

# Telco Customer Churn Project

## Business Scenario

You are a newly hired **BI Analyst** at a telecommunications company. In the past months, executives noticed a **high churn rate** (customers leaving the service) and raised concerns about **competitor offerings, pricing dissatisfaction, and service quality**.

Your job is to build a **Power BI model and dashboards** that (1) explain the churn problem clearly and (2) provide insights and actions to reduce churn in the next period.

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## Target Audience (Stakeholders)

- **Executives:** Need overall churn KPIs, trends, and revenue loss.
  - **Marketing Team:** Need demographic/geographic analysis and churn reasons for targeted campaigns.
  - **Customer Support:** Need service-level churn insights (Tech Support, Online Security, etc.).
  - **Finance:** Need financial impact analysis (Monthly Charges, Total Charges, CLTV).
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## Key Questions to Answer

**Q1.** What is the average lifetime value of a customer based on their monthly charges and tenure?

**Q2.** How many customers are currently active and have not churned?

**Q3.** What is the average revenue generated per active customer?

**Q4.** What percentage of total customers have churned?

**Q5.** How many customers have churned (i.e., stopped using the service)?

**Q6.** What is the total recurring monthly revenue generated from all active customers?

- Q7. How many unique customers does the company have in total?
- Q8. What is the average duration (in months) that customers stay subscribed?
- Q9. How much total revenue has been lost from churned customers?
- Q10. What is the total revenue earned from all customers?
- Q11. What percentage of customers have dependents?
- Q12. What percentage of active customers have partners?
- Q13. What percentage of total customers are senior citizens?
- Q14. What percentage of total services include Internet service?
- Q15. What percentage of customers subscribe to online security services?
- Q16. What percentage of customers use streaming services (TV or Movies)?
- Q17. What percentage of customers have opted for technical support services?
- Q18. What percentage of total customers are classified as “High Value”?
- Q19. What percentage of total customers are classified as “Low Value”?
- Q20. What percentage of total customers are classified as “Mid Value”?
- Q21. How many total services are being used across all customers?
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## Part A: Required DAX Measures

### 1- Average CLTV

```
#Average CLTV (from Monthly*Tenure) =  
AVERAGEX(  
    VALUES( 'dim_customer'[CustomerID] ),  
    CALCULATE(  
        SUMX(  
            'fact_subscriptions',  
            'fact_subscriptions'[MonthlyCharges] * 'fact_subscriptions'[TenureMonths]  
        )  
    )  
)
```

```
)  
)
```

---

## 2- Active Customers

```
Active Customers =  
CALCULATE(  
    DISTINCTCOUNT('dim_customer'[CustomerID]),  
    'fact_subscriptions'[ChurnFlag] = "no"  
)
```

---

## 3- Average Revenue per User (ARPU)

```
ARPU =  
DIVIDE(  
    SUM('fact_subscriptions'[TotalCharges]),  
    [1#Total Customers]  
)
```

---

## 4- Churn Rate %

```
Churn Rate % =  
DIVIDE(  
    CALCULATE(  
        DISTINCTCOUNT('dim_customer'[CustomerID]),  
        'fact_subscriptions'[ChurnFlag] = "yes"  
    ),  
    [1#Total Customers]  
)
```

---

## 5- Churned Customers

```
Churned Customers =  
CALCULATE(  
    DISTINCTCOUNT('dim_customer'[CustomerID]),  
    'fact_subscriptions'[ChurnFlag] = "yes"  
)
```

---

## 6- Monthly Recurring Revenue (MRR)

MRR = SUM('fact\_subscriptions'[MonthlyCharges])

---

## 7- Total Customers

Total Customers = DISTINCTCOUNT('dim\_customer'[CustomerID])

---

## 8- Average Tenure

Average Tenure =  
AVERAGE ( 'fact\_subscriptions'[TenureMonths] )

---

## 9- Churned Revenue

Churned Revenue =  
CALCULATE(  
SUM('fact\_subscriptions'[TotalCharges]),  
'fact\_subscriptions'[ChurnFlag] = "Yes"  
)

---

## 10- Total Revenue

Total Revenue =  
SUM ( 'fact\_subscriptions'[TotalCharges] )

---

## 11- Dependents %

Dependents % =  
DIVIDE (  
COUNTROWS ( FILTER ( 'dim\_customer', 'dim\_customer'[Dependents]= "Yes" ) ),  
[1#Total Customers], 0)

---

## 12- Partner %

Partner % =  
DIVIDE (  
COUNTROWS ( FILTER ( 'dim\_customer', 'dim\_customer'[Partner] = "Yes" ) ),  
[1#Active Customers],

0)

---

### 13- Senior Citizen

Senior Citizen % =

```
DIVIDE (
  COUNTROWS ( FILTER ( 'dim_customer', 'dim_customer'[SeniorCitizen] = "yes" ) ),
  [1#Total Customers],
  "no"
)
```

---

### 14- Internet Service

Internet Service % =

```
DIVIDE (
  COUNTROWS ( FILTER ( 'dim_services', 'dim_services'[InternetService] <> "No" ) ),
  [5#total services],
  0
)
```

---

### 15- Online Security %

Online Security % =

```
DIVIDE (
  COUNTROWS ( FILTER ( 'dim_services', 'dim_services'[OnlineSecurity] = "Yes" ) ),
  [5#total services],
  0
)
```

---

### 16- Streaming %

Streaming % =

VAR CustomersWithStreaming =

```
DISTINCT (
  SELECTCOLUMNS (
    FILTER (
      'dim_services',
      'dim_services'[StreamingTV] = "Yes"
      || 'dim_services'[StreamingMovies] = "Yes"
    ),

