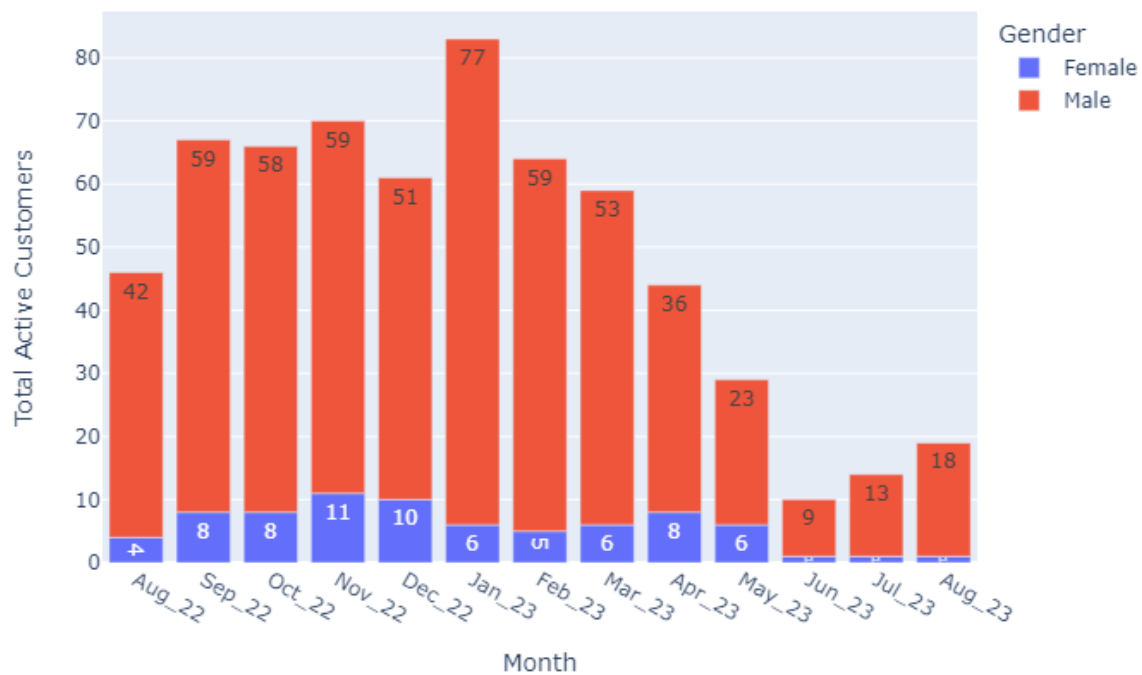
The Fisher's exact test was employed to examine the association between package type (Muscle and Both) and the active status of customers (1 for active, 0 for inactive) (Figure 6). The obtained p-value of 0.485 suggests that this observed association is not statistically significant at a conventional significance level (e.g., 0.05). Therefore, based on the Fisher's exact test, there is insufficient evidence to conclude a significant association between package type and customer activity status.

Figure 6 Package Type and Customer Activity Contingency



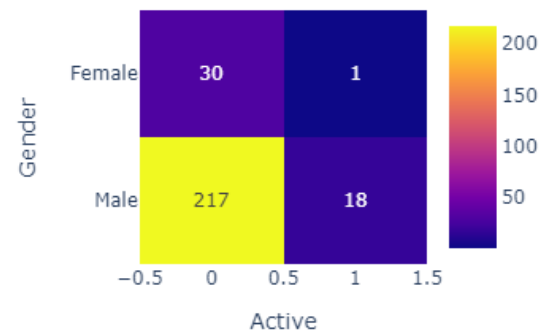
The stacked bar chart (Figure 7) displaying the breakdown of active customers by gender reveals a striking discrepancy between the number of active males and females. The graphical depiction emphasizes that the male population constitutes a substantially larger proportion of the engaged customer base, while the contribution from females seems relatively restricted. This observation prompts further investigation into the factors influencing gender-specific involvement and underscores the potential for focused efforts to bolster female participation.

