

Case Study: Analyzing Customer Churn in Power BI

Introduction

A telecom provider Databel is complaining that the churn rate has been increasing lately. The churn rate, or the rate of attrition or customer churn, is when customers stop doing business with an entity. Your overall revenue will stay the same or even reduce if existing customers leave your company. The challenge is not only to know the churn rate but more important - to understand why the customers are leaving and reduce the rate.

Dataset Description:

Customer Status	
Customer ID	The unique ID that identifies a customer.
Churn Label	Contains "Yes" or "No" to indicate if a customer churned.
Churn Reason	The particular reason why the customer ended the contract.
Churn Category	Groups multiple churn reasons together for analysis purposes.
Demographics	
Contract Type	Contains "Month to Month", "One Year" or "Two Year".
Payment Method	The preferred payment method of the customer indicated "Credit Card", "Direct Debit" or "Paper Check".
State	The code of the state where the customer lives.
Phone Number	Phone number of the customer
Group	Indicates if the customer is part of a group contract. A group contract offers advantages and is generally cheaper. Contains "Yes" or "No".
Number of customers in a group	The number of customers part of the group.
Subscription Types and Charges	
Account Length (in months):	The number of months the customer has

	been with Databel.
Local Calls	Amount of local (within the US) calls from the customer
Intl Calls	Amount of international (outside the US) calls from the customer.
Intl Mins	The number of minutes spent calling internationally. Intl Active: Indicates if the customer called internationally with a “Yes” or “No”.
Intl Plan	Indicates if the customer has a premium plan to call internationally for free with “Yes” or “No. This premium is reflected in the amount of the monthly charge.
Extra International Charges	Contains extra charges for international calls for customers who are not on an international plan.
Customer Service Calls	The number of calls made to customer service.
Avg Monthly GB Download	Contains the average monthly download volume in gigabytes
Unlimited Data Plan	Indicates if the customer has free unlimited download capacity with “Yes” or “No”. This premium is reflected in the amount of the monthly charge
Extra Data Charges	Contains extra charges for data downloads for customers who are not on an unlimited plan.
Monthly Charges	Average of all Monthly Charges to the customer.
Total Charges:	The sum of all monthly charges.

Used Tools:

Power BI

Step 1: Data Check

For a better understanding of our dataset, we create two measures Count of Customers and Count of Unique Customers to see if they correlate.

6687

Number of Customers

6687

Number of Unique Customers

Step 2: Calculate the churn rate

We have a column named Churn Level that indicates Yes or No. But this column is not the easiest to work with. We will convert this column to a binomial displaying whether the customer churned. We will need this for calculating the churn. For that, we create a column that contains 1 if a customer churned, and 0 in case customers didn't churn.

```
Churned = IF('Databel - Data'[Churn Label] = "Yes", 1, 0)
```

1. On the new page, we calculate the Churn Rate using the new measures.

```
Churn Rate = DIVIDE([Number of Churned Customers], [Number of Customers])
```

It is 26.86%.

