**Ideation Phase**

**Define the Problem Statements**

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| Date | 06 May 2023 |
| Team ID | NM2023TMID01136 |
| Project Name | Airline Passenger Satisfaction |
| Maximum Marks | 2 Marks |

**Problem Statement for Airline Passenger Satisfaction:**

The problem at hand is to develop a machine learning model that can accurately predict and analyze airline passenger satisfaction. The objective is to leverage this model to identify the key factors that contribute to passenger satisfaction, enabling airlines to make data-driven decisions to enhance their services and improve customer experience.

Specifically, the problem can be defined as follows:

Given a dataset containing various attributes and features related to airline passengers' experiences, including factors such as flight punctuality, cabin cleanliness, in-flight entertainment, customer service quality, and overall experience rating, the goal is to build a machine learning model that can accurately predict passenger satisfaction levels. The model should be able to consider the complex relationships and interactions among the different features to generate reliable predictions.

Furthermore, the model should provide insights into the relative importance of each feature in influencing passenger satisfaction. By identifying the most significant factors, airlines can focus their resources and efforts on areas that have the greatest impact on customer satisfaction, leading to improved services and increased customer loyalty.

The solution to this problem will provide airlines with a powerful tool to analyze passenger satisfaction levels and gain a deeper understanding of the aspects that drive customer preferences. By leveraging machine learning techniques, airlines can proactively address potential issues, optimize their services, and ultimately enhance the overall travel experience for their passengers.

**Purpose Of The Project:**

The purpose of the project on airline passenger satisfaction is to:

1. Understand Customer Preferences: The project aims to analyze and understand the factors that contribute to passenger satisfaction. By examining various aspects of the airline experience, such as flight punctuality, cabin comfort, customer service quality, and in-flight amenities, the project can identify the elements that passengers value the most. This understanding helps airlines tailor their services to meet customer preferences and enhance overall satisfaction.

2. Improve Customer Experience: By accurately predicting passenger satisfaction levels, airlines can identify areas of improvement in their services. By addressing specific pain points or shortcomings, airlines can enhance the overall travel experience for their passengers. This leads to increased customer satisfaction, loyalty, and positive word-of-mouth recommendations.

3. Optimize Resource Allocation: By identifying the key factors influencing passenger satisfaction, the project helps airlines allocate their resources effectively. By focusing on the aspects that have the most significant impact on satisfaction, airlines can prioritize investments and improvements in those areas. This approach ensures that resources are utilized efficiently and effectively, leading to a better return on investment.

4. Competitive Advantage: In a highly competitive airline industry, providing an exceptional customer experience is crucial for attracting and retaining passengers. By actively monitoring and analyzing passenger satisfaction, airlines can differentiate themselves from competitors. Meeting or exceeding customer expectations can lead to a competitive advantage, increased market share, and enhanced brand reputation.

5. Data-Driven Decision Making: The project leverages machine learning techniques to extract insights and patterns from the data. By employing data-driven decision making, airlines can make informed choices regarding service improvements, resource allocation, and customer engagement strategies. This approach reduces reliance on intuition or subjective opinions and ensures that decisions are based on empirical evidence.

**Goal Of The Project :**

The goal of the airline passenger satisfaction project using machine learning (ML) is to develop a predictive model that accurately assesses and predicts passenger satisfaction levels based on various factors and attributes related to the airline experience. The ML model aims to achieve the following objectives:

1. Accurate Prediction: The primary goal is to build a model that can accurately predict passenger satisfaction levels. By leveraging historical data and applying ML algorithms, the model should be able to analyze the relationships and patterns within the data to generate reliable predictions of passenger satisfaction. The aim is to achieve high accuracy in predicting satisfaction levels for individual passengers or segments of passengers.

2. Feature Importance Analysis: The ML model should provide insights into the relative importance of different factors influencing passenger satisfaction. By quantifying the impact of various attributes, such as flight punctuality, seat comfort, food quality, and customer service, the model can identify the key drivers of passenger satisfaction. This analysis helps airlines understand which aspects of their services have the most significant impact on customer perception.

3. Actionable Insights: The ML model should provide actionable insights to improve passenger satisfaction. By understanding the key drivers of satisfaction, airlines can identify areas for improvement and take targeted actions to enhance their services. These insights can guide decision-making processes related to resource allocation, service enhancements, and operational changes that lead to improved customer satisfaction levels.

4. Personalized Recommendations: The ML model can be used to generate personalized recommendations for individual passengers. By analyzing a passenger's historical data and preferences, the model can suggest customized services, amenities, or experiences that are likely to enhance their satisfaction. These personalized recommendations contribute to a more tailored and personalized travel experience.

5. Continuous Monitoring and Improvement: The ML model can be deployed for continuous monitoring of passenger satisfaction levels over time. By regularly updating the model with new data and feedback, airlines can track changes in passenger preferences and satisfaction trends. This allows them to adapt their services and strategies in real-time to meet evolving customer expectations.

In summary, the goal of the airline passenger satisfaction project using ML is to develop a predictive model that accurately predicts passenger satisfaction levels, provides insights into the key drivers of satisfaction, offers actionable recommendations for improvement, and enables continuous monitoring and adaptation to enhance the overall passenger experience.