
Enhancing Motor Insurance in the United States: A Data-Driven Approach



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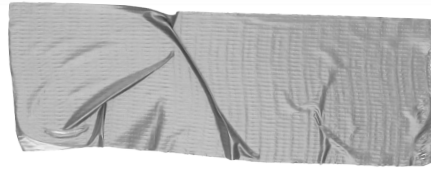
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PROJECT IDENTIFICATION

- Project Introduction
- Defining a Problem Statement:



PROJECT INTRODUCTION

Motor insurance, a cornerstone of the American insurance industry, plays a crucial role in providing financial protection to vehicle owners against various risks, including accidents, theft, and liability. However, despite its importance, a significant portion of the population remains uninsured, citing reasons such as cost and lack of awareness about available options. To address these challenges and make motor insurance more accessible and affordable, innovative strategies grounded in data-driven insights are essential. The objective of this project is to analyze the current state of motor insurance in the United States, taking into account the challenges faced by uninsured individuals, and develop a comprehensive strategy to revolutionize the industry. By leveraging advanced data analytics and machine learning techniques, we aim to:

Implement fraud detection algorithms to identify and prevent fraudulent claims, ensuring that insurance remains affordable for all. By the end of this project, we expect to deliver a comprehensive analysis of the motor insurance landscape in the United States, along with a detailed strategy to the industry. This strategy will be grounded in data-driven insights and aimed at combating fraud and driving innovation in the motor insurance sector.

PROBLEM STATEMENT

The motor insurance industry in the United States faces a significant challenge with fraudulent claims, which not only lead to financial losses but also contribute to the overall cost of insurance for policyholders. With approximately 28 million people uninsured and 52% perceiving insurance as too expensive, combating fraud is crucial to maintaining affordability and accessibility in the insurance market.

To address this issue, this project aims to develop and implement advanced fraud detection algorithms in the motor insurance sector. By leveraging machine learning and data analytics, these algorithms will be designed to identify patterns and anomalies indicative of fraudulent behavior, enabling insurance companies to detect and prevent fraudulent claims more effectively.

The successful implementation of these fraud detection algorithms will not only protect insurance companies from financial losses but also contribute to the overall affordability of insurance for all individuals, including the uninsured and those who perceive insurance as unaffordable.



PLANNING

- Creating a project landscape
- Project Planning



Project Landscape

The following is aimed to guide you through the project landscape journey.

Data

- Data can be found on the ExploreAI github repository.
- Publically available.
- Data format is structured and uncleaned.

