

## 1. Churn Rate

- **Definition:** The percentage of customers who leave the service over a given period.
- **Visualization:** Line chart or gauge to show churn rate trends over time.

## 2. Customer Segmentation

- **Definition:** Categorize customers based on various attributes (e.g., age, location, contract type).
- **Visualization:** Pie chart, bar chart, or heatmap to display the distribution of churn across different segments.

## 3. Churn Prediction

- **Definition:** Predict the likelihood of a customer churning based on historical data.
- **Visualization:** Use predictive modeling results to show the probability of churn for different customer segments. Display with a scatter plot or decision tree visualization.

## 4. Revenue Impact

- **Definition:** Analyze how churn affects overall revenue.
- **Visualization:** Line chart or bar chart showing revenue trends before and after churn events.

### 4.a. Define Key Metrics

1. **Churn Rate:** The percentage of customers who leave over a given period.

- Formula:  $\text{Churn Rate} =$

$\frac{\text{Number of Churned Customers}}{\text{Total Number of Customers at the Start of the Period}}$

2. **Revenue Per Customer:** The average revenue generated per customer.

- Formula:  $\text{Revenue Per Customer} =$

$\frac{\text{Total Revenue}}{\text{Total Number of Customers}}$

3. **Total Revenue Loss:** The total revenue lost due to churn.

- Formula:  $\text{Total Revenue Loss} =$

$\text{Churned Customers} \times \text{Revenue Per Customer}$

4. **Revenue Trend Analysis:** Compare revenue trends over time, particularly before and after churn events.

- Measure monthly or quarterly revenue and compare periods before and after significant churn events.

## 4.b. Data Preparation

1. **Gather Historical Data:** Collect data on customer churn events and revenue over time.  
Ensure you have:
  - Customer IDs
  - Dates of churn
  - Revenue associated with each customer
2. **Segment Data:** Break down data by periods, such as monthly or quarterly, to analyze revenue trends effectively.

## 4.c. Calculate Revenue Impact

1. **Before and After Revenue Comparison:**
  - Calculate average revenue before churn events.
  - Calculate average revenue after churn events.
  - Compare these averages to understand the impact.
2. **Revenue Loss Calculation:**
  - Identify the total number of customers who churned during a specific period.
  - Multiply this number by the average revenue per customer to estimate revenue lost due to churn.
3. **Visualize Revenue Impact:**
  - **Line Chart:** Plot revenue over time and highlight periods of high churn to see the impact visually.
  - **Bar Chart:** Show revenue before and after churn events to compare the impact.
  - **Stacked Bar Chart:** Breakdown revenue by customer segments or time periods to show how churn affects different parts of your business.

## 5. Customer Lifetime Value (CLV)

- **Definition:** Estimate the total revenue a customer will generate over their lifetime.
- **Visualization:** Bar chart or table to show CLV by customer segment.

## 6. Churn by Product/Service

- **Definition:** Determine which products or services have higher churn rates.
- **Visualization:** Bar chart or stacked column chart to compare churn rates across different products/services.

## 7. Retention Strategies Analysis

- **Definition:** Evaluate the effectiveness of different retention strategies.
- **Visualization:** Comparison charts to show churn rates before and after implementing retention strategies.

## 8. Customer Feedback Analysis

- **Definition:** Analyze feedback or survey data to understand reasons for churn.
- **Visualization:** Word clouds, bar charts, or sentiment analysis visualizations.

## 9. Churn Drivers

- **Definition:** Identify factors or conditions that are strongly associated with churn.
- **Visualization:** Correlation matrix or feature importance chart.

## 10. Geographical Analysis

- **Definition:** Analyze churn rates based on geographic locations.
- **Visualization:** Geographic map to visualize churn by region.

## 11. Contract Type Analysis

- **Definition:** Assess how different contract types impact churn rates.
- **Visualization:** Bar chart or pie chart showing churn rates by contract type.

## 12. Customer Usage Patterns

- **Definition:** Examine how usage patterns correlate with churn.
- **Visualization:** Heatmaps or scatter plots showing usage metrics vs. churn rates.

In a subscription-based business, even a small rate of monthly/quarterly churn will compound quickly over time. Just 1 percent monthly churn translates to almost 12 percent yearly churn. Given that it's far more expensive to acquire a new customer than to retain an existing one, businesses with high churn rates will quickly find themselves in a financial hole as they have to devote more and more resources to new customer acquisition."