Figure 7 Stacked Bar Chart: Active Customers by Gender



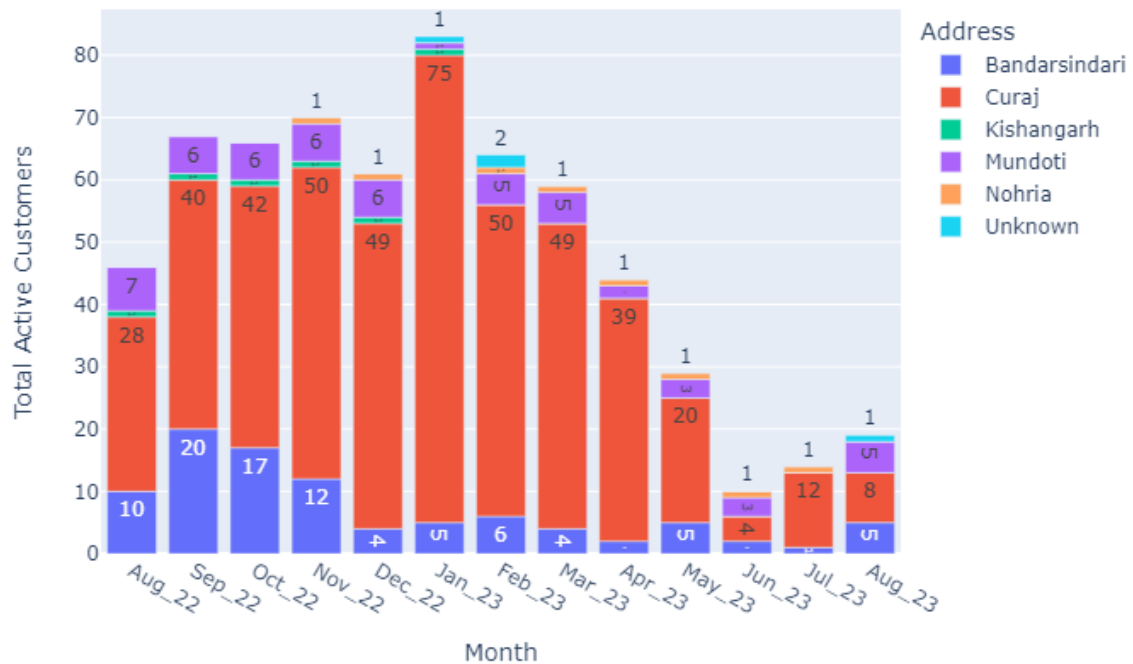
The Fisher's exact test was applied to assess the association between gender and the active status of customers (Figure 8). The obtained p-value of 0.708 suggests that there is no statistically significant association between gender and customer activity status at a conventional significance level (e.g., 0.05). Therefore, based on the Fisher's exact test, there is no compelling evidence to conclude that the likelihood of a customer being active is significantly different between genders. So, gender does not appear to be a significant factor influencing customer activity status.

Figure 8 Gender and Customer Activity Contingency



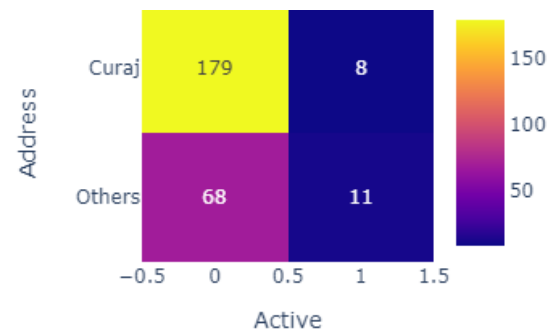
The customer activity chart for the location (address) (Figure 9) has revealed an intriguing revelation: a notable cluster of active customers originating from Curaj (Central University of Rajasthan). Astonishingly, the information indicates that the customer population from Curaj greatly exceeds the total count of customers from other areas. This finding emphasizes Curaj as the dominant customer base for the gym, emphasizing its crucial role in shaping the gym's overall monthly activity patterns.

