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PROJECT ON

Customer Churn Analysis
Using Power BI

Agenda

- **Project Overview**
- **Data Source Data**
- **Preparation**
- **Dashboard Visualizations**
- **Applications & Recommendations**
- **Conclusion**
- **Any Queries**

Project Overview

- To analyze customer churn patterns and identify the key factors influencing customer attrition. To

- understand customer behavior based on demographics, service subscriptions, and billing information.

- To measure churn rate across various customer segments such as contract type, internet service, and payment method.

- To visualize business performance using interactive Power BI dashboards and KPIs.

- To predict churn risk and highlight high-risk customer segments for targeted retention strategies.

- To support data-driven decisions that can reduce churn, increase customer satisfaction, and improve revenue stability.

Data Source

- **Dataset Name: Telco Customer Churn Dataset**

- **Source: Kaggle**

- **File Type: Excel file**

- **Total Records: 7,043 customers**

- **Total Columns: 21 fields**

Data Preparation

- Imported dataset into Power BI Desktop from Excel file.

- Performed data cleaning using Power Query Editor to ensure accuracy and consistency.

- Checked and removed null values in columns like TotalCharges and replaced blanks where necessary.

- Converted TotalCharges from text to numeric.

- Ensured SeniorCitizen, Churn, and Partner were properly categorized as Yes/No or binary fields.

- Created calculated columns and DAX measures for:

- Churn Rate, Average Monthly Charges, Average Tenure, Total Revenue

- Standardized categorical values (No internet service changed to No for clarity).

- Added new derived fields for advanced analysis such as:

- Total Services Subscribed (count of services per customer) Validated

- the dataset to ensure no duplicates or mismatched entries.

- Loaded the cleaned data into the Power BI Model for visualization and analysis.

Dashboard Visualizations

1. Customer Demographics Dashboard

- **Visuals Used:**

- **Donut Chart → Gender distribution**

- **Bar Chart → Senior citizen vs. non-senior churn comparison Column**

- **Chart → Tenure segmentation**

- **Line Chart → Churn rate across tenure groups**

- **Cards → Total Customers, Churned Customers, Churn Rate, Avg. Tenure, Avg. Monthly Charges Purpose:**

- **Understand customer profile and churn behavior by demographics.**

Dashboard Visualizations

2. Service Subscription Dashboard

- **Visuals Used:**

- **Stacked Column Chart → Phone service and internet service usage**

- **Funnel Chart → Churn rate by Internet Service Type (DSL, Fiber Optic, No Internet)**

- **Clustered Bar Chart → Add-on service usage by churned customers**

- **Scatter Plot → Correlation between number of services and churn**

- **Pie Chart → Fiber vs. DSL vs. No Internet customers**

- **Slicers → Gender, Senior Citizen, Internet Service, Contract Type Purpose:**

- **Identify which services and combinations impact churn the most.**

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Dashboard Visualizations

3. Contract & Billing Dashboard

- **Visuals Used:**

- **Bar Chart → Churn by Contract Type (Month-to-month, One year, Two year)**

- **Donut Chart → Payment Method distribution**

- **Clustered Column Chart → Avg. Total Charges by Contract Type Line**

- **Chart → Monthly Charges by Payment Method Matrix/Table →**

- **Billing KPIs by Contract Type**

- **Cards → Avg. Monthly Charge, Avg. Total Charge, Churn Rate, Total Churned Customers**

- **Purpose: Analyze billing behavior and contractual patterns influencing churn.**

CUSTOMER CHURN ANALYSIS

1.CUSTOMER DEMOGRAPHICS

7043	**1869**	**0.27**	**64.76**	**32.37**
TotalCustomers	ChurnedCustomers	ChurnRate	AvgMonthlyCharge	AvgTenure

gender
- ☐ Female
- ☐ Male

Churn
- ☐ No
- ☐ Yes

Count of customerID by gender

3.49K (49.52...)

