

SUMMARY: INTRODUCTION TO A BUSINESS PROBLEM

SESSION OVERVIEW:

By the end of this session, students will be able to:

- Handle business problems logically and analytically.
- Break down complex business issues into smaller, manageable parts and use data-driven techniques to solve them.

KEY TOPICS AND EXAMPLES:

The main idea of this session is to introduce a **business problem** to the students. With the help of that business problem we will be explaining the lifecycle of data analysis in detail. We are going to deep dive into each stage in the following sessions and help the students to understand each stage efficiently. Without real world examples, the students would face difficulty in understanding and would lag in implementation of the steps which would lead to not having the proper knowledge on the lifecycle of data analysis.

(BUSINESS PROBLEM:

ABC food company has a manufacturing and distribution division for their food products, which are sold directly to customers through their franchise outlets and websites. They provide a variety of sweet and fruit-based items. They track two kinds of data when they sell their goods: sales data and customer data. Over time, they have noticed a significant growth in both distribution and manufacturing.

The company has various teams, including management, production, marketing, analytics, growth, consumer, and sales, who work collaboratively to make the company profitable.

The management at ABC food company is facing a significant challenge - they want to introduce a new sweet product that incorporates the flavor of natural fruits, but they are unsure how to make it profitable. The company has identified this as a key problem and is actively seeking solutions to ensure the product's success.

Furthermore, the management team has observed a concerning trend of customers discontinuing the purchase of their products, also known as the Customer Churn problem. They are aware that this issue could impact the sales and profitability of their new product, and therefore are exploring strategies to mitigate this problem. In simple terms, the ABC Food company is encountering two problems:

- 1. How to target people who will buy their new product, made up of sweets and fruits.*
- 2. How to prevent customers from churning?*

DATASETS:

We have been provided with the ABC company marketing datasets which includes two datasets named Marketing_Campaign_df1 and Marketing_Campaign_df2.

Marketing campaign dataset-1

Marketing_Campaign_dfl

ID	Customer Identification number
Year_Birth	Year of birth
Education	Education detail of customer
Marital_Status	Marital status of customer
Income	Income of the customer
Kidhome	Number of kids at home
Teenhome	Number of teens at home
Dt_Customer	Customer registration date
Recency	Number of days since last purchase

Marketing_Campaign dataset-2

(The dataset contains around 2 years sales data which is between 2012-2014)

Marketing_Campaign_df2

ID	Customer Identification number
MntFruits	Amount spent on fruits
MntSweetProducts	Amount spent on sweet product
NumWebPurchases	Number of purchase through Web
NumStorePurchases	Number of purchase through Store

1. **Objective: Explanation of the business problem:**

The first step is the **objective of the problem or defining the problem**, which is a very crucial stage. Here are some importance of defining the problem and if the problem is not addressed properly what will be the consequences:

- **Direction and focus:**

Defining the problem sets the direction for the analysis. Without a clear understanding of what needs to be solved, the analysis may lack focus, leading to wasted time and resources on irrelevant or tangential analyses.

- **Relevance of data:**

A well-defined problem helps in determining the type and scope of data needed for analysis. Without a clear problem statement, there's a risk of collecting or analyzing irrelevant data that does not contribute to addressing the underlying issue.

- **Resource allocation:**
Defining the problem helps in allocating resources effectively. Without a clear problem statement, there's a risk of misallocating resources on unnecessary or low-priority analyses, resulting in inefficient use of time, money, and effort.
- **Quality of solution:**
Proper problem definition ensures that the analysis addresses the root cause of the problem rather than just symptoms. Without a clear understanding of the problem, the analysis may lead to superficial or incomplete solutions that fail to address the underlying issues.
- **Impact on decision-making:**
The goal of data analysis is to inform decision-making. A poorly defined problem can lead to flawed or misleading insights, resulting in suboptimal decisions that may have negative consequences for the organization.

Understanding the problems faced by ABC foods company in detail:

1. The management team aims to introduce a new sweet product that incorporates the flavor of natural fruits. **The problem lies in ensuring the profitability of this new product.**

Key questions to consider:

- **Who are the **target customers** for the new product?**
To understand the target market, the company needs to work on the data analysis to figure out the interested customers of the product.
Example:
Scenario 1: The company approaches 100 customers and 80 of them get converted and buy the new product. (With data analysis)
Scenario 2: Another company approaches 100 customers and 20 of them get converted and buy the new product. (Without data analysis)
So, we can conclude that using data analysis we can target the customer of the particular product and thus can increase the conversion rate.

The target audience for the ABC company: (Based on the problem statement, no analysis done)

Existing consumers: Individuals who purchase and consume the company's food products. Customers who have previously purchased the company's products and may be loyal to the brand. Retaining these customers and fostering brand loyalty could be a priority for the company.

Food Enthusiasts: Individuals who have a strong interest in food, culinary experiences, and exploring new flavors and products. This segment may be particularly interested in the company's innovative or unique offerings.