Figure 9 Stacked Bar Chart: Active Customers by Address



In the next step, I wanted to assess whether the location of the customer is associated with their active status or not. However, the contingency table did not meet the requirements for conducting the chi-square and Fisher's exact tests. As a result, I decided to simplify the location column by categorizing it into two groups: "Curaj" and "Others" (representing all other places) (Figure 10). The chi-square test was then applied to evaluate the association between customer activity status and location. This statistical test examined whether the observed distribution of active and inactive customers across "Curaj" and "Others" was significantly different from what would be expected by chance. The calculated chi-square statistic of 6.4045, with 1 degree of freedom, yielded a p-value of 0.0114. The p-value falling below the standard significance level (e.g., 0.05) indicates a statistically significant association between customer activity status and location. The findings imply that the likelihood of a customer being active is not uniform across locations. Specifically, the distinction between "Curaj" and "Others" is noteworthy, suggesting that location influences customer activity status.

Figure 10 Address and Customer Activity Contingency

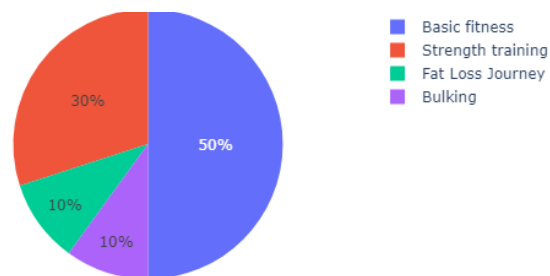


## 4.2 Findings From Feedback Data

The feedback survey received a minimal response, as only 20 individuals out of around 250 gym members participated. This presents a challenge when attempting to draw comprehensive conclusions. The small number of respondents may not accurately represent the diverse range of perspectives and experiences among all the members. However, the insights gathered from these 20 participants can still provide valuable qualitative feedback.

The investigation regarding the reasons why customers decide to join the gym provided enlightening outcomes, exposing a wide array of motivations (Figure 11). A noteworthy half of the participants mentioned fundamental fitness as their main aspiration, shedding light on a general inclination towards holistic well-being.

