IBM TELCO CUSTOMER CHURN DATASET

This SQL project used hypothetical questions using the IBM telco customer churn dataset to analyze a fictional telco company to reduce attrition

Customer Retention Analysis

Contents

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Query1

Considering the top 5 groups with the highest average monthly charges among churned customers, how can personalized offers be tailored based on age, gender, and contract type to potentially improve customer retention rates?

Query execution

```
select css.Churn_Label, cs.phone_service, cs.Internet_Service, cs.offer, cs.Contract, cd.Age,
cd.Gender, cs.Monthly_Charge as Avg_Monthly_Charges from customer_churn_services cs

join customer_churn_status css on css.Customer_ID = cs.Customer_ID

join customer_churn_demographics cd on cd.Customer_ID = css.Customer_ID

where Churn_Label = "Yes"

Order By cs.Monthly_Charge desc

Limit 5;
```

Churn_Label	phone_service	Internet_Service	offer	Contract	Age	Gender	Avg_Monthly_Charges
Yes	Yes	Yes	None	One Year	53	Male	118.35
Yes	Yes	Yes	None	One Year	31	Male	117.8
Yes	Yes	Yes	None	Month-to-Month	76	Female	117.45
Yes	Yes	Yes	Offer A	Two Year	25	Male	116.2
Yes	Yes	Yes	Offer A	One Year	51	Male	115.65

Query Explanation

To unearth the top 5 groups with the highest average monthly charges join function was used first to make the Customer Churn Services table speak with the Customer Churn Status table in order to filter out the combined Phone and Internet services average monthly charges only for the “Churned” customers. In doing so only Churn Label column was called from customer status table with the where clause filtering results only for the “Yes” i.e. churned customers. Then another join function was used to join table Customer Churn Demographics to show which Age Groups, Gender did these 5 groups belonged to. Contract type was used from Customer Churn Services table. Limit of 5 was put to ensure results are given for the 5 highest monthly charged customers that churned.

Before analyzing the service by demographics to learn the dynamics of these churned customers the commonality which can be seen using the exhaustive query below is that all were utilizing the phone and internet services. All had subscribed for multiple lines, premium tech support, online security, online backup, device protection plans. However, while 4 of these were also subscribed for unlimited data only one of the churned customer was not.

Query 1 A

```
select cs.Customer_ID, cs.Churn_Label, css.phone_service, css.internet_service,
css.Avg_Monthly_GB_Download, css.Avg_Monthly_Long_Distance_Charges,
css.Unlimited_Data, css.Premium_Tech_Support, css.Multiple_Lines, css.Online_Security,
css.Online_Backup, css.Device_Protection_Plan, css.monthly_charge as
AVG_Monthly_Charge from customer_churn_status cs

inner join customer_churn_services css on cs.Customer_ID = css.Customer_ID

where Churn_Label = "Yes"

Order By css.Monthly_Charge desc

Limit 5;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Customer_ID	Churn_Label	phone_service	internet_service	Avg_Monthly_GB_Download	Avg_Monthly_Long_Distance_Charges	Unlimited_Data	Premium_Tech_Support	Multiple_Lines
8199-ZLLSA	Yes	Yes	Yes	27	22.66	Yes	Yes	Yes
2889-FPWRM	Yes	Yes	Yes	8	34.87	Yes	Yes	Yes
2302-ANTDP	Yes	Yes	Yes	5	43.04	Yes	Yes	Yes
9053-JZFKV	Yes	Yes	Yes	71	33.88	Yes	Yes	Yes

Multiple_Lines	Online_Security	Online_Backup	Device_Protection_Plan	AVG_Monthly_Charge
Yes	Yes	Yes	Yes	118.35
Yes	Yes	Yes	Yes	117.8
Yes	Yes	Yes	Yes	117.45
Yes	Yes	Yes	Yes	116.2

The result shows that the highest average monthly rate was worth 118.35 for a churned customer who was availing both the Phone service as well as the Internet Service. The customer was a 53 year old male who was on a 1 year Contract. He did not take any offer.

Next in line was a churned customer who was on a 117.8 worth monthly subscription for 1 year. The customer was a 31 year old male again on a 1 year contract without any offer. Then there

was a female senior citizen aged 76 years old on a month to month contract and the average monthly charge was 117.45 without any offer availed.

Then was an under 30 25 year old male on a 2 year contract where the average monthly charges were 116.2. Interestingly this customer was availing offer A.

Last amongst the top 5 was a churned customer aged 51 years and the monthly charges for his 1 year contract was 115.65 and he was also on Offer A.

As a customer retention specialist from Customer Success or the renewals department

Hence, as it can be seen that the top 5 churned customers by average monthly rate were either not availing an offer or just took offer A. However, it can be seen by removing the limit that there was attrition even amongst customers who were availing Offer B, C, D, E as well.

Therefore, realizing the need for personalized offers based on age, gender and contract first we need to look into the existing offers to understand the dynamics of where the offers might have went wrong?

Descriptive Analysis

Offer A

Offer A appears to target both males and females in the age range of 21 to 51, with customers both under and over 30 years old. The churned customer count is 35, with the oldest customer being 69. The contract types are primarily 1-year and 2-year agreements. The average monthly charge for this offer is 54.20, and the main reason for churn was the lack of phone service.

Offer B

A total of 101 customers churned from Offer B, with ages ranging from 19 to 80. This offer includes a mix of contract types and is utilized by both genders. The average monthly rate varies significantly, with a high of 114.50 and a low of 19.75. Customers used a combination of services, including internet, phone, or both.

Offer C

Offer C experienced a churn of 95 customers, primarily on month-to-month or 1-year contracts, with one exception for a 2-year contract. The age range of churned customers is 19 to 76, encompassing both genders. The monthly charges ranged from a minimum of 24.75 to a maximum of 110.45. While most customers used a combination of both services, some opted for only one service.

Offer D

Offer D had 161 churned customers, with ages spanning from 20 to 78. The customer base consists of both males and females, with the majority on month-to-month contracts. Monthly charges ranged from a minimum of 19 to a maximum of 103.90.

Offer E

Offer E saw a churn of 426 customers, utilizing either one or both services. The monthly charges varied widely, with a maximum of 109.80 and a minimum of 18.95. Most customers were on month-to-month contracts, and their ages ranged from 20 to 71, including both genders.

Diagnostic Analysis

From the above it seems that customers availing offer E churned the most and the nature of churn was due to a monthly contract. Not much of gender or age factor. Offer D had similar patterns. Offer A that has the least churned customers seem to be on a 1 year or 2 year contract.

This diagnosis was done by adding a clause of AND Offer = Offer ‘n’ in front of the where clause for Churn Label = ‘Yes’ in the same query executed for the Top 5 monthly charge churned customers.

