

# **Bank Churn Analysis**

**Microsoft Power BI Project**

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Row-Level Security

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Mobile Layout

# Company:

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Equality Bank is the one of the largest private bank in Europe. It provides financial and banking services to their customers.

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It offers retail, corporate, international banking with different products and services like savings, credit cards, equities trading, loans, wealth management, investment management.

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There are 4000 branches and offices across 65 countries with serving 40 million clients.

# Objective:

- To understand the database of the bank customers from year 2016 to 2019 by analyzing their credit history, age, geography etc. , so that customers retention percentage and customer base increases with providing new promotional offers, products and services.

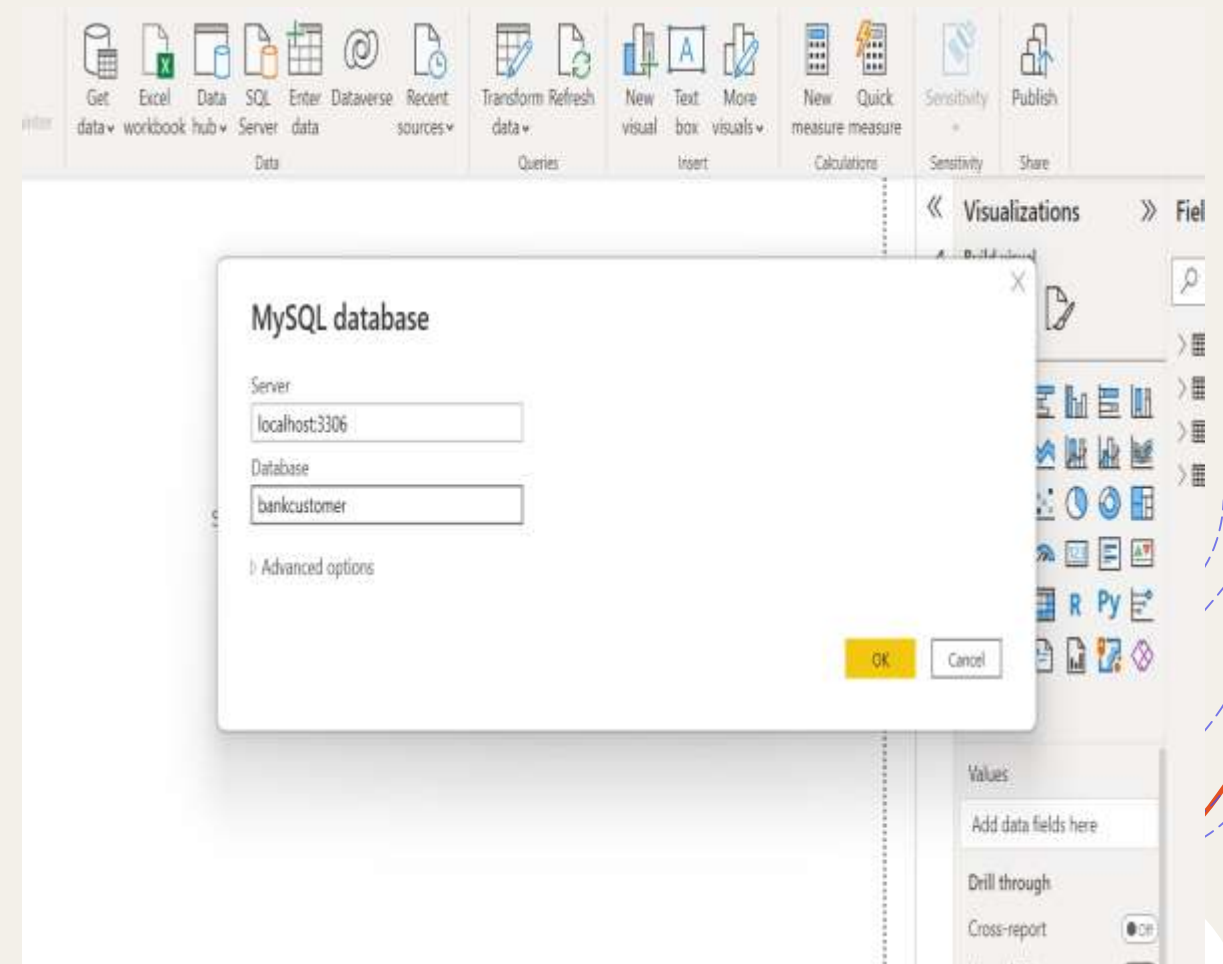
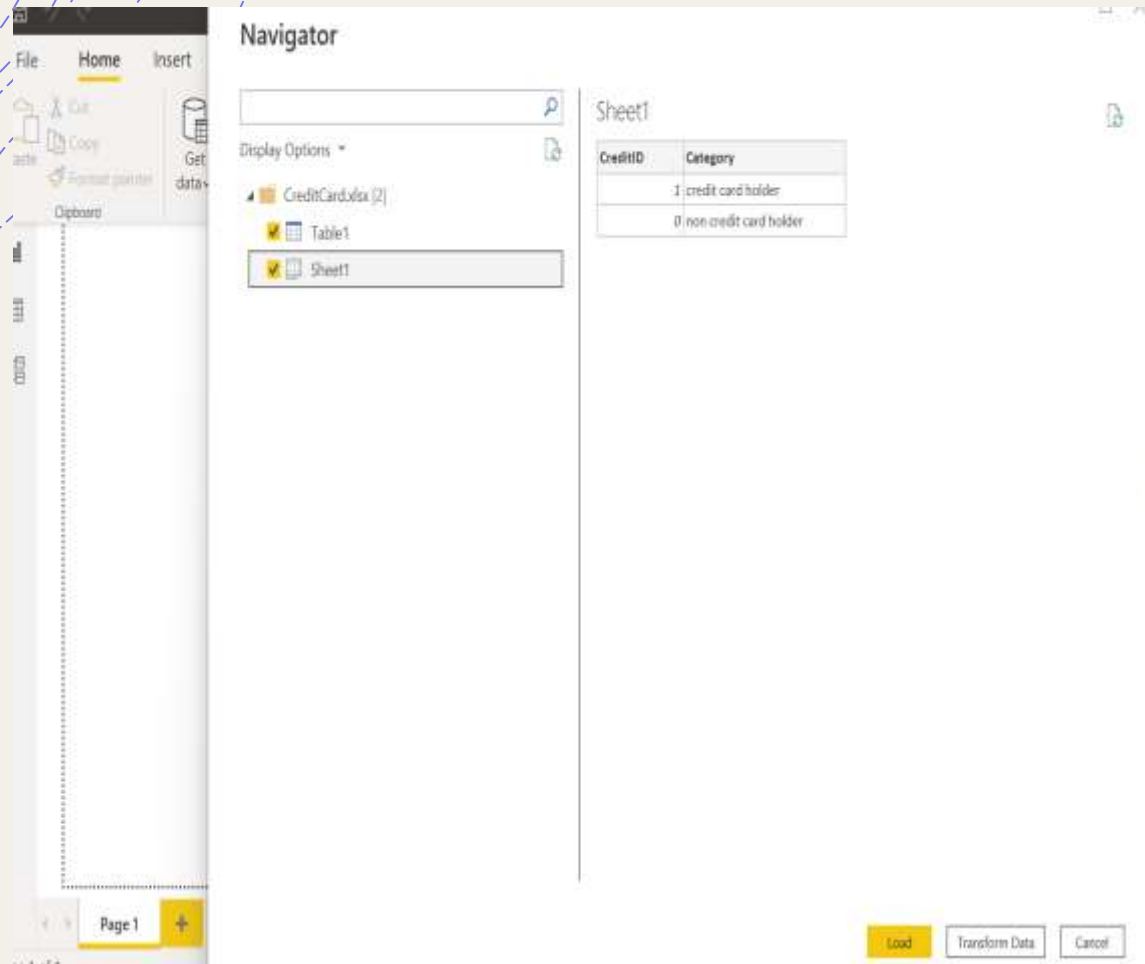
# Stakeholders:

