**EMPLOYEE FRAUD AND POLICY VIOLATION**

**Digital Forensics Analysis Report**

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Table of Contents

[Introduction 3](#_Toc159969486)

[Summary of Analysis 3](#_Toc159969487)

[Objectives 3](#_Toc159969488)

[Forensic Examination 3](#_Toc159969489)

[Chain of Custody 3](#_Toc159969490)

[Methods and Tools Used 3](#_Toc159969491)

[Analysis 4](#_Toc159969492)

[Relevant Findings 4](#_Toc159969493)

[Violation of Company Policy 4](#_Toc159969494)

[Fraud 5](#_Toc159969495)

[Conclusion 5](#_Toc159969496)

[Appendix 5](#_Toc159969497)

[Appendix A: Company Policy Regarding Customer Returns 5](#_Toc159969498)

[Appendix B: Data Dictionary 6](#_Toc159969499)

[Appendix C: SQL Codes and results 7](#_Toc159969500)

# Introduction

The purpose of this report is to provide a thorough analysis of customer return data using SQL to detect fraud or violation of the company policies and procedures.

## Summary of Analysis

An SQLite database containing two tables, namely employee and returns, was provided. This data was received on February 25, 2024 and was validated to be authentic with the original document.

Data was analyzed for policy violation and fraud using SQL. Anomalies were discovered with some of the returned items without a receipt. A total of 85 of these transactions were found that return funds were sent to a credit or debit card instead as a gift card. The total cost for these transactions is 5,010.53 dollars

Among these, 68 transactions are subject to fraudulent claims as funds for each distinct customer are sent to either one of two credit cards. Furthermore, all these incidents are named under a single employee. These transactions amount to 4,172.98 dollars.

## Objectives

The objectives of this analysis are to:

1. Find any potential fraud in customer returns.
2. Discover violations to the company policy regarding customer return.

# Forensic Examination

## Chain of Custody

The hash number of the received document is consistent with the original indicating that the analyzed database has not been tampered with.

Table 1. Chain of Custody

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| File # | File Name | Date of the File | Date Received | Original file hash | Received file hash |
| 1 | customer\_returns\_simulated\_data.db | 2/17/2024 | 2/25/2024 | 36821523F51EE71F48D50813CB9F5B979C9111745133C95F2348830C9BD56B71 | 36821523F51EE71F48D50813CB9F5B979C9111745133C95F2348830C9BD56B71 |

## Methods and Tools Used

SHA-256 checksum was performed in Windows PowerShell for each of the files to confirm that their hash numbers were authentic and identical to the original.

Data analysis was done using SQL and DB SQLite Browser.

## Analysis

An SQLite Database containing two tables was provided for analysis. The “employee” table includes 25 records of the employees of the company. The “returns” table contains the data regarding customer returns with a total of 1,306 records. Detailed information regarding the two tables can be found in Appendix B: Data Dictionary.

Using the company’s policy (Appendix A: Company Policy Regarding Customer Returns) as a guide, the following circumstances were checked to detect fraud and violation. The SQL codes for each of these scenarios can be found in Appendix C: SQL Codes and results.

Table 1. Summary of Analyses and Findings

|  |  |  |
| --- | --- | --- |
| # | Analysis Done | Findings |
| 1 | Item returned without a receipt, but funds were returned to a credit card | Fraud/violation of policy |
| 2 | Duplicate credit card information for different customers | Fraud |
| 3 | Missing customer information | No relevant findings |
| 4 | Employee ID in the returns table cross-checked with the information in the employee table | No relevant findings |
| 5 | Duplicate receipt IDs | No relevant findings |
| 6 | Incorrect gift card serial number | No relevant findings |

## Relevant Findings

### Violation of Company Policy

Company policy states that items returned without a receipt must be issued with a gift card for store credit and should not be refunded through their credit or debit card.

A total of 85 cases violated this policy with return funds amounting to 5,010.53 dollars.

A screenshot of a computer code

Description automatically generated

Three employees were found responsible for these cases: John Mason with a total of 13 cases, Mark Moore with 68 cases, and Anthony West Jr with 4 cases. These incidents are worth $ 601.47, $ 4,172.98, and $ 236.08 respectively.