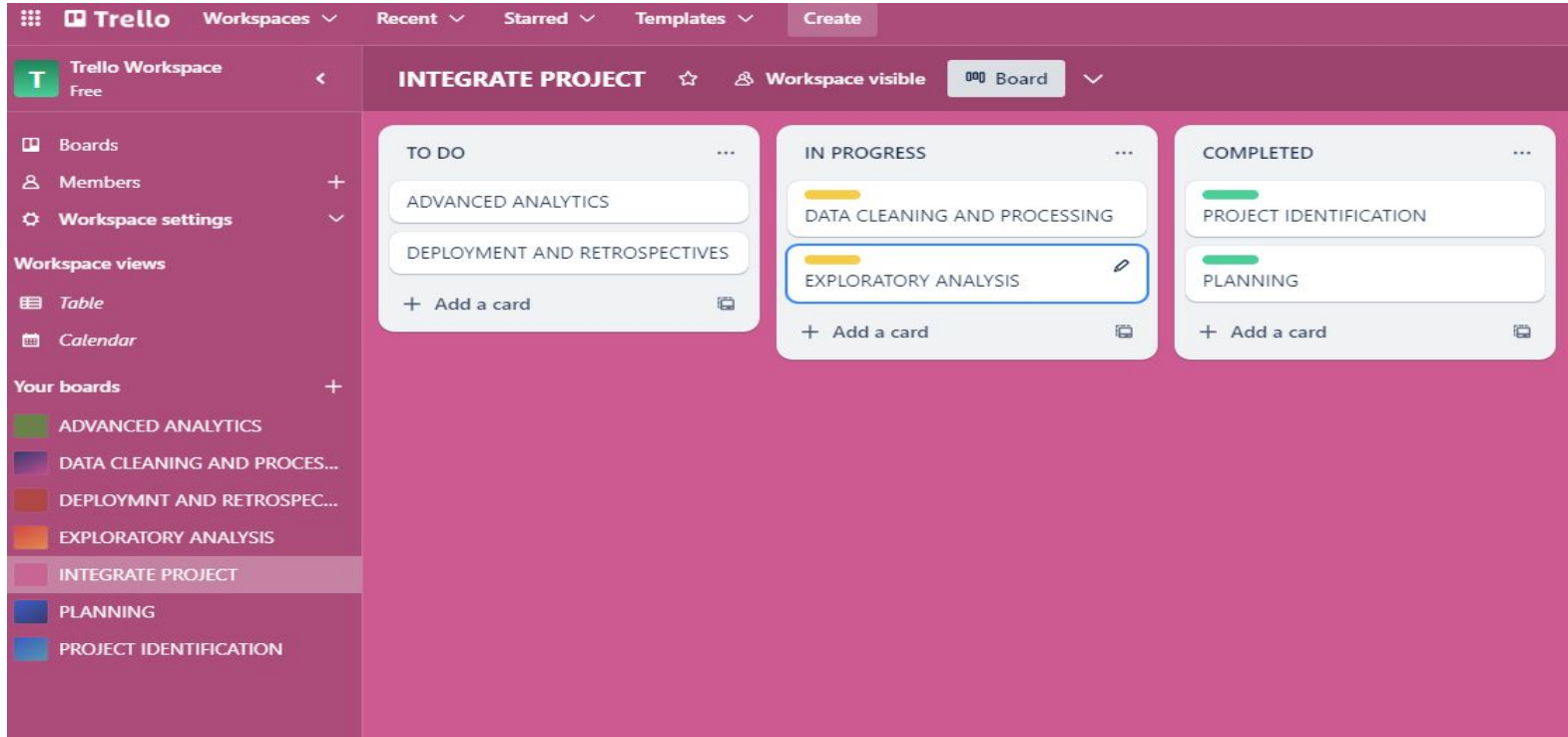
Information

- The data dictionary tells us the data is a collection of rows and columns in an excel file.
- The data is gathered and updated manually(potential process automation)
- Problem could be solved Data Science (data analytics and machine learning techniques)

Knowledge

- Machine Learning Models
- Data Analytics
- Feature Engineering
- Building dashboards
- User Test and Evaluation

Project Planning



The screenshot displays a Trello workspace interface for a project named "INTEGRATE PROJECT". The workspace is set to "Free" and is visible to the entire workspace. The board is a Kanban-style board with three columns: "TO DO", "IN PROGRESS", and "COMPLETED".

- TO DO Column:** Contains two cards: "ADVANCED ANALYTICS" and "DEPLOYMENT AND RETROSPECTIVES".
- IN PROGRESS Column:** Contains two cards: "DATA CLEANING AND PROCESSING" and "EXPLORATORY ANALYSIS". The "EXPLORATORY ANALYSIS" card is highlighted with a blue border and a pencil icon, indicating it is the current card being viewed or edited.
- COMPLETED Column:** Contains two cards: "PROJECT IDENTIFICATION" and "PLANNING".

The left sidebar shows the workspace navigation menu, including "Boards", "Members", "Workspace settings", "Workspace views" (Table, Calendar), and "Your boards". The "Your boards" section lists several boards, with "INTEGRATE PROJECT" currently selected.

CREATING A STORY

Uncovering Insurance Fraud: A Detective's Journey

Detective Jane had always been intrigued by the patterns behind fraudulent claims. One day, as she sipped her tea and scanned through the latest insurance data, she noticed a few curious trends. Armed with her analytical prowess, she set out to unravel the mystery of insurance fraud.

Policy Annual Premium:

Jane noticed that policyholders with unusually high or low annual premiums often raised red flags. For instance, one policyholder, Mr. Smith, led a modest lifestyle but suddenly had an exceptionally high annual premium. Jane couldn't help but wonder if this disparity was a deliberate attempt to disguise fraudulent behavior.

Property Claim:

As Jane delved deeper, she discovered another pattern. Policyholders like Mrs. Johnson, who claimed disproportionately high amounts for property damage, often stood out. Her claims were significantly higher than the average for similar properties, which made Kholiswa suspect that Mrs. Johnson might be inflating her claims.

CREATING A STORY

Insured Hobbies (Chess):

The insured hobbies section provided Jane with a fascinating insight. Mr. Adams had always reported his hobby as chess. However, when he filed a claim for an expensive golf equipment loss, Jane raised an eyebrow. It seemed suspicious that Mr. Adams suddenly had an expensive hobby he had never mentioned before.

Insured Zip Code:

Geographic location played a crucial role in Jane's investigation. She knew that certain areas had higher incidences of fraud. For instance, claims coming from a particular zip code known for its high fraud rates were always scrutinized more closely. Mrs. Lee's high-value claims from this area immediately caught Jane's attention.