- Employees
- Customers
- Product development Team
- Data Analytics Team
- Software Development Team

# Data Gathering :

Extracted the database from various like Excel and MySQL data sources into the Microsoft Power BI

- Made a connection on MySQL workbench and import the data.
- Performed data analysis to understand the data by using SQL queries.



# Data Cleaning:

Table.TransformColumnTypes(#"Filtered Rows",{"Bank DOJ", type date})

1	2	3	4	5	6
IsActiveMember	EstimatedSalary	Exited	Bank DOJ		
1	101348.88	1	Error		
0	112542.58	0	Error		2018-09-10
1	113031.97	1	Error		
0	93826.63	0	Error		
1	79084.1	0	Error		
1	149756.71	1	Error		
1	10062.8	0	Error		
1	119346.88	1	Error		
0	74940.5	0	Error		2018-04-02
1	71725.73	0	Error		
0	80181.12	0	Error		
1	76390.01	0	Error		2016-12-09
1	26260.98	0	Error		2019-04-11
0	190857.79	0	Error		
1	65951.65	0	Error		
0	64322.26	0	Error		
1	5097.67	1	Error		2018-08-10
1	14406.41	0	Error		2019-09-10
0	258684.81	0	Error		
1	54724.03	0	Error		

Transform the data into the Power Query editor and understand the data.

- Data profiling : Remove errors & duplicates, understanding of Distinct rows.
- Changed Data type
- Used First row as headers

## Major Issues & Solutions :

Issue : In Power Query editor, there was an error in Date data type.

Solution: Went to the options, changes the regional setting into the corrected data type format.

Issue : Unnecessary Information

Solution : Removed the Index column

Formula Bar: = Source[{"Schema": "bankcustomer", "Item": "churn"}][Data]

Layout: Data Preview, Columns, Parameters, Advanced, Query Dependencies

1	2	3	4	5
CustomerId	Surname	CreditScore	Geography	Gender
1	15634602 Hargrave	619	France	Female
2	15647313 Hill	608	Spain	Female
3	15619304 Onio	502	France	Female
4	15701354 Boni	699	France	Female
5	15737888 Mitchell	850	Spain	Female
6	15574012 Chu	643	Spain	Male
7	15592531 Bartlett	822	France	Male
8	15656148 Olbina	370	Germany	Female
9	15702363 He	501	France	Male
10	15582189 H?	684	France	Male
11	15767823 Beance	328	France	Male
12	15737173 Andrews	497	Spain	Male
13	15632264 Kay	476	France	Female
14	15691483 Chin	549	France	Female
15	15608882 Scott	635	Spain	Female
16	15643966 Goforth	616	Germany	Male
17				



# Data Transformation:

The screenshot displays the Microsoft Excel interface with the 'Table tools' and 'Column tools' tabs active. The 'Date' column is selected, and the 'Format' dropdown is set to '\*2001-03-14 1:30:55'. The 'Summarization' dropdown is set to 'Don't summarize'. The 'DateMaster' table is visible, showing a list of dates from 2016-01-01 to 2016-01-20. The 'Date' column is highlighted, and the 'Format' dropdown is open, showing various date and time formats.

Date	Year	Month	Day	Hour	Minute	Second
2016-01-01 12:00:00 AM	2016	1	1	12	00	00
2016-01-02 12:00:00 AM	2016	1	2	12	00	00
2016-01-03 12:00:00 AM	2016	1	3	12	00	00
2016-01-04 12:00:00 AM	2016	1	4	12	00	00
2016-01-05 12:00:00 AM	2016	1	5	12	00	00
2016-01-06 12:00:00 AM	2016	1	6	12	00	00
2016-01-07 12:00:00 AM	2016	1	7	12	00	00
2016-01-08 12:00:00 AM	2016	1	8	12	00	00
2016-01-09 12:00:00 AM	2016	1	9	12	00	00
2016-01-10 12:00:00 AM	2016	1	10	12	00	00
2016-01-11 12:00:00 AM	2016	1	11	12	00	00
2016-01-12 12:00:00 AM	2016	1	12	12	00	00
2016-01-13 12:00:00 AM	2016	1	13	12	00	00
2016-01-14 12:00:00 AM	2016	1	14	12	00	00
2016-01-15 12:00:00 AM	2016	1	15	12	00	00
2016-01-16 12:00:00 AM	2016	1	16	12	00	00
2016-01-17 12:00:00 AM	2016	1	17	12	00	00
2016-01-18 12:00:00 AM	2016	1	18	12	00	00
2016-01-19 12:00:00 AM	2016	1	19	12	00	00
2016-01-20 12:00:00 AM	2016	1	20	12	00	00