```

```

        "CustomerID", 'dim_services'[ServiceKey]
    )
)
RETURN
DIVIDE (
    COUNTROWS(CustomersWithStreaming),
    [5#total services],
    0
)

```

---

### 17- Tech Support %

Tech Support % =

```

DIVIDE (
    COUNTROWS ( FILTER ( 'dim_services', 'dim_services'[TechSupport] = "Yes" ) ),
    [5#total services],
    0
)

```

---

### 18- High Value Customers %

High Value Customers % =

```

DIVIDE (
    COUNTROWS ( FILTER ( 'fact_subscriptions', 'fact_subscriptions'[Customer Segment] =
"High Value" ) ),
    [1#Total Customers],
    0
)

```

---

### 19- Low Value Customers %

Low Value Customers % =

```

DIVIDE (
    COUNTROWS ( FILTER ( 'fact_subscriptions', 'fact_subscriptions'[Customer Segment] =
"Low Value" ) ),
    [1#Total Customers],
    0
)

```

---

### 20- Mid Value Customers %

```
Mid Value Customers % =  
DIVIDE (  
    COUNTROWS ( FILTER ( 'fact_subscriptions', 'fact_subscriptions'[Customer Segment] = "Mid  
Value" ) ),  
    [1#Total Customers],  
    0  
)
```

---

## 21- Total Services

total services = count(dim\_services[ServiceKey])

---

## Part B: Dashboard Design

### Page 1 – Executive Churn Overview

#### Visuals:

**CardsKPIs:** Churn Rate %, Total Customers, Total Churned Customers, Lost Revenue  
Total Revenue, Active Customers.

**Donut Chart:** Retained vs. Churned Customers.

**Bar Chart:** Top Churn Reasons

**Clustered Bar/Column Chart:** Churn % by Contract Type.

**Map/Geo Chart:** Churn distribution by City/Zip Code.

#### Key Questions Answered

Which churn reasons are most common?

Where cities/regions is churn most concentrated?

How does churn differ by contract type?

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### Page 2 – Churn & Revenue Impact

#### Visuals:

**Histogram/Bar Chart:** Churn % by Tenure Bracket.

**Bar Chart:** Churn % by Payment Method.

**Stacked Bar Chart:** Churn % by Internet Service Type.

**Matrix/Table:** Revenue & Lost Revenue by Customer Segment (Champion, Loyal,  
Hyper-Churner, Other).

**Table (with conditional formatting):** Top high-risk customer segments (Churn Score & CLTV).

**Bar Chart:** Lost Revenue by Reason (Competitor, Price, Service, Support).

### **Breakdowns per Segment:**

- Payment Method vs. Revenue/Lost Revenue
- Contract Type vs. Revenue/Lost Revenue
- Internet Service Type vs. Revenue/Lost Revenue

### **Key Questions Answered:**

Which customer segments are leaving fastest?

Which segments contribute most to total revenue and lost revenue?

How does lost revenue differ across payment methods, contract types, and service types?

Are high-value customers (CLTV) being lost?

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## **Page 3- Customer & Support Insights (for Marketing + Support Teams)**

### **Visuals:**

**Bar Chart:** Churn % by Support-Related Reasons (attitude, dissatisfaction, poor expertise).

**Matrix/Table:** Churn % by Optional Services (Tech Support, Online Security, Backup, Streaming).

**Histogram/Bar Chart:** Churn % by Tenure Bracket (with drill-down to reasons).

**Bar Chart:** Churn % by Contract Type (short vs long term, focus on early churners).

**Scatter Plot:** CLTV vs. Churn Score (to highlight pain points in high-value customers).

### **Key Questions Answered:**

Are service or support issues driving customer churn?

Which optional services correlate with retention or churn?

Are new customers (low tenure) more likely to leave due to poor onboarding/support?

What operational improvements (support training, better onboarding) could reduce churn?

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## **Page 4 – Customer Demographics**

### **Visuals:**

**Stacked Bar Chart:** Churn by Gender.

**Bar Chart:** Churn by Senior Citizen status.

**Map/Geo Chart:** Churn by City/Zip Code.

**Bar Chart:** Churn by Partner/Dependents.

### **Key Questions Answered:**

Do demographic factors (age, gender, dependents) influence churn?

Are senior citizens or single households more likely to churn?



Are there geographic hotspots where churn is higher?

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## Page 5 – Service & Contract Analysis

### Visuals:

**Clustered Bar Chart:** Churn % by Contract Type.

**Column Chart:** Churn % by Payment Method.

**Column Chart:** Churn % by Internet Service (DSL, Fiber, None).

**Matrix/Table:** Optional Services (Online Security, Backup, Tech Support, Streaming) vs. Churn.

### Key Questions Answered

How does contract type (month-to-month vs. yearly) affect churn?

Do certain payment methods correlate with higher churn?

Are Fiber or DSL customers more likely to leave?

Which optional services correlate with retention or churn?

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## Deliverables Checklist

- ☐ Power BI Data Model: Star schema design (Fact: Customers/Churn, Dimensions: Contracts, Geography, Demographics, Services, Payment).
- ☐ Five Power BI Report Pages: Executive Overview, Customer & Support Insights, Demographics, Service & Contract Analysis, Churn & Revenue Impact.
- ☐ Interactive Features: Slicers for filtering (City, Contract Type, Internet Service, Payment Method, Demographics).
- ☐ Executive Summary (5–8 bullet points): Highlighting key insights and recommended actions (e.g., improve Fiber pricing, incentivize contract upgrades, enhance support staff training).