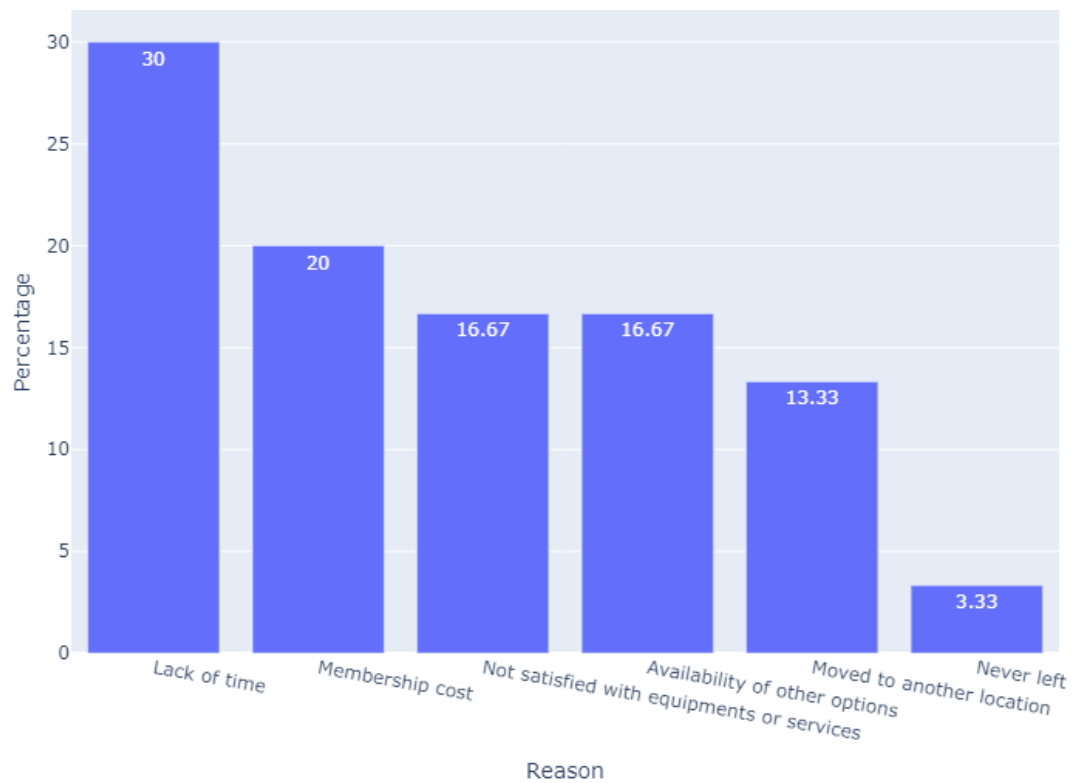
Figure 11 Pie Chart of Joining Reason



Furthermore, 30% conveyed a particular emphasis on bolstering their physical power, accentuating a longing to develop muscle mass and enhance overall strength. Each of the remaining 10% of individuals indicated undertaking a weight loss journey or pursuing a goal of augmenting their physique. These discoveries highlight the significance of customizing gym services and programs to accommodate diverse objectives, offering valuable insights for effectively engaging and satisfying customers.

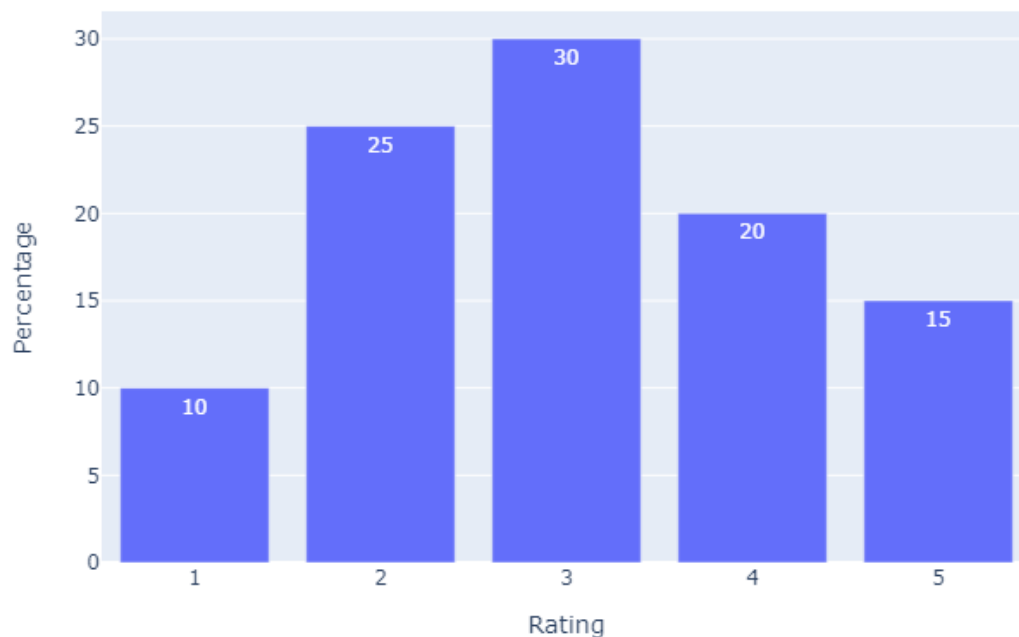
The data on customer reasons for leaving services (Figure 12) reveals key insights into the factors influencing customer attrition. The most prevalent reasons include "Lack of time" (30%) and "Membership cost" (20%), emphasizing the need to consider time constraints and pricing strategies. Issues related to service satisfaction and competition are also significant contributors, with "Not satisfied with equipment or services" and "Availability of other options" both at 16.67%.