Common formats

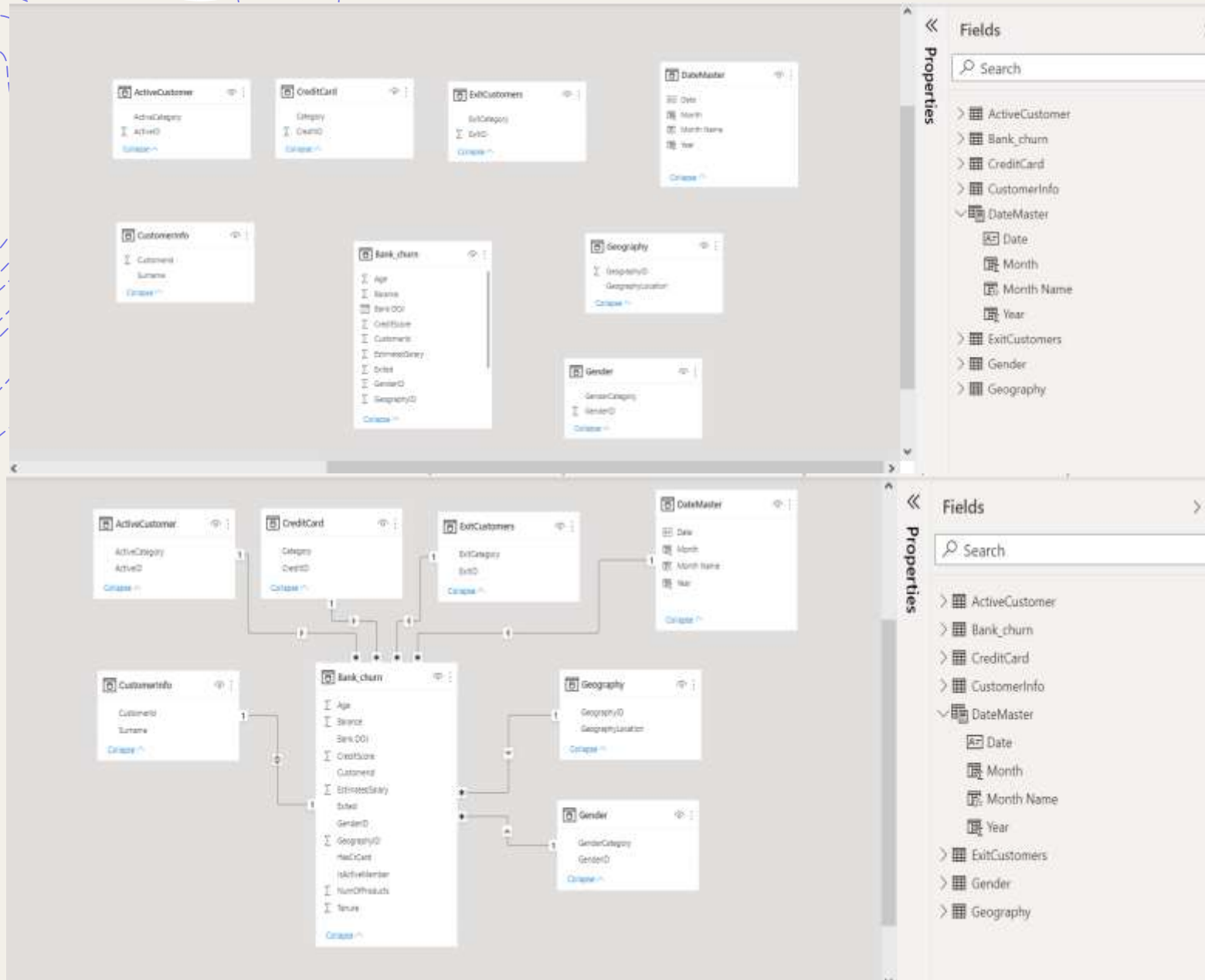
- \*2001-03-14 1:30:55 PM (General Date)
- \*2001-03-14 (Short Date)
- \*March 14, 2001 (Long Date)
- \*1:30 PM (Short Time)
- \*1:30:55 PM (Long Time)
- 14-03-2001 (dd/mm/yyyy)
- 2001-03-14 13:30:55 (yyyy-mm-dd hh:nn:ss)
- 2001-03-14 (yyyy-mm-dd)
- 2001-03 (yyyy-mm)

Date formats

- March 14, 2001 (mmmm d, yyyy)
- Wednesday, March 14, 2001 (dddd, mmmm dd, yyyy)
- March-14-01 (mmmm-dd-yy)
- 14-Mar-01 (d-mmm-yy)
- 14-03-01 (dd/mm/yy)
- 14-3-01 (d/m/yy)
- 01-03-14 (yy-mm-dd)
- 3-14-01 (m/dd/yy)

- Created the DateMaster Table and split out the date, month, year and month name to eliminate the complexity.
- DateMaster  
=CALENDAR(FIRSTDATE(Bank\_churn[Ba  
nk DOJ]), LASTDATE(Bank\_churn[Ba  
nk DOJ]))
- Year = Year(DateMaster[Date])
- Month = MONTH(DateMaster[Date])
- Month Name =  
FORMAT(DateMaster[Date],"MMMM")

# Data Modeling :



In Data model page:

- Used star schema (One to many, 1: \*) by joining the primary keys to related tables foreign keys.
- Fact table : Bank\_churn
- Lookup tables : Active Customers, Exit customer, DateMaster, Geography, Gender, Customer Info, Credit Card

# DAX Calculations:

D	E	I	J	K	M
GeographyID	GenderID	NumOfProducts	HasCrCard	IsActiveMember	Exited
1	2	1	1	1	1
2	2	1	0	1	0
1	2	3	1	0	1
1	2	2	0	0	0
2	2	1	1	1	0
2	1	2	1	0	1
1	1	2	1	1	0
3	2	4	1	0	1
1	1	2	0	1	0
1	1	1	1	1	0
1	1	2	0	0	0
2	1	2	1	0	0
1	2	2	1	0	0
1	2	2	0	0	0
2	2	2	1	1	0
3	1	2	0	1	0
3	1	1	1	0	1
2	2	2	1	1	0

