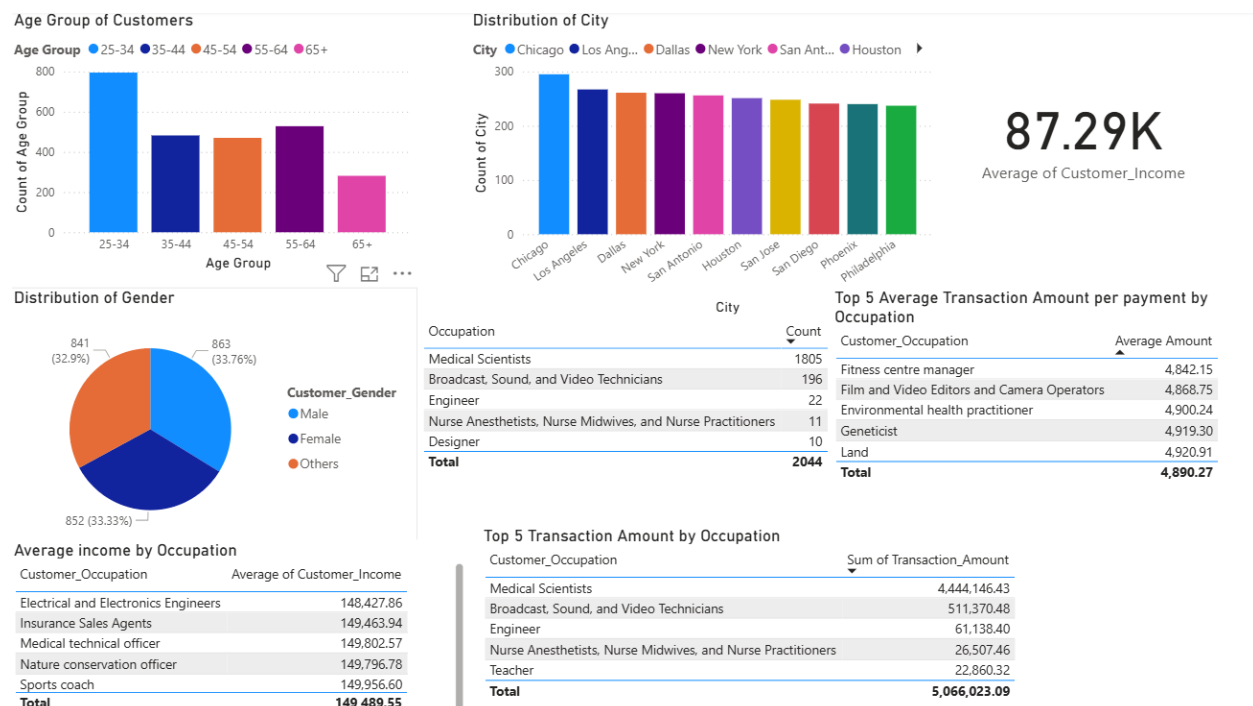# Key Takeaway:

- High transaction amount but more than two third of it was pending and fail transactions -> Find a way to change the proportion of transaction status
- Medical scientist contributed most to transaction value but appeared to have high possibility of conducting fraud
- No pattern of transaction payment in months. Moreover, during holidays, transactions were low in value
- Fraud transactions concentrated more at digital payment methods

Customer Profile:

Age Group of Customers

Age Group ● 25-34 ● 35-44 ● 45-54 ● 55-64 ● 65+

Distribution of City

City ● Chicago ● Los Ang... ● Dallas ● New York ● San Ant... ● Houston ▶

87.29K

Average of Customer_Income

Distribution of Gender

841 (32.9%)   863 (33.76%)

Customer_Gender
● Male
● Female
● Others

852 (33.33%)

Occupation	Count
Medical Scientists	1805
Broadcast, Sound, and Video Technicians	196
Engineer	22
Nurse Anesthetists, Nurse Midwives, and Nurse Practitioners	11
Designer	10
Total	**2044**

City

Top 5 Average Transaction Amount per payment by Occupation

Customer_Occupation	Average Amount
Fitness centre manager	4,842.15
Film and Video Editors and Camera Operators	4,868.75
Environmental health practitioner	4,900.24
Geneticist	4,919.30
Land	4,920.91
Total	**4,890.27**

Average income by Occupation

Customer_Occupation	Average of Customer_Income
Electrical and Electronics Engineers	148,427.86
Insurance Sales Agents	149,463.94
Medical technical officer	149,802.57
Nature conservation officer	149,796.78
Sports coach	149,956.60
Total	**149,489.55**