Figure 12 Percent Bar Chart of Leaving Reasons

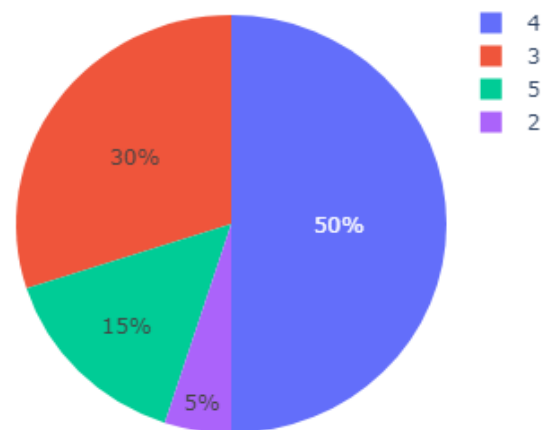


The distribution of ratings regarding pricing (Figure 13) offers a distinct representation of the degree to which customers are content. Remarkably, 65% of customers provided a rating of 3 or below, indicating their dissatisfaction with the pricing framework. Conversely, a mere 35% of clients assigned a rating of 4 or 5, implying that a smaller section found the pricing to be agreeable or pleasing. This disparity in ratings highlights a significant proportion of customers expressing their discontentment with the pricing, which suggests the need for improvement or modification in the pricing strategy to harmonize more effectively with customer expectations and augment overall contentment.

Figure 13 Bar Chart of Price Rating (in Percentages)



The overall experience ratings (Figure 14) from customers reflect a positive sentiment, with 65% providing ratings of 4 or 5 out of 5. This majority indicates a high level of satisfaction and contentment with the gym services and facilities. Additionally, 30% of customers rated their experience as a 3 out of 5, signifying a more neutral sentiment, suggesting that their experience was satisfactory but possibly with room for improvement. Only a minimal 5% of customers rated their experience as 2 or below, indicating a relatively small portion of individuals expressing dissatisfaction.



The feedback on disliked features and lacking amenities in the gym provides valuable insights into areas that may require attention and improvement. Some recurring themes include dissatisfaction with the loud and uninspiring music, concerns about trainers and associated costs, and issues related to the availability of heavy dumbbells, free squat racks, and incline benches. Notably, the absence of certain equipment like treadmills, calf raise seated machines, and normal squat machines is mentioned, suggesting a desire for a more comprehensive range of workout options. Additionally, customers express a need for better facilities such as changing rooms, washrooms, and even amenities like hot and cold-water coolers. The call for additional services includes requests for diet charts, trainer support, and designated areas for warm-up, cool down exercises, stretching, and proper guidance. Addressing these concerns could contribute to enhancing the overall gym experience and satisfaction of the clientele.

### 4.3 Insight From Expenditure Data

The expenditure details of the gym reveal a comprehensive breakdown of costs, with ₹15,00,000.00 allocated to equipment and accessories, ₹5,00,000.00 to infrastructure, ₹2,34,900.00 for expenses between August and April, and ₹24,400.00 for costs incurred from May to August. The total expenditure amounts to ₹22,59,300.00. From August 2022 to April 2023, the gym's average expenditure amounted to ₹26100. However, the running cost decreased significantly in the months between May 2023 and August 2023 to ₹6100. This decline in average expenses can be attributed to the departure of the gym's trainer. The absence of the trainer may have contributed to customer attrition. Additionally, as of the date when I



gathered this information, the gym's total revenue collection reached ₹521780.0, indicating a substantial **deficit of ₹1737520**.