ActiveID	ActiveCategory
1	Active Member
0	Inactive Member

CreditID	Category
1	credit card holder
0	non credit card holder

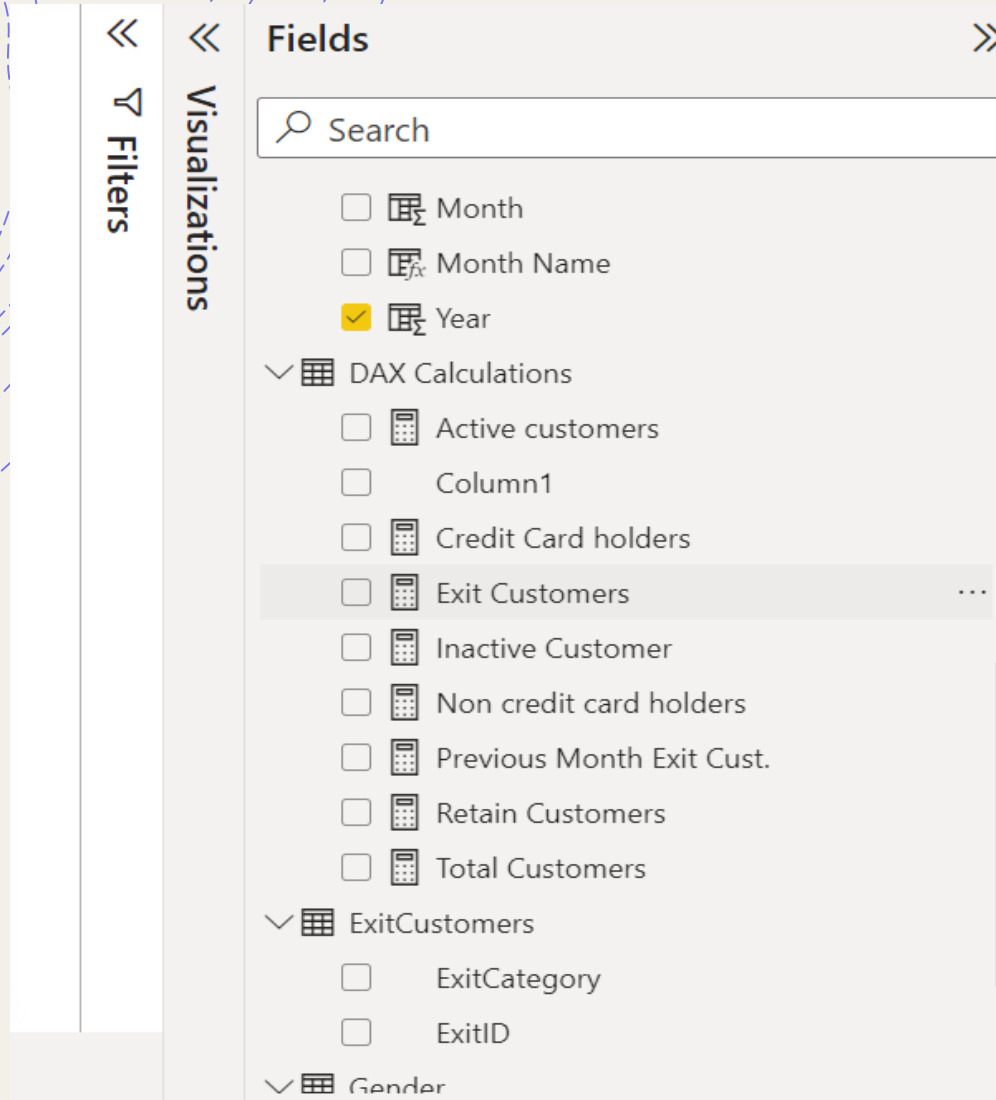
ExitID	ExitCategory
1	Exit
0	Retain

GenderID	GenderCategory
1	Male
2	Female

GeographyID	GeographyLocation
1	France
2	Spain
3	Germany



# DAX Calculations:



Active customers =  
`CALCULATE(count(Bank_churn[CustomerId]),  
ActiveCustomer[ActiveCategory]="Active Member")`

Total Customers = `COUNT(Bank_churn[CustomerId])`

Inactive Customer =  
`CALCULATE(COUNT(Bank_churn[CustomerId]),  
ActiveCustomer[ActiveCategory]="Inactive Member")`

Credit Card holders =  
`CALCULATE(COUNT(Bank_churn[IsActiveMember]),  
CreditCard[Category]="credit card holder")`

Non credit card holders = `[Total Customers]-[Credit Card holders]`

Exit Customers = `CALCULATE(count(Bank_churn[CustomerId]),  
ExitCustomers[ExitCategory]="Exit")`

Retain Customers = `[Total Customers]-[Exit Customers]`

# Reporting & Visualization:

**1. Credit score:** To understand the customer lies in which credit type.

Excellent : 800-850, Very Good : 740-799, Good: 670-739, Fair : 580-669 and Poor : 300-579

credit Range

```
= SWITCH(TRUE(),Bank_churn[CreditScore]>=800 && Bank_churn[CreditScore]<= 850, "Excellent",  
Bank_churn[CreditScore]>=740 && Bank_churn[CreditScore]<= 799, "very good",  
Bank_churn[CreditScore]>=670 && Bank_churn[CreditScore]<= 739, "good",  
Bank_churn[CreditScore]>=580 && Bank_churn[CreditScore]<= 669, "Fair",  
Bank_churn[CreditScore]>=300 && Bank_churn[CreditScore]<= 579, "poor")
```

**2. Age Bin :**

Age Bin

```
= SWITCH(TRUE(),Bank_churn[Age]>= 18 && Bank_churn[Age]<30, "18-29",  
Bank_churn[Age]>= 30 && Bank_churn[Age]<40,"30-39",  
Bank_churn[Age]>= 40 && Bank_churn[Age]<50, "40-49",  
Bank_churn[Age]>= 50 && Bank_churn[Age]<62,"50-61",  
Bank_churn[Age]>= 62 && Bank_churn[Age]<=92,"62-92")
```

**3. Churn Percentage**

Churn % =

var exit = [Exit Customers]

var total = [Total Customers]

var ChurnPercentage = DIVIDE(exit,total)