3.56K (50.48...)

gender
- ● Male
- ● Female

Count of customerID by TenureRange

- 6+ years: 2.2K
- 0-1 year: 2.2K
- 2-4 year: 1.6K
- 1-2 year: 1.0K
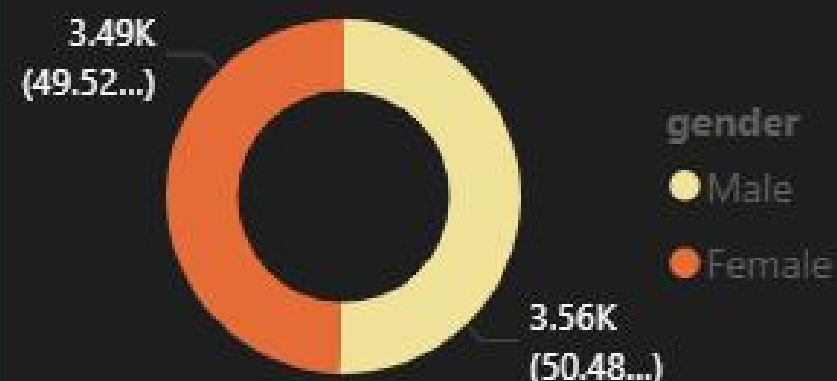
AvgMonthlyCharge by TenureRange

- 6+ years: 74
- 2-4 year: 66
- 1-2 year: 61
- 0-1 year: 56

Count of customerID by SeniorCitizen and Churn

Churn ● No ● Yes

0: No 4.5K
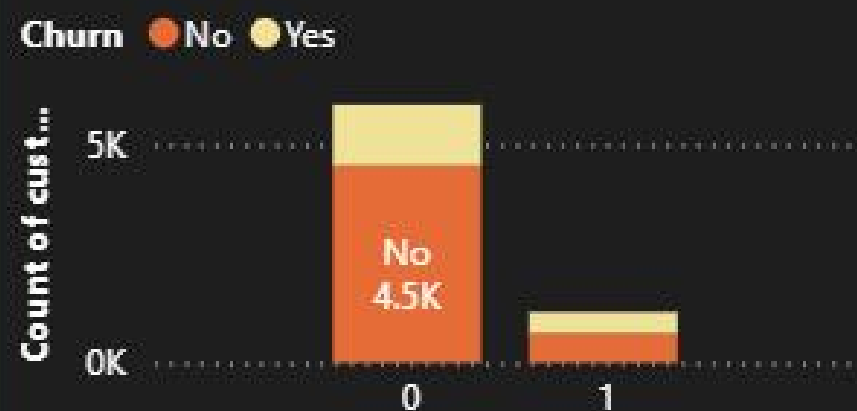
ChurnRate by TenureRange

- 0-1 year: 0.47
- 1-2 year: 0.29
- 2-4 year: 0.20
- 6+ years: 0.10
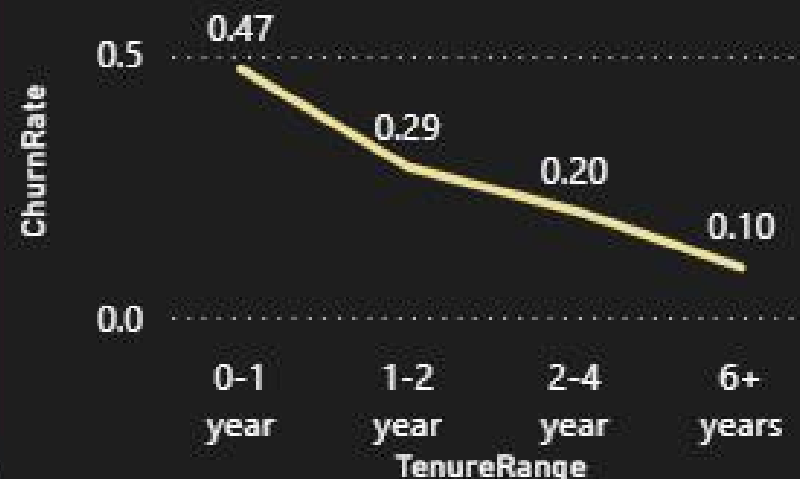
Count of MonthlyCharges by tenure and gender

