Anomaly Detection in Credit Card Transactions

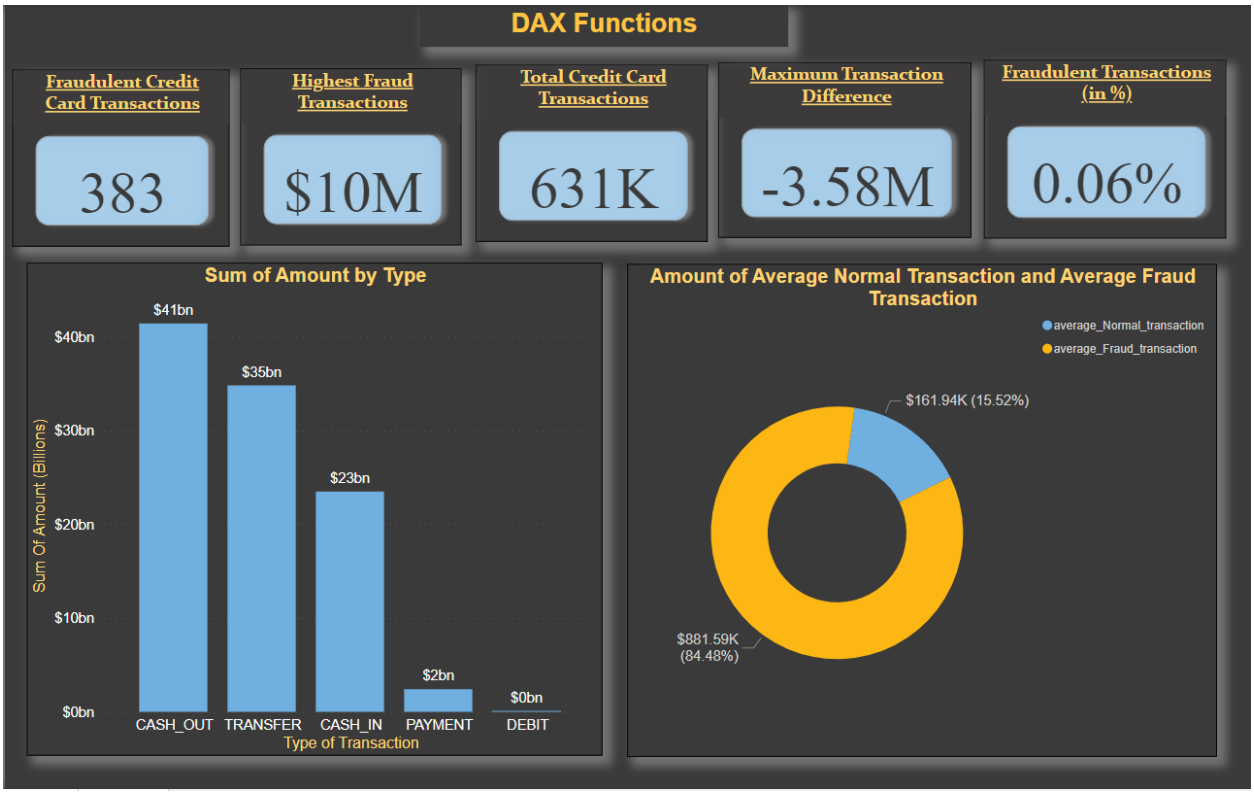

Figure 1. Anomaly Detection in Credit Card Transactions (DAX Functions)

Explanation

1.Which merchants have the highest number of transactions? (Only Top 10)

Ans: - We have used a table chart to show the top 10 highest number of transactions. Looking at the table chart, the highest no. of transactions is 95, which is recorded by a single merchant.

2. Create a scatter plot to visualize the relationship between 'oldbalanceOrg' and 'amount' columns.

Ans: - The scatter plot is used to find outliers. It helps us to visualize the relationship between the initial balance amount before the transaction (oldbalanceOrg) and amount by highlighting the outliers.

3. Use a line chart to plot the transaction amount over time (step) to identify any unusual spikes or drops in transaction amounts.

Ans: - This chart gives the trend of the total transaction amount with steps. In the dataset, one step is equal to the hour. The chart highlights the highest total transaction amount, reaching 7.3 billion, observed at the 18th step.

4. Are there any merchants with a high occurrence of fraudulent transactions?

Ans: - We utilized a table chart to identify merchants with a high occurrence of fraudulent transactions. The data from the tables reveals that, out of 380 merchants, three were involved in two instances of fraud each.