26,86%

Churn Rate

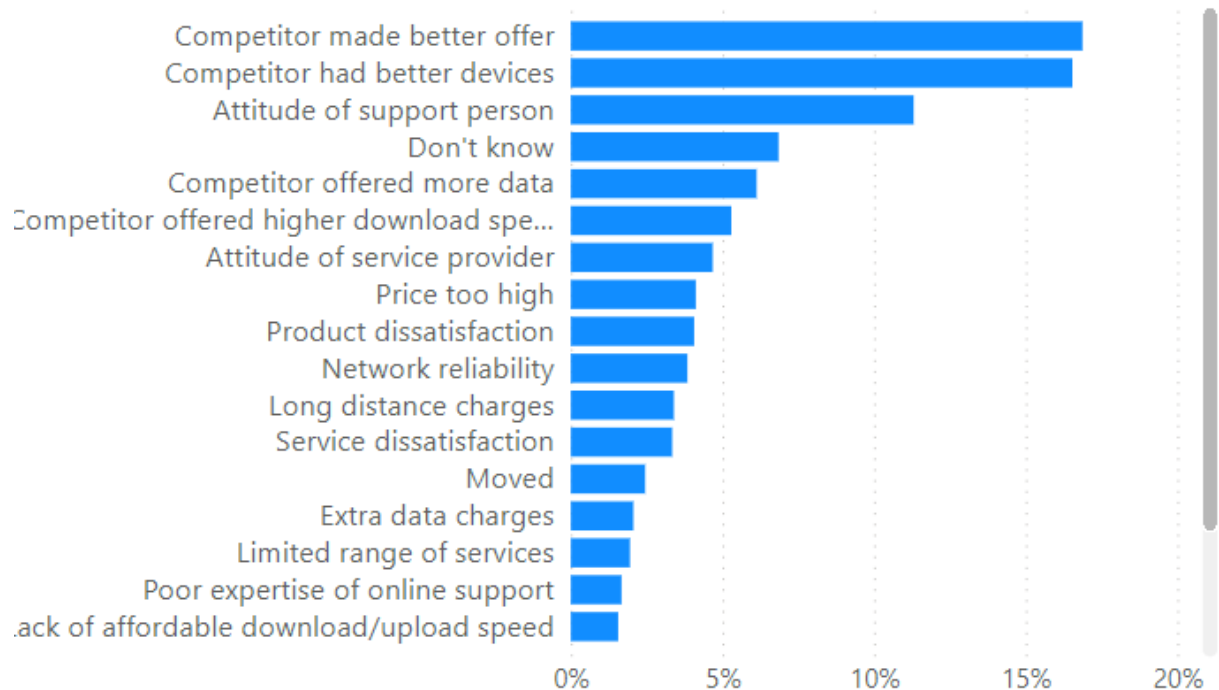
1796

Sum of Churned

Step 3: Knowing the Reason

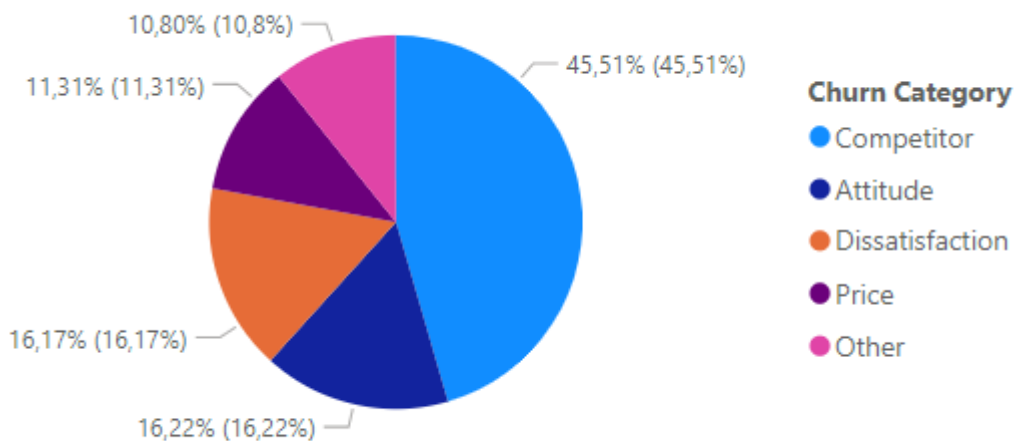
The logical next step is to investigate the different reasons why customers churned. For that, we are creating a column chart listing the reasons.

Churn Reasons



For a better representation let's display all churn categories in one clear visualization.

Churn Label by Category



We can clearly see that most reasons are connected to the competitors as well as with the customer support service.

By creating a map visualization to investigate a churn rate by state, we can see there are some particular states showing an abnormally high churn rate, like California.

hurn Rate by State and Intl Plan



So far, our key insights would be the following:

- The churn rate is about 27%;
- The main reason is related to competitors;
- The churn rate in California is abnormally high.