return ChurnPercentage

# Data Reporting :

## Bank Customer Churn Analysis

2016

2017

2018

2019

Total Customers  
10,000

Retain Customers  
7963

Exit Customers  
2037

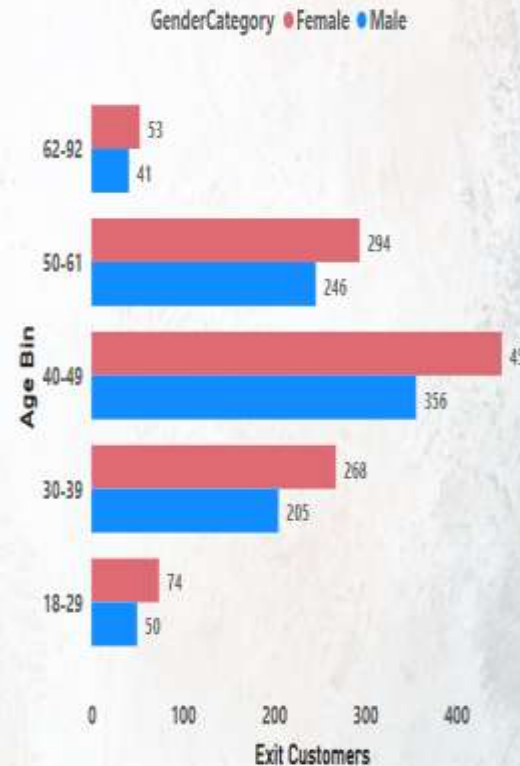
Churn Percentage  
20.37%

Active Customers  
5151

Exit Customers by Credit Range

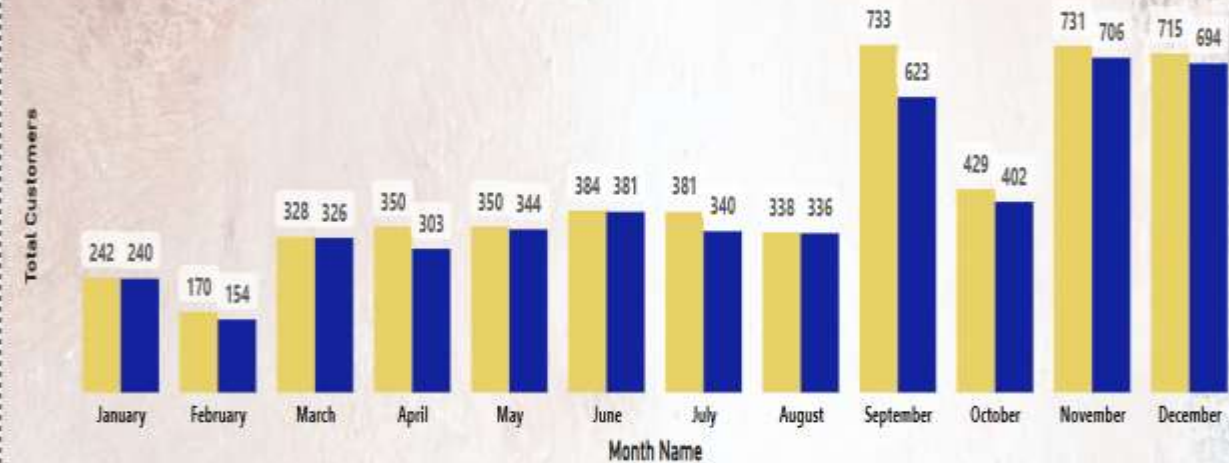


Exit Customers by Age Bin

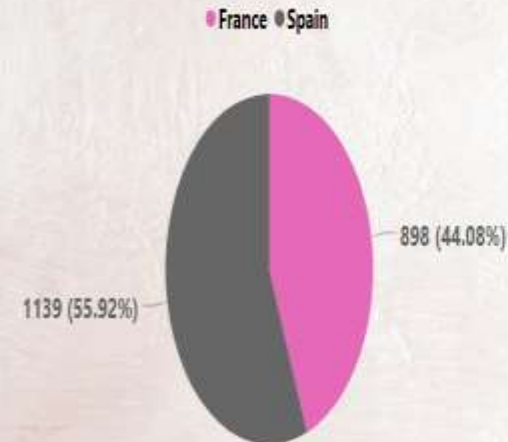


Active & Inactive Customer by Month

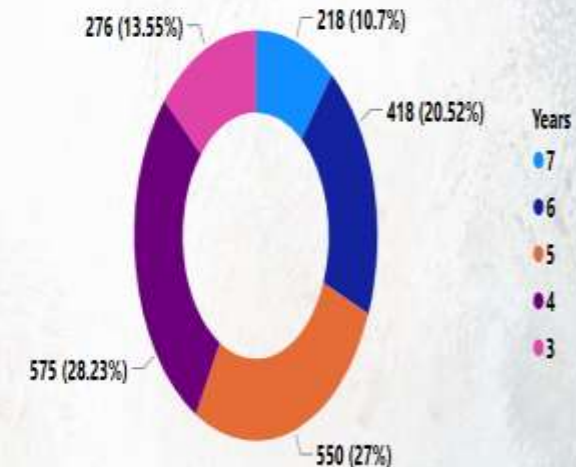
Location ● Active Member ● Inactive Member