gender ● Female ● Male

329, 284, 51, 34, 30, 47, 40, 27, 45, 27, 30, 185, 177
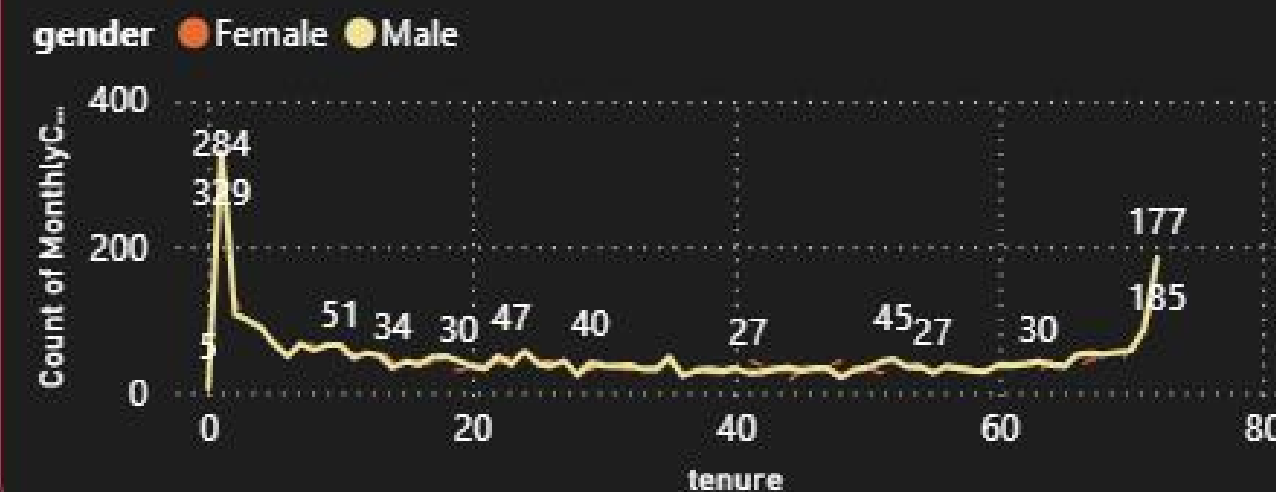
2.SERVICE SUBSCRIPTION ANALYSIS

InternetService
- [ ] DSL
- [ ] Fiber optic
- [ ] No

PhoneService
- [ ] No
- [ ] Yes

MultipleLines
- [ ] No
- [ ] No phone se..
- [ ] Yes

Contract
- [ ] Month-to-m..
- [ ] One year
- [ ] Two year

Churn
- [ ] No
- [ ] Yes

Count of customerID by PhoneService

- 1K (9.68%)
- 6K (90.32%)