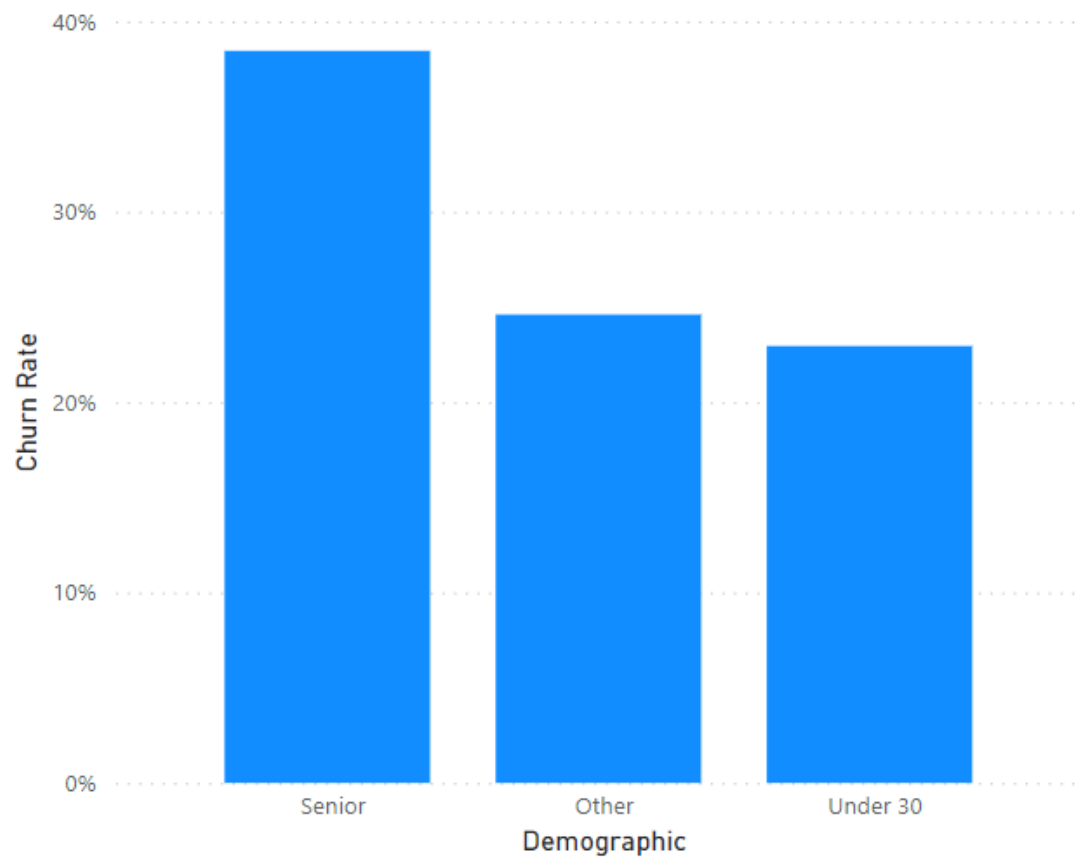
Step 4: Diving More Deeply into the Demographic

We are going to dive more deeply into the existing columns of the database to understand the churn patterns more. Firstly, let's categorize the demographic column using variables related to age to visualize.

```
Demographic = IF('Databel - Data'[Age]>=65, "Senior", IF('Databel - Data'[Age]<=30, "Under 30", "Other"))
```

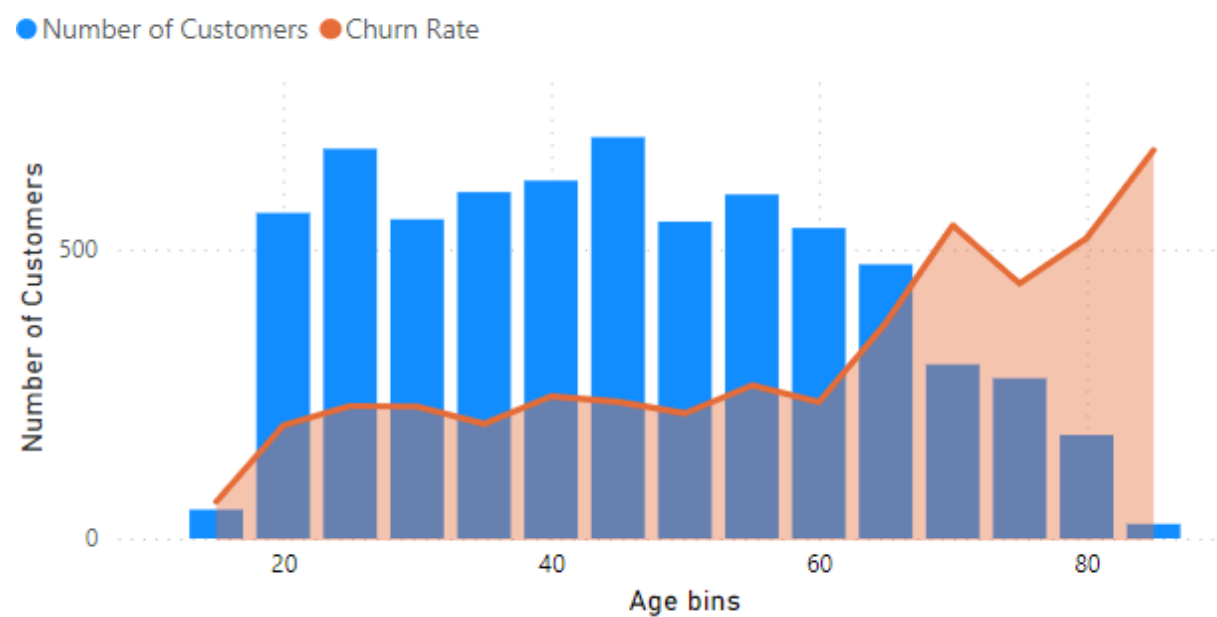
We can see now that the churn rate for senior citizens is much higher than other age groups.