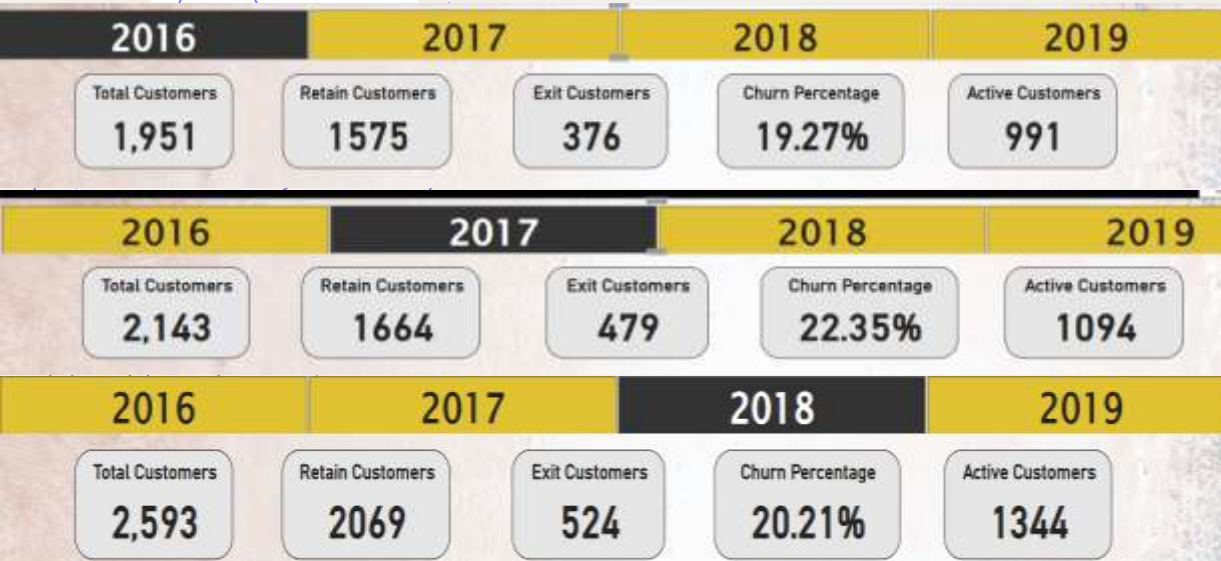


Exit Customers by Location



Exit Customers by Years

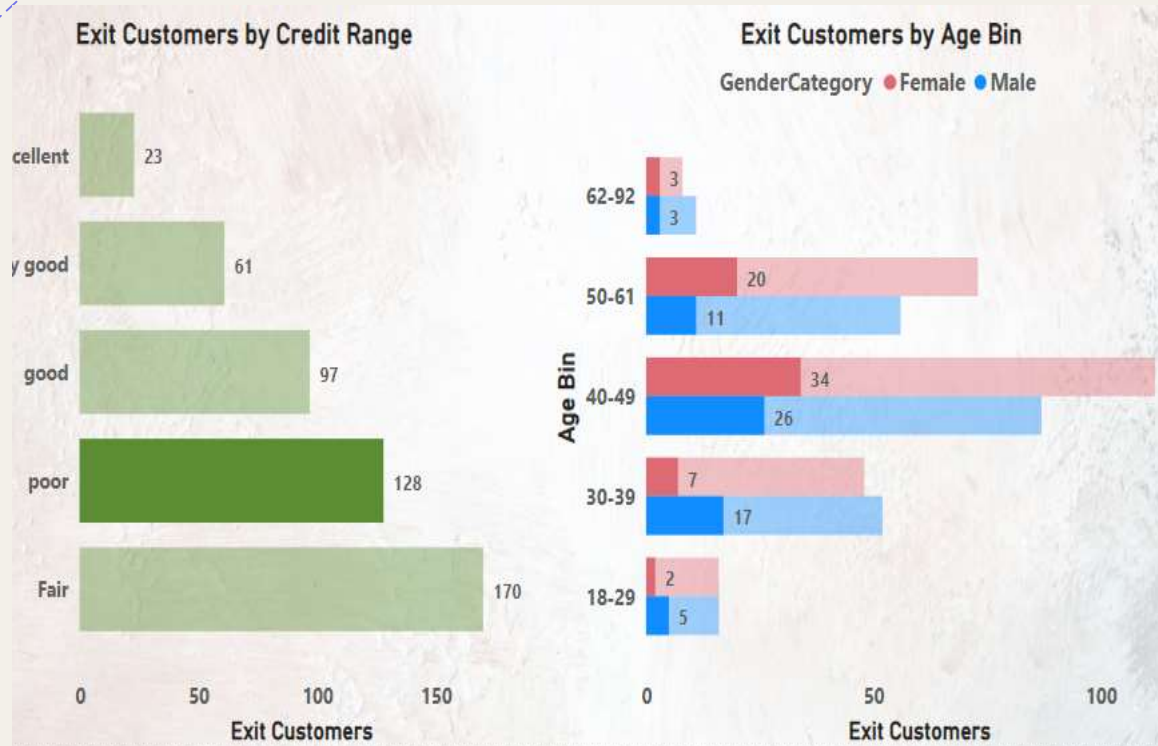




**Analysis 1:** Churn % increases by 13.7 % from 2016 to 2017 and then decreases with

**Problem:** Increase in percentage of leaving bank Customers year by year.

**Solution:** Focusing on Quality of banking products & services rather than increasing the customer base.



**Analysis 2:** In 2016, exited customer which lies under “Poor” credit range were comes under the age range of 40-49.

Females = 34

Males = 26

Total = 60 Customers

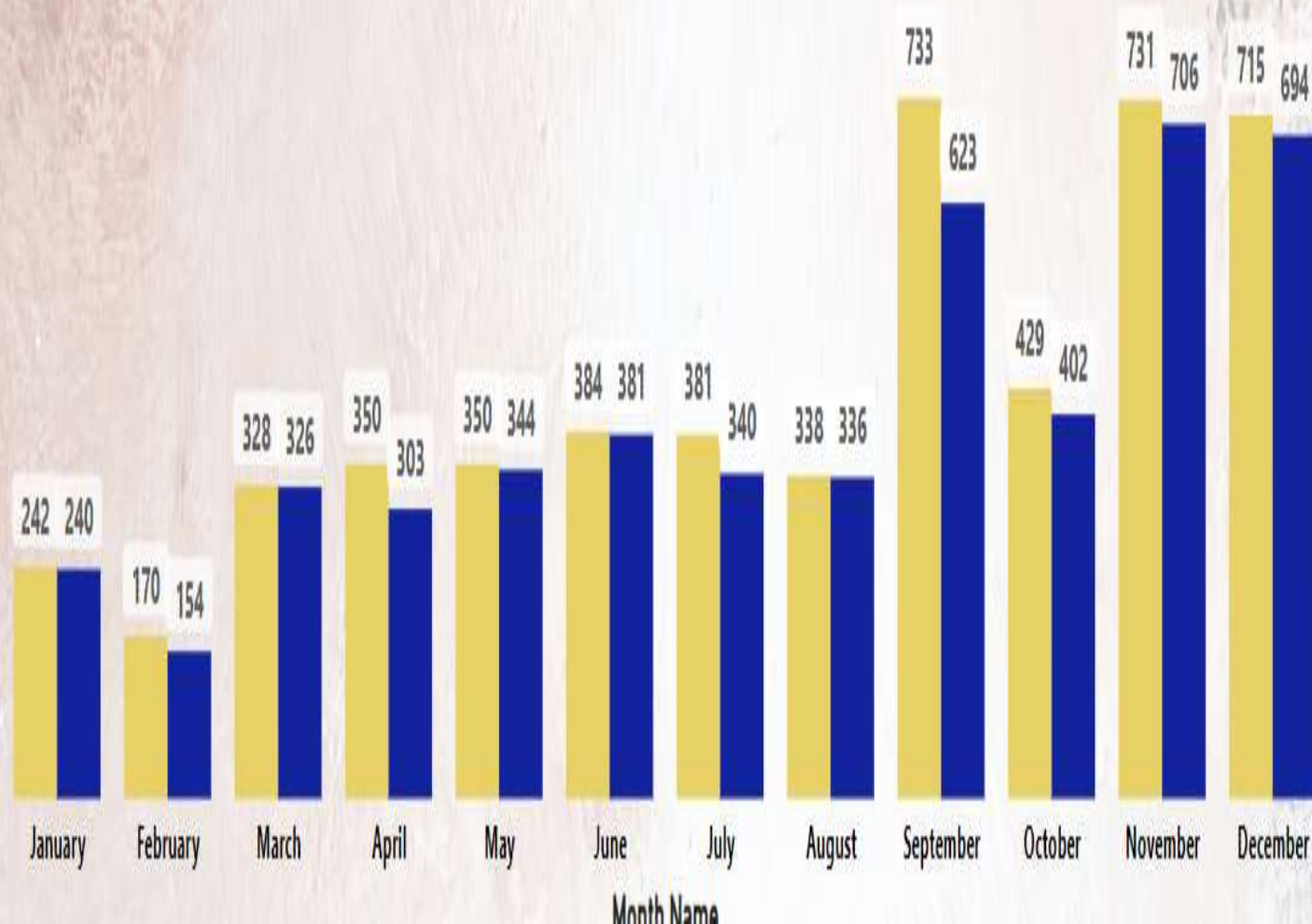
**Problem:** Majority of chances that active customer lies under 40-49 age leaves the bank because of poor credit score.

