# Real-Life Fraud Detection Analysis

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Fraud detection assists businesses in protecting their financial resources by spotting and stopping fraudulent activity that can cause large losses. Effective fraud detection techniques can help to preserve good customer relations by showcasing a dedication to security and shielding clients from any financial loss (Fraudcom International, 2024).

- **key questions:**
  - Does fraud occur more frequently during specific time periods (steps)?
  - Are there accounts frequently involved in fraud?
  - What's the impact of fraud in terms of money lost?

- **List the columns and the importance of each in the context of fraud detection.**

  - **step**: Time step (hour) of the transaction – Helps detect time-based fraud patterns.
  - **type**: Transaction type (e.g., PAYMENT, TRANSFER) – Certain types may be more vulnerable to fraud.
  - **amount**: Transaction amount – Large or unusual amounts can indicate fraud.
  - **nameOrig**: Originator account ID – Helps track users making suspicious transactions.
  - **oldbalanceOrg**: Sender's balance before the transaction – Anomalies in balance behavior may indicate fraud.
  - **newbalanceOrig**: Sender's balance after the transaction – Detects if the amount was deducted properly.
  - **nameDest**: Recipient account ID – Helps track recipients involved in fraud schemes.
  - **oldbalanceDest**: Receiver's balance before the transaction – Identifies suspicious balance changes.
  - **newbalanceDest**: Receiver's balance after the transaction – Verifies if funds are properly received.
  - **isFraud**: Flag indicating if the transaction is fraudulent – Target variable for fraud analysis.

- **isFlaggedFraud**: If the transaction was flagged as fraud by the system – Useful to evaluate the system's accuracy.

- **Short note to the company describing one scenario where a legitimate transaction might appear fraudulent. Suggest ways to improve fraud detection without flagging such cases incorrectly.**
    - A corporate customer transferring more than $200k for payroll could be an example of a false positive. Even if this transaction is legal, the size of the sum could lead to it being reported as fraudulent.

      It is suggested that you use behavior-based detection, such as comparing the current transaction with previous transaction patterns, to increase accuracy. As an alternative to merely depending on predetermined thresholds, the introduction of machine learning anomaly scores may aid in the more efficient identification of anomalous activity.

- **Summarizing key findings.**

    - The data analysis makes it evident that the TRANSFER and CASH_OUT transaction types are where fraudulent activity mostly takes place. These dubious transactions sometimes entail substantial sums, typically approaching or above 200,000. Another trend seen is that fraud appears to occur frequently from the same accounts or at specific stages. Additionally, it is common for the balances at the destination to not change as anticipated, which may indicate manipulation or inconsistencies.

- **Steps could be implemented to reduce fraud risks.**

    - Organizations must utilize robust cybersecurity solutions and maintain them up to date to reduce fraud. Phishing and fraud detection training for employees is also necessary. Internal fraud is prevented by internal controls such as job separation and limited access. Ongoing auditing and continuous monitoring in real time optimize detection. Analytics on data may assist in detecting suspicious trends in advance. Trust is increased through the creation of an integrity culture with guidelines and anonymous reporting. Finally, cooperation with law enforcement and other firms increases protection and knowledge sharing (Amos, n.d.).

# References

Fraudcom International. (2024, March 4). *What is fraud detection and why is it needed?* Fraud.com. https://www.fraud.com/post/fraud-detection#:~:text=Protecting%20financial%20assets%3A%20Fraud%20detection,result%20in%20significant%20monetary%20losses.

Amos, Z. (n.d.). *7 Tips for fraud Prevention for multinational companies*. https://gca.isa.org/blog/7-tips-for-fraud-prevention-for-multinational-companies