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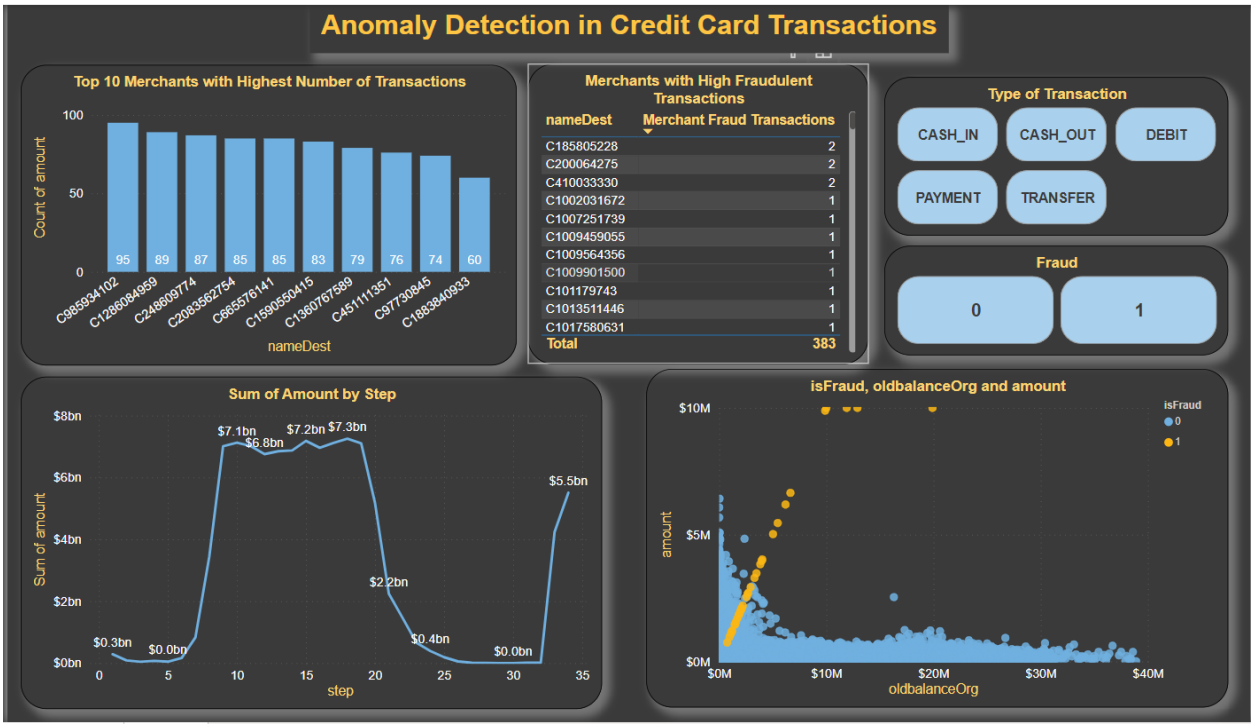

Figure 2. Anomaly Detection in Credit Card Transactions (Visualization)

Insights

1. Normal Transactions Overview:

- There were a considerable 6.42 million normal transactions, reflecting the routine activities in the dataset.

- Within this, a significant portion, totaling 631k transactions, involved the use of credit cards.

2. Fraud Transaction Types:

- Fraudulent activities were exclusively observed in cash-out and transfer type payments, highlighting these categories as more vulnerable to fraudulent behavior.

3. Frequency of Fraud in Cash-out Payments:

- Notably, the highest number of frauds occurred in cash-out type payments, highlighting the importance of implementing robust security measures for both cash-out and transfer transactions.

4. Overall Fraud Percentage:

- The dataset recorded a total of 631k transactions, with 383 identified as fraudulent, resulting in an overall fraud percentage of 0.06%.

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5. Fraud Rate in Cash-out Transactions:

- Specifically focusing on cash-out transactions, out of the 224k recorded, 197 were fraudulent, constituting a 0.09% fraud rate within this payment type.

6. Fraud Rate in Transfer Transactions:

- For transfer type payments, among the 52k transactions, 186 were identified as fraudulent, resulting in a higher 0.36% fraud rate compared to cash-out transactions.

7. Maximum Fraudulent Transaction Amount:

- The dataset captured a maximum fraudulent transaction amount of 10 million, indicating a significant threat level in certain instances.

8. Targeted Customers with Maximum Fraud:

- Interestingly, three distinct customers were targeted twice, each time with the maximum fraudulent amount.

9. Payment Type Popularity:

- The most frequently used payment type across all transactions was identified as cash-out transactions, indicating its widespread usage.

10. Least Utilized Payment Type:

- In compare, debit transactions emerged as the least utilized payment type among the recorded transactions, reflecting a lower frequency of occurrence.

Conclusion: -

These provide a deeper understanding of the dynamics within the credit card transactions dataset, emphasizing the specific areas where vigilance and security measures are crucial.