**Solution:** Bank can provide new products or promotional offers to active customers to retain and while using any product increase credit score.



## Active &amp; Inactive Customer by Month

Location ● Active Member ● Inactive Member

**Analysis 3:**

*Active Customers* : Involved in Banking Products.

*Inactive Customer*: Not involved in Banking Products.

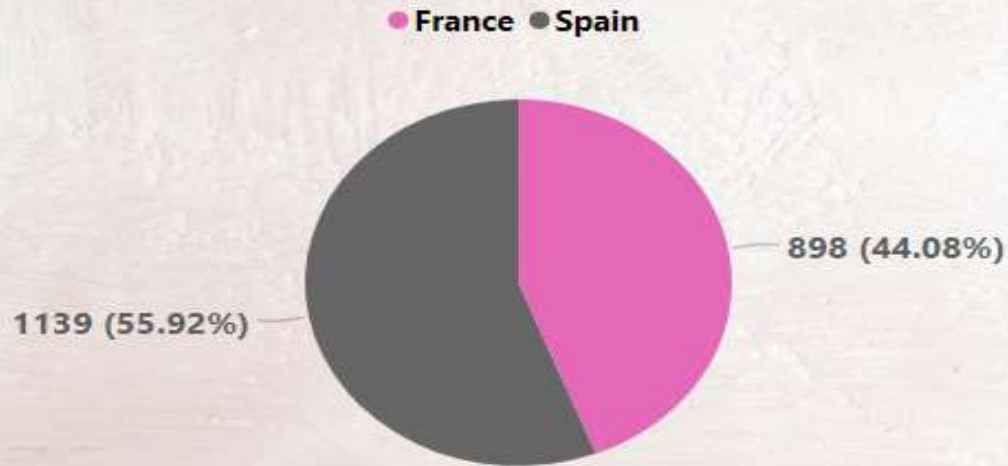
Month-wise Customer base are increasing but in same case active and inactive figures also increasing and both figures are almost same.

**Problem:** Inactive customers are not involving in bank products and it might chances to get them leave from the bank.

**Solution:** Launch new products and services related to customer focused so that their activity with financial transactions increases and eventually it increase credit score.

Along with that competitive bank customers take interest in our bank products & services.

### Exit Customers by Location

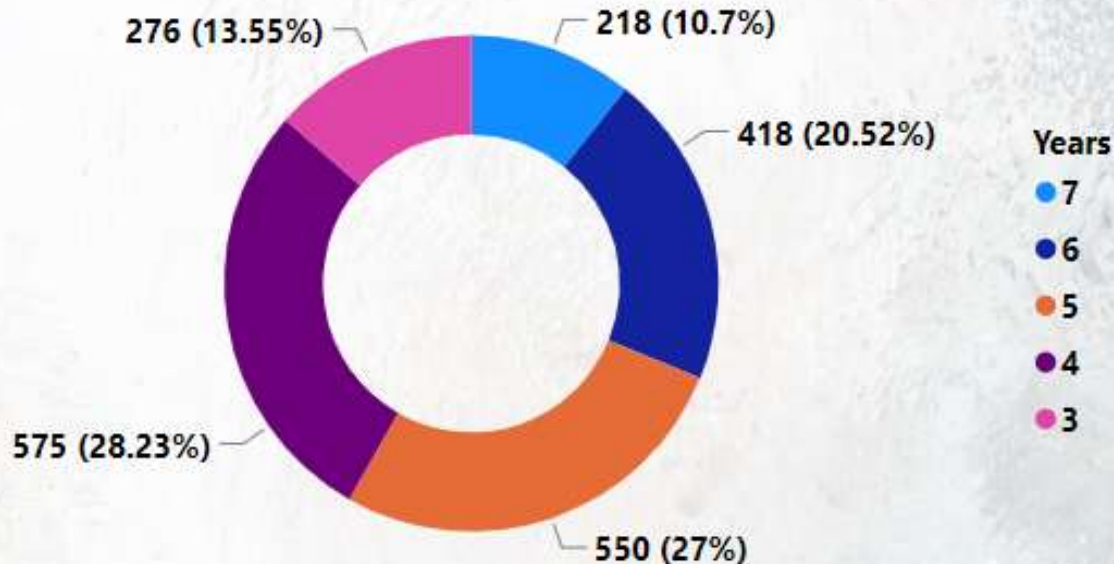


**Analysis 4 :** Exit customers count by France and Spain region from 2016 to 2019

**Problem:** France customers were not getting those services which the Spain customers were getting. Since France and Spain are sharing their boundaries, so there will not be product gap between 2 countries.

**Solution :** Product review and analysis of customer interest.

### Exit Customers by Years



**Analysis 5:** Count of customers exited after indulge in banking products and services.

**Problem :** More than 50% of customers left the bank after 3 and 4 years.

**Solution :** Work required on Customer relation management strategy to retain for long term.



# Row-Level security:

Power BI Desktop & Power BI Service

## Manage roles

### Roles

France Region

Spain Region

Create

Delete

### Tables

ActiveCustomer

Bank\_churn

CreditCard

CustomerInfo

DateMaster

DAX Calculations

ExitCustomers

Gender

Geography

### Table filter DAX expression

[GeographyLocation] = "Spain"

Filter the data that this role can see by entering a DAX filter expression that returns a True/False value. For example: [Entity ID] = "Value"

Save

Cancel

## Row-Level Security

France Region (1)

Spain Region (1)

### Members (1)

People or groups who belong to this role

Enter email addresses

Add

kartik10august@gmail.com ghagre X

Save

Cancel

# Schedule Refresh :

Gateway	Department	Contact information	Status	Actions
MySQL-Gateway		ghagre@solutionslear...	Running on DESKTOP-RUATDTF	

Data sources included in this dataset:

MySQL{"server":"localhost:3306","database":"bankcustomer"}	Maps to: MySQL
File{"path":"d:\\kaggle-churn analysis\\archive\\geography.xlsx"}	Maps to: Excel
File{"path":"d:\\kaggle-churn analysis\\archive\\customerinfo.csv"}	Maps to: Excel_1
File{"path":"d:\\kaggle-churn analysis\\archive\\active customer.xlsx"}	Maps to: Excel_2
File{"path":"d:\\kaggle-churn analysis\\archive\\credit card.xlsx"}	Maps to: Excel_3
File{"path":"d:\\kaggle-churn analysis\\archive\\gender.xlsx"}	Maps to: Excel_4
File{"path":"d:\\kaggle-churn analysis\\archive\\exitcustomer.xlsx"}	Maps to: Excel_5