Top 5 Transaction Amount by Occupation

Customer_Occupation	Sum of Transaction_Amount
Medical Scientists	4,444,146.43
Broadcast, Sound, and Video Technicians	511,370.48
Engineer	61,138.40
Nurse Anesthetists, Nurse Midwives, and Nurse Practitioners	26,507.46
Teacher	22,860.32
Total	**5,066,023.09**

Main customer for the bank is from 25-34 (made up to 16% of all customers) while older people less likely to make payment at the bank, except for the group of 55-64

All of the transactions happened at big and influential cities of USA

The distribution of Gender is nearly the same with male slightly less than female

Employees from medical sector made up to 90% of the whole customers with most transaction amount but they were not in the list of making high transaction amount per

payment -> **Need to review why employees in these sectors make transactions with the bank most and how to leverage the amount per payment of this sector.**

Moreover, customers from top 5 well-paid jobs did not make much transaction with the bank compared to others -> **Consider if the bank should encourage these high-paid customers to make more transactions or focus more on the current.**

Transactions Insights (2023-2024):
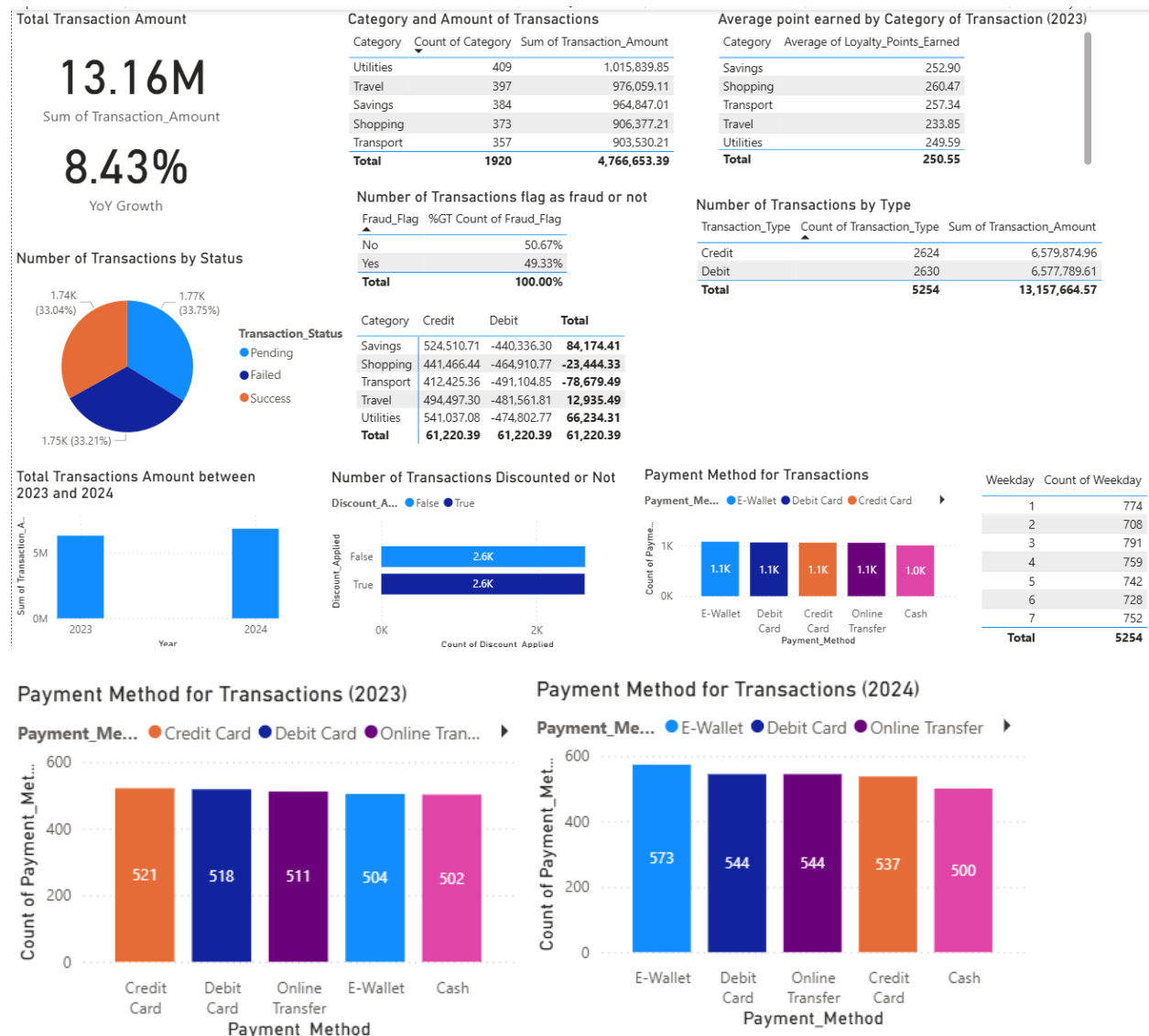
Payment method had shifted from credit card to E-wallet more (2023 vs 2024)