Churn Rate no Demographic



If we create different age bins to get to know the churn patterns connected to age we can see this pattern clearly.

Number of Customers and Churn Rate by Age (bins)



Step 5: Analyzing the Contract Details

- Group Plans

If we look precisely at the customers who have the group packages, it would be clear that clients in a group of 2 and more have a significantly lower monthly charge.

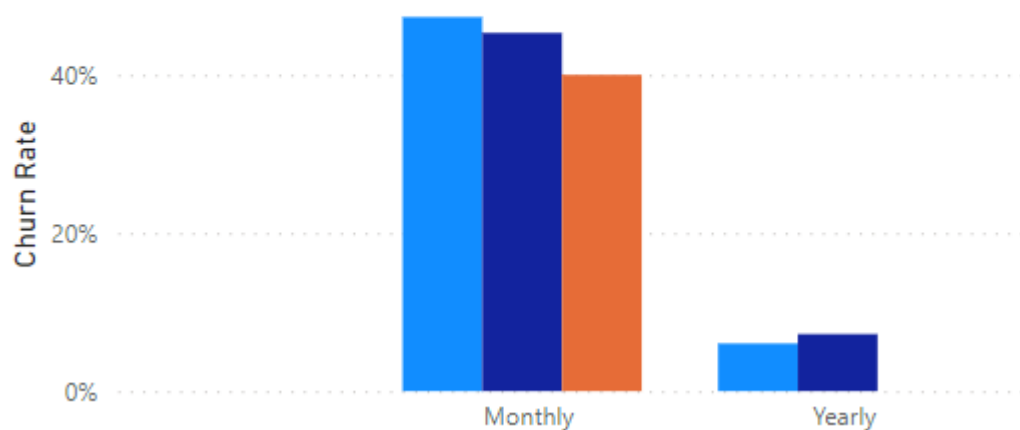


- Contract Details

If we analyze the customers with different contracts - “One Year”, “Two Years”, and “Month-to-Month” and observe the difference between their behavior patterns, we can see a clear trend for churning in the client group who have monthly contracts.

Churn Rate by Gender and Contract Category

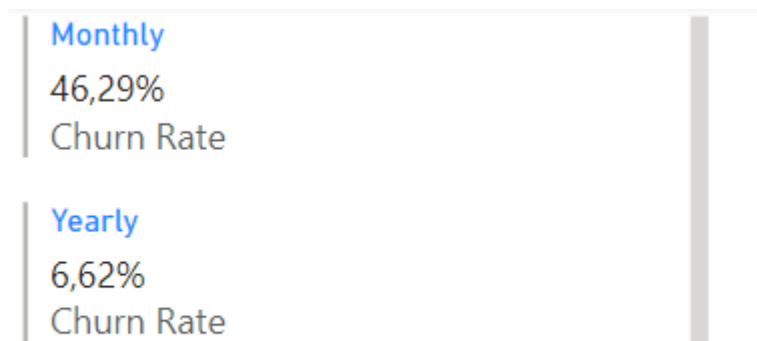
Gender: Female (Blue), Male (Dark Blue), Prefer not to say (Orange)



For that, we categorize the customer's contacts into two types - "Yearly" and "Monthly" - using the function SWITCH. The DAX will be the following:

```
Contract Category = SWITCH('Databel - Data'[Contract Type], "One Year", "Yearly", "Two year", "Yearly", "Month-to-Month", "Monthly")
```

A vast difference in the churn rate could be noticed: 46,29% for monthly contracts and 6,62% for yearly contracts.



- Data Consumption

Let's also observe a hypothesis that customers who are not on the unlimited plan are more likely to churn.