PhoneService
- 🔴 Yes
- 🟡 No

ChurnRate by InternetService

InternetService	ChurnRate
Fiber optic	0.42
DSL	0.19
No	0.07

Count of customerID by InternetService and Churn

Churn 🟡 No 🔴 Yes

InternetService	No	Yes
Fiber optic	1799	1297
DSL	1962	459
No	1413	113

ChurnRate by Churn

- 0.361... (26.5...)
- 1 (73.46%)
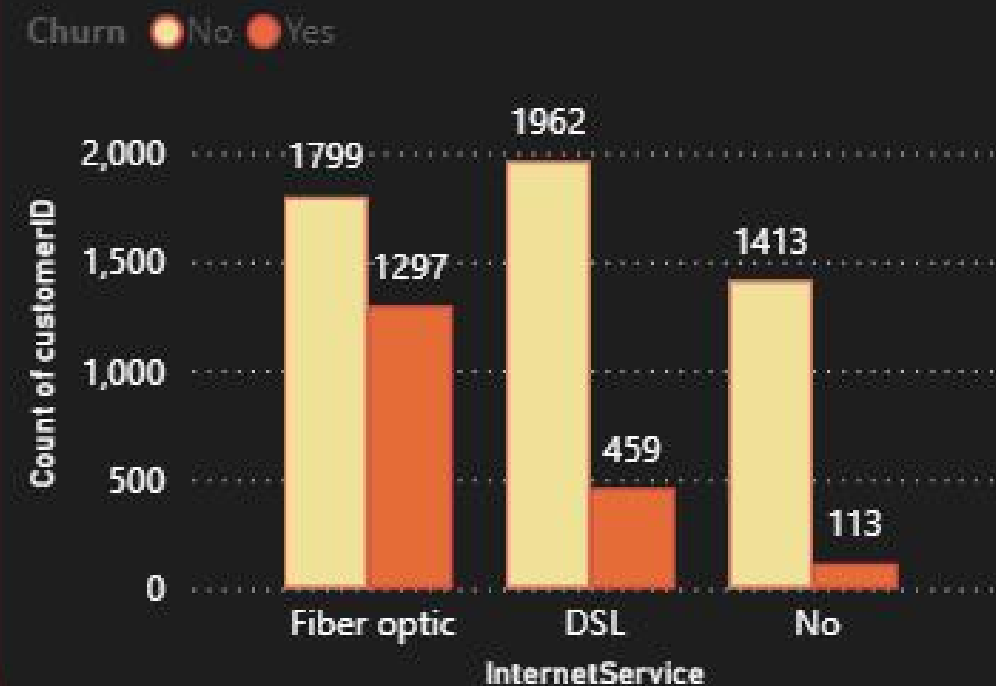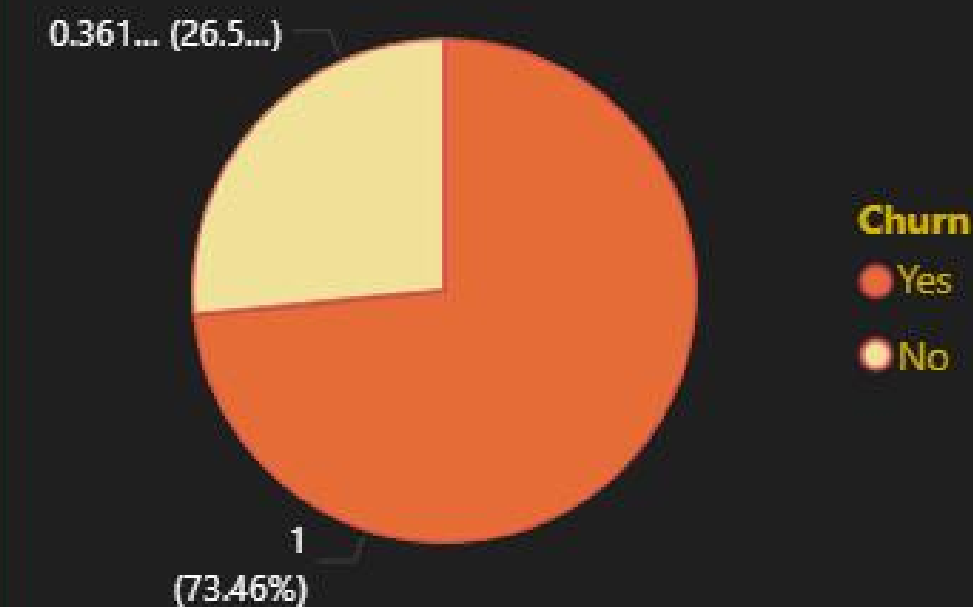
Churn
- 🔴 Yes
- 🟡 No

Count of customerID and ChurnRate by InternetService

🔴 Count of customerID 🔵 ChurnRate

InternetService	Count of customerID	ChurnRate
Fiber optic	3.1K	0.42
DSL	2.4K	0.19
No	1.5K	0.07