```
39    where Churn_Label = "Yes"  AND Offer = "Offer E"
40    Order By cs.Monthly Charge desc;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Churn_Label	phone_service	Internet_Service	offer	Contract	Age	Gender	Avg_Monthly_Charges
Yes	Yes	No	Offer E	Month-to-Month	38	Female	19.6
Yes	Yes	No	Offer E	Month-to-Month	42	Male	19.45
Yes	Yes	No	Offer E	Month-to-Month	53	Male	19.35
Yes	Yes	No	Offer E	Month-to-Month	58	Female	19.3
Yes	Yes	No	Offer E	Month-to-Month	59	Male	18.95

Result 134

By placing No in front of the where clause for Churn Label the data presented seems to align with the above analysis of Offers. See below.

```
39      where Churn_Label = "No"
40      Order By cs.Monthly_Charge desc
41      Limit 5;
42
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Churn_Label	phone_service	Internet_Service	offer	Contract	Age	Gender	Avg_Monthly_Charges
No	Yes	Yes	None	Two Year	33	Female	118.75
No	Yes	Yes	Offer A	Two Year	58	Female	118.65
No	Yes	Yes	Offer A	Two Year	27	Female	118.6
No	Yes	Yes	Offer B	One Year	25	Female	118.6
No	Yes	Yes	None	Two Year	60	Male	118.2

Result 136

Prescriptive Analysis

Therefore it can be concluded that based on contract type, personalized offers of 1 or 2 years i.e. multi years would be more suited to the customers especially under and above 30 for both genders. However senior citizens who might have a month on month approach could be offered their basic internet and phone service needs. Moreover, Offer A and Offer B seem to have the highest staying or joining customers which shows Offer A and B seem to have potential to retain customers if deployed correctly.

As a customer retention specialist with a nag for analysis one needs to be empathetic and put oneself in the customer's shoes. Hence, personalized offers would mean offering only what the customer requires. Like, if the customer does not need the phone service no need to include that in the offer and vice versa. For the multi-year offers discounts should be offered like a 5% discount on the multi-year renewal. The extra-long distance calls should be offered to senior citizens who might want to converse with their loved ones over phone. Similarly, under 30 could be offer unlimited data or extra data/GB's for the internet services. Tech premium support could be added only as per need basis but it is likely that the senior citizens require more support. For those above 30 and below the senior citizen category online security and online back-up could be offered since they may require those for their professional needs. Multiple Lines could be offered to B2B customers like organizations or even households as per need. In addition, internet service offers need to be bifurcated further on basis of the internet service type like fiber optic, DSL and cable as per the requirements of the customers.

Based on the above it can be seen that with a little bit of tweaking to the rates by offering combo deals or discounts monthly subscription rates or annual or multi year subscription rates could all

be managed by tailoring the offers to the age, gender and contract needs of the customers since both internet and phone services have kind of an inelastic demand.

Query 2

What are the feedback or complaints from those churned customers?

Query Executed