Churn Rate	Unlimited Data Plan
16,10%	No
32,11%	Yes
26,86%	

We can see, that those having an unlimited data plan would be twice more likely to churn than those who don't have this contract.

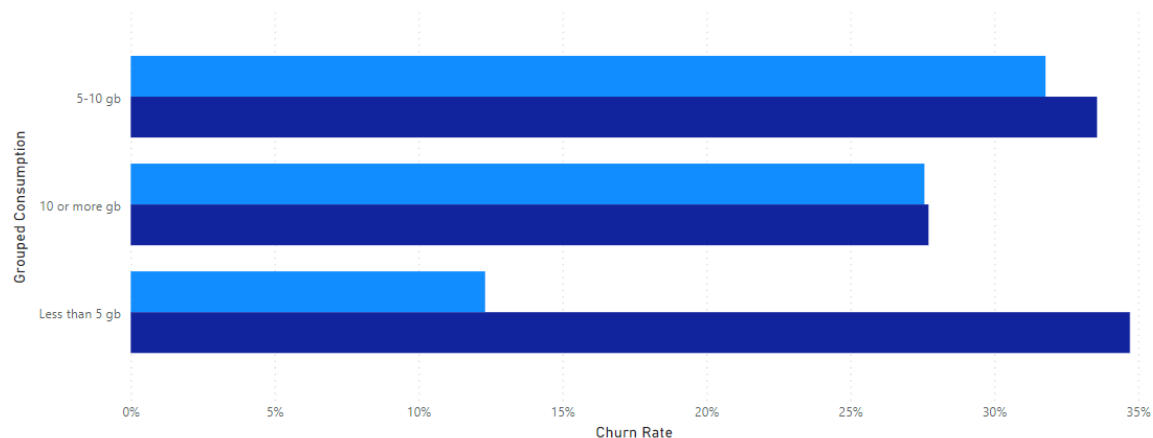
Furthermore, if we are willing to see the churn correlation to the amount of GB being used, let's create a new column Grouped Consumption that classifies the consumption into three categories: less than 5 GB, 5-10 GB, and 10+ GB. For that, we would use an IF function.

```
Grouped Consumption = IF('Databel - Data'[Avg Monthly GB Download]<5, "Less than 5 gb", IF('Databel - Data'[Avg Monthly GB Download] < 10, "5-10 gb", "10 or more gb"))
```

And after that, let's visualize it using the clustered bar chart

Churn Rate by Unlimited Data Plan and Grouped Consumption

Unlimited Data Plan ● No ● Yes



We can see a significantly higher churn rate for customers on the unlimited data plan with little consumption - 5 GB and less.

Most probably, the clients using a little amount of GB are needed to be advised to change the data plan for a more suitable one for their amount of data consumption.

- International Activity

For analyzing the international activity of the customers (those ones who make international phone calls).

Churn rate by Intl Plan and Intl Activity

Intl Plan	No	Yes
yes	71,19%	7,59%
no	20,01%	40,34%

We can see that those on the international plan and not making international calls are more likely to churn. Thus, they are needed to be advised on a more suitable plan which does not include international calls.

Step 5: Customer Service

So far, it is getting pretty obvious that a lot of customers are needed to be advised on the plan changes. In addition to that, customer service-related reasons were at the top of the list for churn. So, let's see how the customer service is doing.

By looking at the payment methods and account length, we can see an especially high number of customer calls for debit cards and monthly contract categories. This is definitely needed to be addressed. Furthermore, the ones who call customer service are the ones who churn more frequently. Relatively, there might be some problems with the payment methods as well as with the customer service in general.