In 2 years, the bank recorded transactions amount up to 13 million US dollars with approximately 8.5% growth. However, when looking at transaction status, 33% of it failed. In the worst-case scenario, if the pending transaction turned into fail, bank only retained 4

million of transaction amount for them -> **Investigate reasons and find a way to shift the proposition of status (reducing fail, pending statuses and increasing successful one)**

One warning sign for the bank was suspicious transactions of the bank made up to 50% whether this signaled high fraud rate or the system of bank was too strict.

The bank had slightly more debit transactions (money outflow from account) but there were some noticing patterns:

- Travel category had positive net inflow whether these transactions got refunded or cashbach
- Same for utilities when this category was mostly for paying bills (worth considering why)
- Savings, Shopping and Transport demonstrated expected behavior. With savings, they have positive net inflow indicated a healthy saving habit while the other 2 had net outflow.

Top 5 categories of transactions in terms of amount and number (utilities, travel, savings, shoppings, transport) were mostly to pay for essential, entertainment and savings. These categories received most points for each transaction as well -> **Consider developing a loyalty program to stimulate customers to make payments in these categories more for points in redemption for gifts such as diversifying merchants to have more attractive offers for customers and increasing transactions for that merchant as well.**

It can be observed that customers behavior did not have any difference whether the transaction had discount or not or they preferred any kind of payments or anytime of the day.

Diving into 2023, it shared the same pattern with overall performance, however, the growth rate and amount of payment tended to be fluctuating - increasing gradually in a period then dropped (2 periods – February to May then June to September but stayed average at 520k per month, peaked amount on September). For 2024, the pattern was unclear as well and peaked at May -> **Find what was the main cause for the rise and down of transaction amount (whether due to the bank or external factors)**

Another noticing point was that, there was no significance in spending at the end of the year -> **Bank did not utilize how to increase the transaction amount during the end of year period**

Fraud Insights (2023-2024):

Transaction_Type	Potential Fraud Rate
Credit	7.94%
Debit	8.02%
Total	**15.96%**

Customer_Occupation	Potential Fraud Rate
Medical Scientists	11.13%
Broadcast, Sound, and Video Technicians	1.32%
Engineer	0.17%
Securities, Commodities, and Financial Services Sales Agents	0.07%
Top Executives	0.07%
Total	**12.77%**

Category	Potential Fraud Rate
Shopping	1.45%
Entertainment	1.34%
Utilities	1.34%
Education	1.26%
Healthcare	1.22%
Total	**6.61%**

2.14M
Sum of Transaction_Amount

15.96%
Potential Fraud Rate

The extracted data was successfully transacted but flagged as fraudulent (consider this as a potential loss). In the worst-case scenario, the bank lost 50% of its transactions with nearly a fifth of the potential fraud rate.

Fraud transactions tended to concentrate at category with higher net outflow (debit transactions which could explain why debit transactions had higher fraud rate). Moreover, the top 5 occupied nearly a third of potential fraud rate.

For occupation, Medical scientists contributed to almost 90% of the potential fraud -> **Customers from this needed to be revised despite the fact that they contributed most to the bank.**

The younger audience tended to make fraud transaction compared to other groups -> Higher risk group

Credit card, Online transfer and E-wallet appeared to be preferred methods for fraud activities although there was no significance in potential fraud rate between payment methods -> **Fraudulent activities focused on digital payments and bank had to consider educating customers as well as enhancing fraud prevention system.**

Different age groups would use different methods to commit their crime (in a 2 year period):

- 25-34: Focused on online transfer then shifted to Cash in 2024

- 35-44: Focused more on credit card on 2023 then shifted to E-wallet
- 45-54: Focused more on Debit card
- 55-64: Focused more on online transfer
- 65+: Focused more on E-wallet