```
SELECT
    css.Churn_Label,
    css.Churn_Category,
    css.Churn_Reason,
    cs.phone_service,
    cs.Internet_Service,
    cs.offer,
    cs.Contract,
    cd.Age,
    cd.Gender,
    cs.Monthly_Charge AS Avg_Monthly_Charges
FROM
    customer_churn_services cs
        JOIN
    customer_churn_status css ON css.Customer_ID = cs.Customer_ID
        JOIN
    customer_churn_demographics cd ON cd.Customer_ID = css.Customer_ID
WHERE
    Churn_Label = 'Yes'
ORDER BY cs.Monthly_Charge DESC
```

LIMIT 5;

Churn_Label	Churn_Category	Churn_Reason	phone_service	Internet_Service	offer	Contract	Age	Gender	Avg_Monthly_Charges
Yes	Competitor	Competitor had better devices	Yes	Yes	None	One Year	53	Male	118.35
Yes	Competitor	Competitor offered higher download speeds	Yes	Yes	None	One Year	31	Male	117.8
Yes	Competitor	Competitor offered more data	Yes	Yes	None	Month-to-Month	76	Female	117.45
Yes	Other	Don't know	Yes	Yes	Offer A	Two Year	25	Male	116.2
Yes	Dissatisfaction	Product dissatisfaction	Yes	Yes	Offer A	One Year	51	Male	115.65

Query Explanation

Only Churn Category and Churn Reason Fields were added to the query. The executed query goes to show that 3 of the top 5 churned customers suggested that competitor's had something better to offer like better devices, higher speed downloads and more data. Similarly, one customer seems not to have responded whereas another was dissatisfied with the product itself.

Query 3

How does the payment method influence churn behavior?

Query Execution

Query for Churned Customers by Payment Method

```
SELECT
    css.Payment_Method,
    COUNT(cs.Customer_ID) AS Customers_Churned
FROM
    customer_churn_services css
JOIN
    customer_churn_status cs ON cs.Customer_ID = css.Customer_ID
WHERE
    cs.Customer_Status = 'Churned'
GROUP BY
    css.Payment_Method;
```

	Payment_Method	Customers_Churned
▶	Bank Withdrawal	1329
	Credit Card	398
	Mailed Check	142

Query for Retained Customers By Payment Method

```
SELECT

    css.Payment_Method,

    COUNT(cs.Customer_ID) AS Customers_Retained

FROM

    customer_churn_services css

JOIN

    customer_churn_status cs ON cs.Customer_ID = css.Customer_ID

WHERE

    cs.Customer_Status = 'Stayed'

GROUP BY

    css.Payment_Method;
```

	Payment_Method	Customers_Retained
▶	Credit Card	2120
	Bank Withdrawal	2399
	Mailed Check	201

Query for Customers Joined By Payment Method

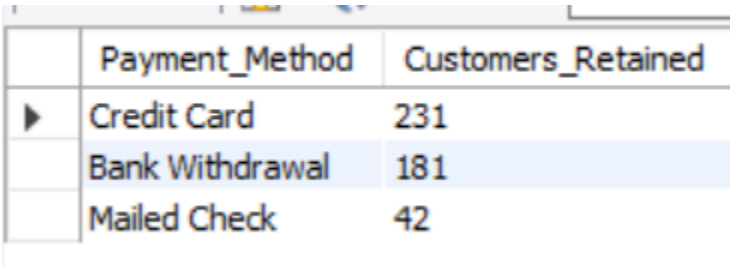
```
SELECT

    css.Payment_Method,

    COUNT(cs.Customer_ID) AS Customers_Retained

FROM
```

```
    customer_churn_services css
JOIN
    customer_churn_status cs ON cs.Customer_ID = css.Customer_ID
WHERE
    cs.Customer_Status = 'Joined'
GROUP BY
    css.Payment_Method;
```



Payment_Method	Customers_Retained
Credit Card	231
Bank Withdrawal	181
Mailed Check	42

Queries Explanation

Customers who churned using the Bank Withdrawal payment method were 1329 in total which was the highest number of churned customers amongst the 3 payment methods. However, 2399 customers stayed as well who were paying via Bank Withdrawal. 181 customers who subscribed to the Telco's services opted for Bank Withdrawal payment method.

On the other hand 231 customers who subscribed/joined to the Telco's services opted for Credit Card payment method. 2120 customers stayed and 398 churned.

Only 142 customers paying through mailed check churned. 201 stayed and 42 customers who joined opted for Mailed Check payment method.

Whatsoever the dynamics are, the personalized offers could tackle the churning issue across all payment methods by improving on the collections and billing strategy like proper invoicing, quote generation as well as offering special net payment terms like 45 net payment terms or even 60 in cases where the customer is a loyal customer for instance on a 2 year renewal.

References

Link to my Medium Article

https://medium.com/@asadr6240/analyzing-customer-churn-in-a-fictional-telco-company-insights-and-strategies-13f0b29aaa54

BANK CHURN ERD - Miro

IBM telco customer churn dataset.xlsx - Google Sheets