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### Fraud

Data shows that there are two credit cards that were used for multiple return transactions. Credit card number 2703144240071235 was used 46 times while credit card number 40077653923591 was used 22 times under different customer names. It is unlikely that 46 and 22 unique individuals used the same payment method.

Furthermore, all 68 transactions were processed by a single employee, Mark Moore. With that being said, it is possible that these are fake returns with funds sent to Mark’s accounts. The total amount of these transactions for the two cards is 4,172.98 dollars.

A screenshot of a computer

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# Conclusion

Out of 1,306 transactions, 85 of which violated the company return policy through fund receipt via credit/debit card instead of gift cards or in-store credit.

Out of these 85 violations, 68 of which are considered fraud. Returns from multiple customers with unique information had funds sent to only two credit/debit cards suggesting that these transactions are fake.

# Appendix

## Appendix A: Company Policy Regarding Customer Returns

1. Customers may return products for a return of the funds onto their debit/credit card or receive a gift card as follows.
2. For all returns, Employees shall manually record the customers ‘name, street address, city, state, and phone number into the return POS software.
3. If a receipt is present, the employee scans the receipt which causes the computer to record the return date and return price amount automatically.
4. If a receipt is present, the customer may choose to receive the funds as a gift card or to be returned to a credit/debit card.
   1. If the customer chooses a gift card, the employee scans the gift card. The POS software records the gift card number and puts the return price onto the gift card automatically.
   2. If the customer chooses to have the funds returned to their debit/credit card, the employee swipes the debit/credit card. The computer records the debit/credit card number and expiration date and transfers the return price to the debit/credit card automatically.
5. If the receipt is not present, the employee shall do the following:
   1. Returns without receipts must be issued a gift card for store credit and shall not receive funds on a debit/credit card.
   2. Employee scans the UPC barcode on the returned item. The POS software records the return price and records today’s date as the return date.
   3. The employee scans the gift card. The POS software records the gift card number and puts the return price onto the card automatically.

## Appendix B: Data Dictionary

Table 2: Employee Data Dictionary

|  |  |  |
| --- | --- | --- |
| **Column** | **Data Type** | **Description** |
| EmployeeID | integer | ID of the employee |
| Name | text | full name of the employee |
| HireDate | text (not datetime) | date hired. Queries on dates must be in text format with quotes, e.g. “2023-01-15” |
| Street | text | street address of residence |
| City | text | city of residence |
| State | text | state of residence |

Table 3: Returns Data Dictionary

|  |  |  |
| --- | --- | --- |
| **Column** | **Data Type** | **Description** |
| ReturnID | Real | Unique identifier of the return. |
| IsReceiptPresent | Text | Was a receipt present at the time of the return? ‘True’ or ‘False’. SQLite does not have a native boolean. These are text values and require quotes. |
| ReceiptId | Text | Serial number of the original receipt. |
| ReturnDate | Text | Date the return is processed. |
| ReturnPrice | Text | Amount of the return. |
| CustomerName | Text | Name of the customer. |
| Street | Text | Street  where the customer resides. |
| City | Text | City residence. |
| State | Text | State residence. |
| CustomerPhone | Text | Customer phone number. |
| CreditCardNum | Text | Debit or credit card number for which the return amount is refunded. |
| CreditCardExpire | Text | Expiration date of the debit or credit card for which the return amount is refunded. |
| GiftCardNumber | Text | Serial number of the gift card, all gift cards start with the number “9” |
| EmployeeId | Integer | Id of the employee who processed the return |

## Appendix C: SQL Codes and results

1. Item returned without a receipt, but funds were returned to a credit card

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1. Duplicate credit card information for different customers

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A white board with text on it

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1. No or missing customer information

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1. Employee ID in returns table cross check with employee table

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1. Duplicate Receipt IDs

A screenshot of a computer program

Description automatically generated

1. Incorrect gift card serial numbers

A screenshot of a computer

Description automatically generated