7043 TotalCustomers

1869 ChurnedCustom...

0.27 ChurnRate

64.76 AvgMonthlyChar...
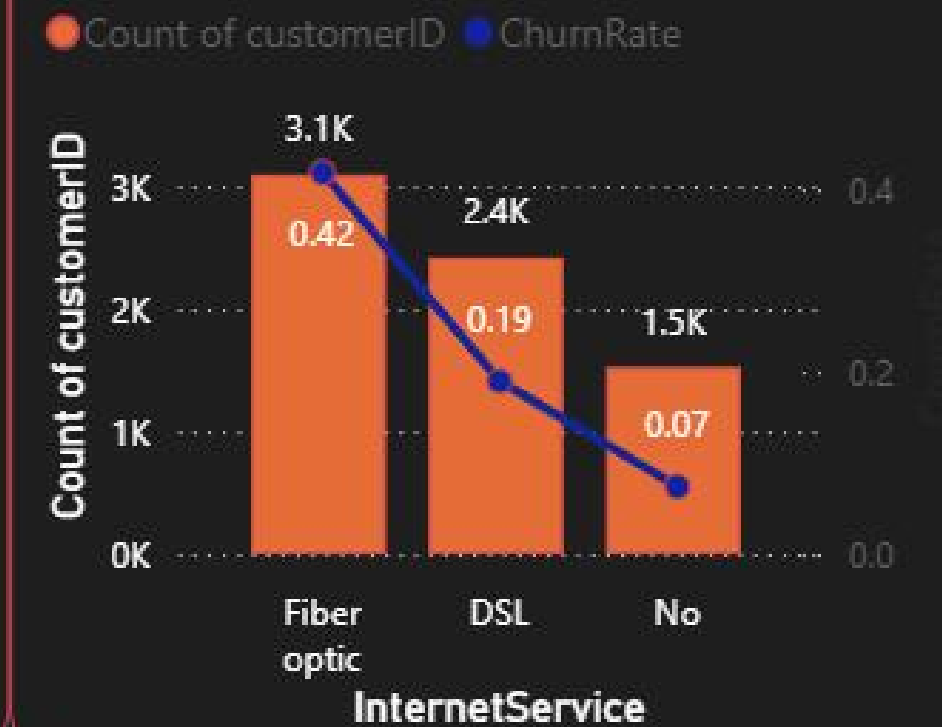
3.CONTRACT & BILLING INSIGHTS

Contract
- ☐ Month-to-month
- ☐ One year
- ☐ Two year

PaymentMethod
- ☐ Bank transfer (auto...
- ☐ Credit card (autom...
- ☐ Electronic check
- ☐ Mailed check

PaperlessBilling
- ☐ No
- ☐ Yes

Churn
- ☐ No
- ☐ Yes

0.27	**64.76**	**2.28K**	**1869**	**16.06M**
ChurnRate	AvgMonthlyCharge	AverageTotalCharge	ChurnedCustomers	TotalRevenue

Count of Churn by Contract

Count of Churn (y-axis): 4K, 2K, 0K
- Month-t...: 3.9K
- Two year: 1.7K
- One year: 1.5K

Contract (x-axis)

CustomerSegment	ChurnRate
Two year | No | Mailed check	0.01
Two year | No | Credit card (automatic)	0.01
Two year | No | Bank transfer (automatic)	0.01
Two year | Fiber optic | Mailed check	0.05
Two year | Fiber optic | Electronic check	0.10
Two year | Fiber optic | Credit card (automatic)	0.04
Two year | Fiber optic | Bank transfer (automatic)	0.09
Two year | DSL | Electronic check	0.07
Total	**0.27**

Count of customerID by PaperlessBilling and Churn

Churn: ● No ● Yes

Count of customer... (y-axis): 2K, 0K
- Yes: 2.8K (No), 1.4K (Yes)
- No: 2.4K (No), 0.5K (Yes)

PaperlessBilling (x-axis)

Count of customerID by TenureRange and Contract

Contract: ● Month-to-month ● One year ● Two year

Count of customerID (y-axis): 2K, 1K, 0K
- 6+ years: 0.3K, 0.6K, 1.3K
- 0-1 year: 2.0K, 0.1K
- 2-4 year: 0.8K, 0.5K, 0.3K
- 1-2 year: 0.7K, 0.2K

TenureRange (x-axis)

ChurnRate by PaymentMethod

0.152... (15....)
0.... (...)
0.1910... (19.8...)

PaymentMeth...
- ● Electronic c...
- ● Mailed check
- ● Bank transf...
- ● Credit card ...

Sum of MonthlyCharges by PaymentMethod

Sum of MonthlyCharges (y-axis): 0.2M, 0.1M, 0.0M
- Electroni...: 0.18M
- Bank tran...: 0.10M
- Credit car...: 0.10M
- Mailed c...: 0.07M

PaymentMethod (x-axis)

Applications & Recommendations

Applications

- **Used by Marketing Teams to identify and target high-risk customers with retention offers.**
- **Helps Customer Support prioritize service improvement for segments with high churn.**
- **Enables Management to track key churn KPIs and make data-driven strategic decisions.**
- **Supports Product Teams in optimizing service bundles and pricing models.**

Recommendations

- **Encourage long-term contracts (1-year or 2-year plans) through discounts and loyalty rewards.**
- **Promote bundled service packages (e.g., Internet + Streaming + Security) to reduce churn.**
- **Improve customer retention by offering personalized plans for senior citizens and high-charge users.**
- **Educate customers about benefits of online backup and device protection services, as these reduce churn.**
- **Monitor monthly charges and payment issues closely for early churn indicators.**

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Conclusion

- The Power BI dashboards provided clear visibility into customer churn behavior and patterns. Analysis
- revealed that high monthly charges, month-to-month contracts, and fiber optic services are major churn drivers.
- Customers with longer tenure and multiple service subscriptions show greater loyalty and lower churn.
- Demographic factors such as senior citizen status and partner/dependent presence also influence churn tendency.
- The insights enable the company to design targeted retention strategies and reduce customer loss.
- Implementing data-driven actions can help boost customer satisfaction, increase retention rate, and maximize revenue.
- Overall, the project demonstrates how Power BI transforms raw data into actionable business insights for strategic decision-making.

THANK YOU