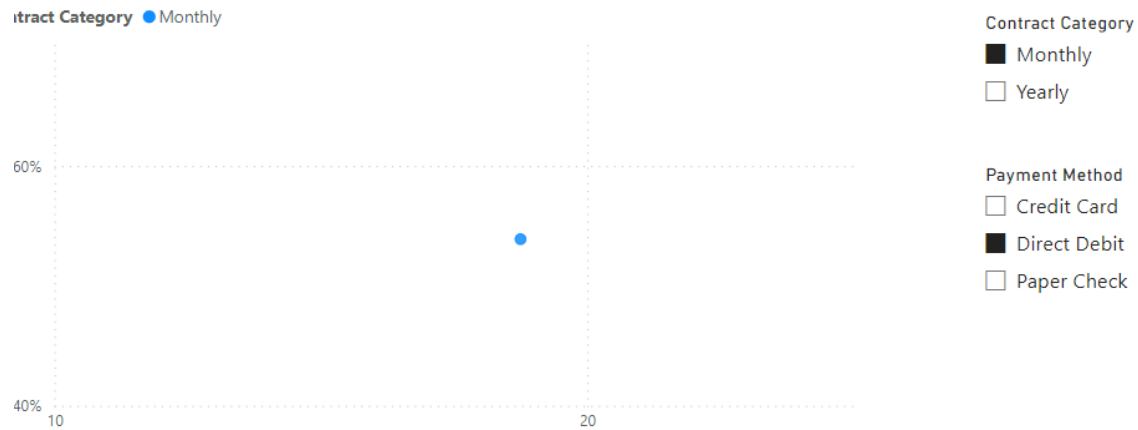
3112

Sum of Customer Service Calls

1,47

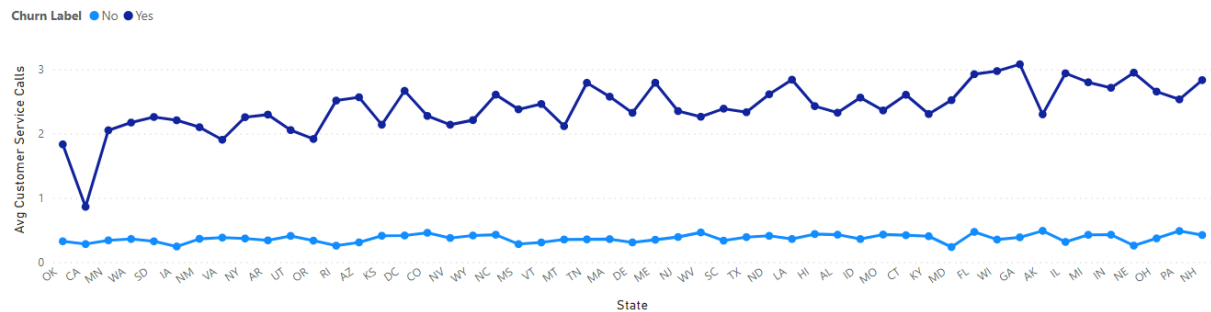
Avg Customer Service Calls

Churn Rate by Account Length (in months)



By visualizing the data, we can clearly see that the churned customers made the most of the customer service calls.

Avg Customer Service Calls by State and Churn Label



Main insights

- The most reasons for churning are connected to the competitors as well as the customer support service;
- There are some particular states showing an abnormally high churn rate like California;
- The churn rate for senior citizens is much higher than for other age groups;
- A clear trend for churning in the client group who have monthly contracts rather than those who have a yearly contract;
- Those having an unlimited data plan would be twice more likely to churn than those who don't have this contract;
- Customers on the international plan and not making international calls are more likely to churn;

- An especially high number of customer calls for debit cards and monthly contract categories;
- Those who call customer service are more likely to churn afterward.

Recommendations

- Improve customer support service: Since customer support is one of the most significant reasons for churning, the company should focus on improving the quality of its customer support service. The company should invest in training customer support representatives to be more empathetic, knowledgeable, and efficient in resolving customer issues.
- Analyze competitors' offers: As the competition is a significant reason for churning, the company should conduct a competitive analysis to understand what competitors are offering and how they can improve their offers to match or exceed those of their competitors. The company can also consider offering loyalty programs or special deals to retain existing customers.
- Address churn in California: The company should develop targeted marketing campaigns or offers to retain customers in this state.
- Focus on senior citizens: Since senior citizens have a much higher churn rate than other age groups, the company should develop targeted marketing campaigns to retain this group of customers.
- Encourage yearly contracts: Since customers with monthly contracts are more likely to churn, the company should encourage customers to sign up for yearly contracts by offering incentives such as discounts, additional data or minutes, or other perks.
- Re-evaluate unlimited data plan: Since customers with an unlimited data plan are twice as likely to churn, the company should evaluate whether this plan is profitable and consider adjusting it or offering alternative plans that better suit customers' needs.
- Improve the international plan: Since customers on the international plan who do not make international calls are more likely to churn, the company should make improvements to the international plan or offer alternative plans.
- Address frequent customer calls: Since there are high numbers of customer calls for debit cards, the company should check out this payment method.