Total Claim Amount:

The total claim amount was a critical factor in Jane's investigation. She observed that fraudulent claims often involved exaggerated or completely false amounts. Mr. Brown's total claim amount was unusually high compared to the average, which made Jane suspicious. Could Mr. Brown be inflating his claims to receive a larger payout?

CREATING A STORY

Policy Number:

Although a policy number might seem innocuous, Jane knew better. New policies with large claims shortly after initiation were always suspicious. Mr. Green's new policy, combined with a significant claim just a month after it started, made Jane wonder if he was attempting to game the system.

Incident Severity (Minor Damage and Total Loss):

Jane found that the severity of incidents provided valuable insights. Minor damages that seemed exaggerated or total loss claims that didn't align with incident reports were often fraudulent. Mrs. White's pattern of claims, all marked as minor damage but inconsistent with the incident details, made Jane suspect foul play. Similarly, Mr. Black's total loss claim, which didn't match the circumstances, raised further doubts.

Vehicle Claim:

Finally, Jane looked at vehicle claims. High vehicle claim amounts, especially when combined with high property and total claims, were often red flags. Mr. Taylor's high vehicle claim amount, along with his equally high property claim, made Jane question the legitimacy of his claims.



Reasons insurance fraud exists

Insurance fraud can occur for various reasons, and understanding these motives can help in developing effective prevention strategies. Here are some common reasons why people commit insurance fraud:

1. Financial Gain:

- **Direct Financial Benefit:** The primary motive for most insurance frauds is monetary gain. Individuals may fabricate or exaggerate claims to receive payouts they are not entitled to.
- **Economic Pressure:** Financial stress, debt, or economic hardship can drive individuals to commit fraud to alleviate their financial burdens.



2. Perceived Low Risk of Detection:

- **Opportunity and Ease:** When individuals perceive that the likelihood of getting caught is low or that the investigation process is weak, they may be more inclined to commit fraud.
- **Complexity of Detection:** The complexity and length of insurance processes can create opportunities for fraudsters to exploit loopholes.

3. Rationalization and Justification:

- **Justifying the Act:** Some individuals rationalize their fraudulent behavior by convincing themselves that it is a victimless crime or that the insurance companies can afford the losses.
- **Moral Justification:** People might feel justified in committing fraud if they believe they have been unfairly treated by the insurance company in the past.



4. Systematic Exploitation:

- **Organized Crime:** In some cases, fraud is perpetrated by organized crime rings that systematically exploit the insurance system through staged accidents, false claims, and other schemes.
- **Collusion:** There may be collusion between claimants and other parties, such as repair shops, healthcare providers, or even insiders within the insurance company.

5. Lack of Awareness and Education:

- **Ignorance of Consequences:** Some individuals may not fully understand the legal and financial consequences of committing fraud.
- **Underestimation of Impact:** They might underestimate the broader impact of their actions on insurance premiums and the industry.



6. Fraudulent Intent at Policy Inception:

- **Pre-existing Conditions:** Individuals may hide pre-existing conditions or previous incidents to obtain a policy or to qualify for lower premiums.
- **Intentional Damage:** Policyholders might intentionally cause damage or loss after obtaining coverage to make a claim.

7. Greed and Opportunism:

- **Maximizing Benefits:** Some people commit fraud simply out of greed, seeking to maximize their benefits or receive compensation they believe they deserve.
- **Opportunistic Fraud:** Situations may arise where individuals see an unexpected opportunity to commit fraud and take advantage of it.

Preventing insurance fraud involves implementing various strategies to detect and deter fraudulent activities. Here are some key solutions:



Communicating a solution

Data Analytics and AI:

Use data analytics and AI algorithms to analyze large volumes of data and detect patterns indicative of fraud. Machine learning models can be trained on historical fraud data to identify new fraudulent activities.

Fraud Detection

Software: Implement fraud detection software that uses advanced algorithms to flag suspicious claims or transactions. These systems can also incorporate predictive modeling to identify potential fraud before it occurs.

Claim Validation

Procedures: Implement robust claim validation procedures to ensure that claims are legitimate. This can include verifying the details of the claim, such as the extent of the loss or damage, and using third-party services to verify claims.

Communicating a solution

Collaboration and Information Sharing:

Collaborate with other insurers, law enforcement agencies, and industry bodies to share information and best practices for fraud prevention. This can help identify fraudsters who operate across multiple insurers.

Customer Education:

Educate customers about insurance fraud and its consequences. Encourage them to report any suspicious activities or offers to the insurance company.

Continuous Monitoring and Review: Continuously monitor fraud trends and update fraud detection measures accordingly. Regularly review and update fraud prevention policies and procedures.

By implementing these solutions, insurance companies can reduce the occurrence of fraud and protect themselves and their customers from financial losses.