Purpose	Amount
Equipment and Accessory	₹ 15,00,000.00
Infrastructure	₹ 5,00,000.00
August-April	₹ 2,34,900.00
May-August	₹ 24,400.00
Total	₹ 22,59,300.00

## 5 Interpretation of Results and Recommendation

After conducting a thorough analysis, it becomes evident that there was a significant decrease in both revenue and the number of active customers following March 23. Further examination revealed that while gender and package type were not directly linked to customer attrition, there was a notable discrepancy between the number of male and female customers, as well as between those with the "Muscle" package and the "Both" package. Additionally, it was observed that customer location played a role in gym attrition. A bar plot depicting the count of active customers by location revealed that Curaj had the largest customer base but experienced a substantial drop in active customer count after March 23.

Through personal conversations with customers and feedback forms, the main reasons for customer attrition were identified. The most frequently mentioned reason was a lack of time, followed by concerns about the cost of gym membership. Customers also expressed dissatisfaction with the gym's equipment, specifically noting the unavailability of certain items. Upon further investigation into the cost factor, it was discovered that the Muscle plan had a monthly membership fee of 1000rs, while the "Both" package (which included both cardio and muscle training) cost 1700rs per month. These prices were significantly higher compared to other gyms in the city offering similar facilities. Some customers pointed out that despite paying 1000 rupees for the muscle package, they were unable to use the treadmill without paying an additional 700rs. Others mentioned the lack of basic amenities such as changing rooms, washrooms, and even simple conveniences like hot and cold-water coolers.

Additionally, many customers from Curaj (Central University of Rajasthan) stated that the university had recently renovated its own gym, which offered free facilities such as treadmills and an air-conditioned environment to its students.

During the feedback survey regarding the university gym, students from Curaj reported various issues, including problems with timing, equipment quality, and relatively limited time slots for usage (each student was allocated a 45-minute time slot).

Based on the data and feedback from customers, I have some recommendations for the business. Here are a few suggestions:

*One aspect to consider is revising the pricing strategy to enhance competitiveness in the local market.* Evaluating the pricing structure of different packages, especially the "Muscle" and "Both" options, ensures alignment with customer expectations and local market standards. Transparent and inclusive pricing fosters perceived value, potentially attracting a broader customer base.

*To attract new members, offering a complimentary one-week personal training session can be effective.* This not only incentivizes potential customers but also allows them to experience the benefits of personalized guidance. The trial period serves as a demonstration of the trainer's expertise, addresses initial concerns, and may convert trial users into long-term members.

*Prioritizing the prompt filling of vacant trainer positions is crucial for consistent and dependable customer support.* Regularly evaluating staffing requirements and ensuring a competent and accessible training team helps in meeting member needs.

*Responding to customer concerns about equipment availability is vital.* Ensuring a well-maintained and diverse range of gym equipment enhances the gym's appeal, attracting customers with specific fitness preferences.

*Addressing identified issues with the university gym presents an opportunity.* Positioning the gym as a compelling alternative with flexible time slots, top-notch equipment, and effective crowd control measures can attract dissatisfied university students and staff.

*Investing in essential amenities* like changing rooms, restrooms, and water coolers improves the overall customer experience. Complimentary services, such as treadmill access, can make memberships more attractive.

*Fostering community and motivation through gym competitions,* like weightlifting or push-up challenges, creates a positive atmosphere and promotes camaraderie. Providing incentives or recognition for winners encourages participation.

*To diversify the customer base, expanding marketing efforts beyond the immediate vicinity to nearby villages is essential.* Advertising campaigns emphasizing facilities, competitive pricing, and special promotions can attract new members from neighbouring areas.

*Enhancing communication with customers* through regular updates on new facilities, promotions, and improvements, using social media for awareness, and conducting frequent surveys for ongoing feedback ensures that the gym's offerings align with evolving customer preferences.

By incorporating these recommendations, the gym can strive to create a more inclusive, appealing, and competitive fitness environment, thus reducing attrition and fostering sustained growth.

**Thank You**