Existing Customers:

- **What are the preferences and buying behaviors of the target market?**
Example:

Myntra is launching a new product thus, it will try to understand the target audience and their preferences. Once it understands the preferences of the

customer for the brand then it will run the advertising campaign to those customers to increase its revenue and thus the company will be profitable.

2. Preventing Customer Churn:

***(Customer churn rate:** Churn rate, also known as customer attrition rate or customer churn, refers to the percentage of customers or subscribers who stop using a product or service within a certain period of time. It is a critical metric used by businesses to measure customer retention and loyalty.*

***Example:** Churn rate is typically calculated as follows:*

Churn Rate=(Number of customers who churned/Total number of customers)×100

For example, if a company starts with 1,000 customers and loses 50 of them in a month, the churn rate for that month would be:

churn Rate=(50/1000)×100=5%

Key questions to consider:

- a. What factors are contributing to customer churn?
- b. Are there specific customer segments that are more prone to churn?
- c. How can the company identify and predict customers at risk of churning?

2. Data gathering and understanding the data:

Importance:

- **Foundation for Analysis:** Data gathering lays the foundation for any data analysis project. Without sufficient and relevant data, it's impossible to derive meaningful insights or make informed decisions.
- **Basis for Informed Decision-Making:** Data gathering provides the necessary information for organizations to make informed decisions.
- **Enhanced Customer Understanding:** Gathering data on customer interactions and feedback helps organizations better understand their customers' needs, preferences, and pain points. This understanding is essential for delivering personalized experiences and building customer loyalty.

Consequences if not conducted correctly:

- **Missed Opportunities:** Without data gathering, organizations may miss out on valuable opportunities for growth, innovation, and improvement.
- **Limited Understanding of Customers:** Lack of data gathering means organizations have a limited understanding of their customers' needs, preferences, and behavior. This can result in ineffective marketing strategies, poor customer experiences, and reduced customer loyalty.

In this business problem we have two types of data from ABC company:

1. Customers data: (Dataset)

- a. **Year of birth:** This will help us understand the age distribution of customers. Understanding the age distribution of customers helps in segmenting the market and targeting specific age groups with tailored marketing strategies.

For example, younger customers may be more receptive to social media advertising, while older customers may prefer traditional media channels.

- b. **Education:** Understanding the education levels of customers helps in gauging their level of sophistication, knowledge, and interests.
- c. **Marital status:** Knowing customers' marital status helps in understanding their household dynamics and purchasing behaviors. For example, married couples may have different consumption patterns than single individuals, influencing their product preferences and buying decisions.
- d. **Income:** Knowing the income levels of customers helps in understanding their purchasing power and willingness to spend. It informs pricing strategies, product positioning, and the types of products or services that are affordable and desirable to different income segments.
- e. **Kidhome and teenhome:** These two columns are important for our business problem concern as kids and teens are the ones who might show a proper direction to the analysis. Analyzing the size of customers' households provides insights into their lifestyle and consumption habits.
- f. **Recency:** This criteria will help us to understand the frequency of the customers buying relatable products from the company.

2. Purchase history: (Dataset)

- a. **Amount of purchase:** This data helps in analyzing customer spending habits, average order value, and lifetime customer value.

By collecting and analyzing customer purchase history data, the ABC Food company can gain valuable insights into customers' buying behavior, preferences, and patterns, allowing them to optimize product offerings, marketing strategies, and customer experiences to drive sales and improve customer satisfaction.

(After data collection and little observation we figured out that the analyst might face different problems if both the datasets are not merged)

Problem Faced if we Do Not Merge the Tables:

Problem: Without merging the sales data with customer demographic data, the ABC Food company may miss out on valuable insights into the purchasing behavior of different customer segments. They may not be able to identify correlations between demographic factors (such as age, income level, or location) and purchasing patterns, which are essential for targeted marketing and product development strategies.

Importance of Merging Tables:

Merging tables allows the ABC Food company to integrate sales data with customer demographic data, providing a holistic view of customer behavior and preferences. It enables segmentation analysis to identify high-value customer segments, understand their needs and preferences, and tailor marketing efforts accordingly. Merging tables facilitates personalized marketing campaigns, product recommendations, and pricing strategies, leading to improved customer engagement, satisfaction, and retention.

Text-to-Columns is a useful feature for converting text data into a different data type, such as splitting text strings into multiple columns or converting text representations of dates into date values.



For example, Text-to-Columns can be used to divide the sales data's "Date" column into distinct columns for the day, month, and year in relation to the business problem.

This translation makes it simpler to use and analyze date-related data, making it possible to compute sales trends over several time periods, for example.

Text data can also be divided into several columns using Text-to-Columns depending on delimiters (space, comma, etc.), which enables text data to be converted into numerical or categorical representations as needed for analysis.



codingninjas