Apply Discard

## Scheduled refresh

Keep your data up to date

Configure a data refresh schedule to import data from the data source into the dataset. [Learn more](#)

☒ On

### Refresh frequency

Daily

### Time zone

(UTC-05:00) Eastern Time (US and Ca

### Time

10 00 AM

4 00 PM

[Add another time](#)

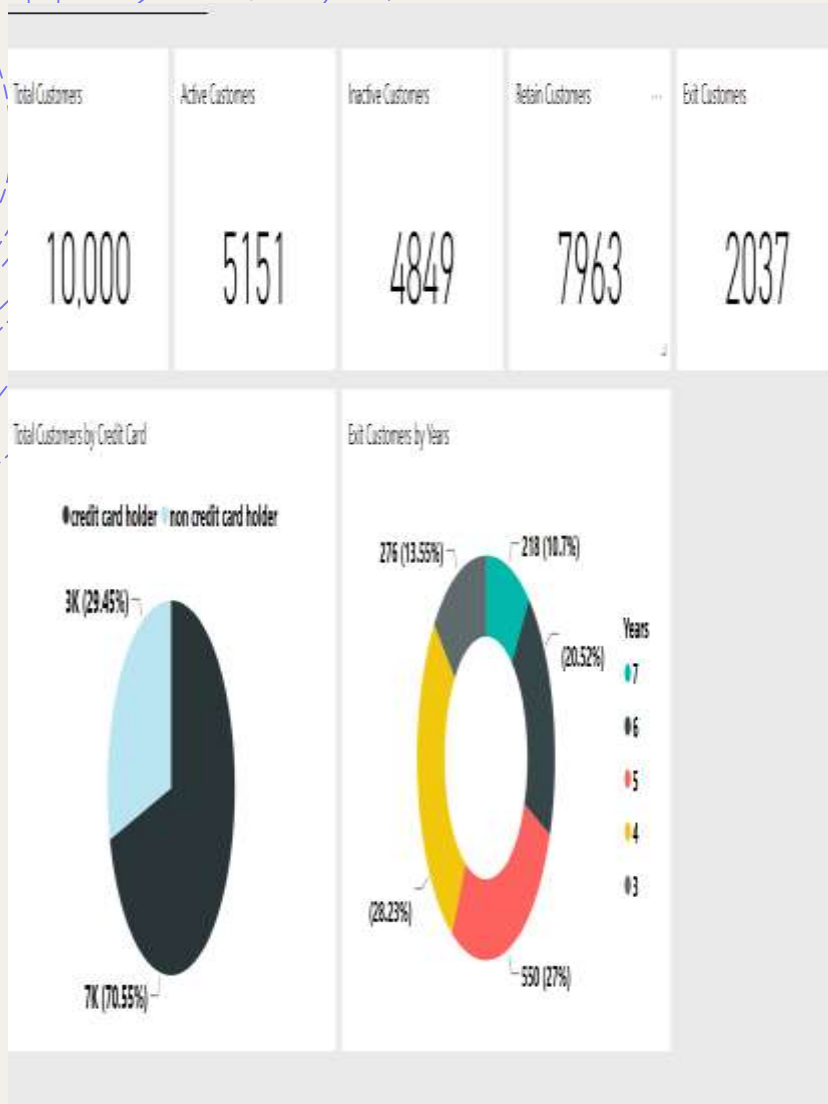
### Send refresh failure notifications to

☒ Dataset owner

☒ These contacts:

Kartik

# Dashboard, Subscription & Mobile Layout



### Subscribe to emails

BANK CHURN ANALYSIS DASHBOARD

+ Add new subscription

Bank Churn Analysis Dashboard Run now On

Subscribe

Enter email addresses

Subscribed users receive dashboard attachments with data based on your permissions

Subject

Include an optional message...

Frequency

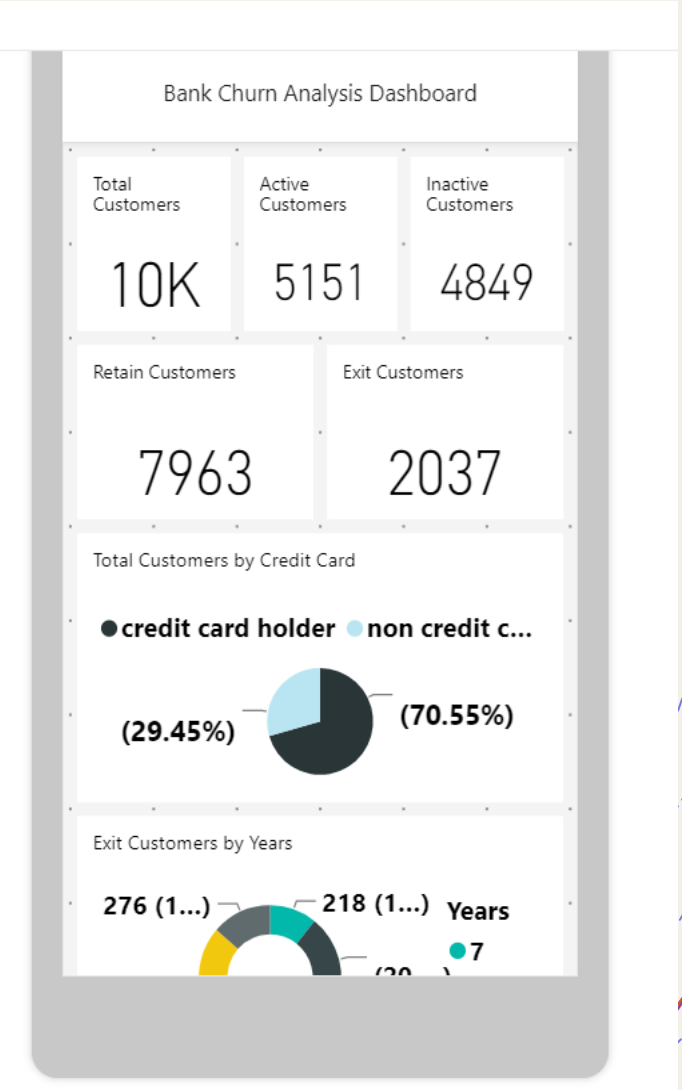
Weekly

☒ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat

Scheduled time

[Manage all subscriptions](#)

Save and close Cancel



# Thank you

+

References:

<https://www.kaggle.com/datasets/mathchi/churn-for-bank-customers>