Auto Insurance Claim Fraud Analytics

AI-powered Solution to Combat Claims Frauds with Ease

Introduction

Globally, insurance fraud is a growing concern for Insurers as they witness a drastic increase in fraudulent claims year-on-year. Among the various types of insurance frauds, automobile fraud is found to be the most predominant which encompasses a range of illicit practices involving intentional deception or misinterpretations such as staging an accident, the policyholder not involved in the claimed accident or a fake injury.

Conventionally, insurance firms have been relying on the expert judgements of special investigation units to detect and prevent frauds. However, with increase in the number of claims and greater sophistication of fraudsters, it has become difficult to manually scrutinize all the claims for fraud. Hence there is a need for insurers to implement a powerful solution that can help predict and identify potential frauds with high degree of accuracy, ensuring that the identified cases are scrutinized in detail without impacting the non-fraud cases. This is where data analytics comes to rescue which helps in building algorithms to prevent, detect and filter potential fraud in a seamless manner.

NEC's Auto Insurance Claim Fraud Analytics solution enable insurance companies combat fraud with effective claim segmentation and accurately analysing the signs of fraud before the claim is paid, thus improving the rate of genuine claims, increasing customer satisfaction and significantly reduce costs associated with fraud claims investigation.
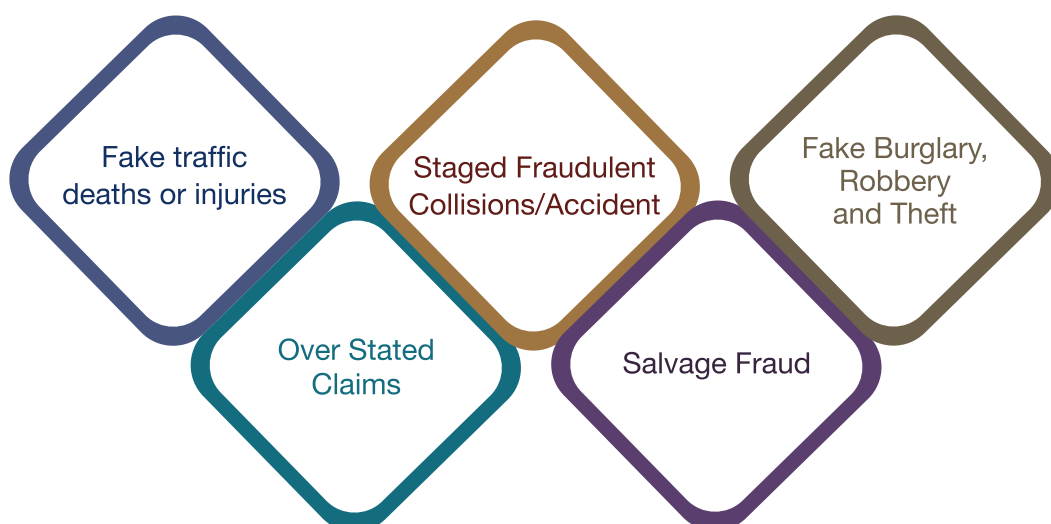
Opportunities in Insurance Sector

**$880 B
Market Size**

**15-17%
Auto Insurance
Claim Payment**

**$40 B
Fraud Estimate**

- India spent $6.25 B as Insurance Fraud in 2019*.
- 90% of this fraud was into motor insurance.

*Source- India Forensic Study

Types of Insurance Claim Frauds

Fake traffic deaths or injuries

Over Stated Claims

Staged Fraudulent Collisions/Accident

Salvage Fraud

Fake Burglary, Robbery and Theft

Auto Insurance Claim Fraud Analytics
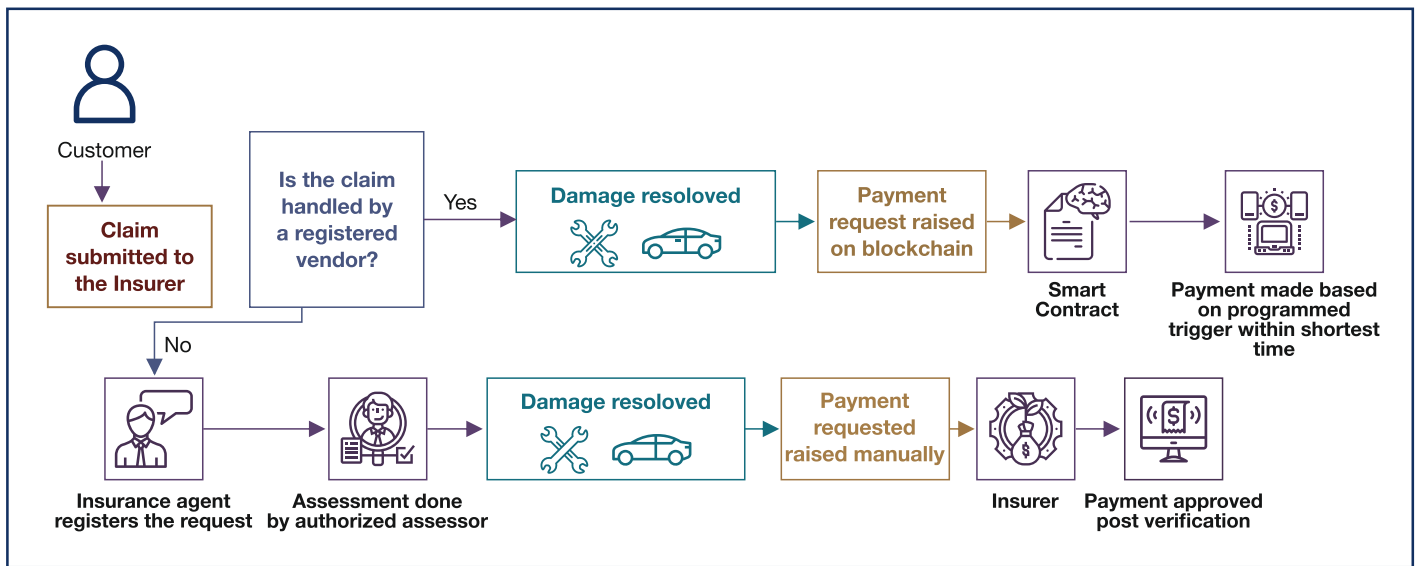
Business Challenge

Claim Prediction: If any claim is going to happen by an insurer or not along with the claim amount

Fraud Detection: To detect fraudulent claims

Cost Saving Prediction: To predict how much revenue the company will save as fraud claims are pre-determined
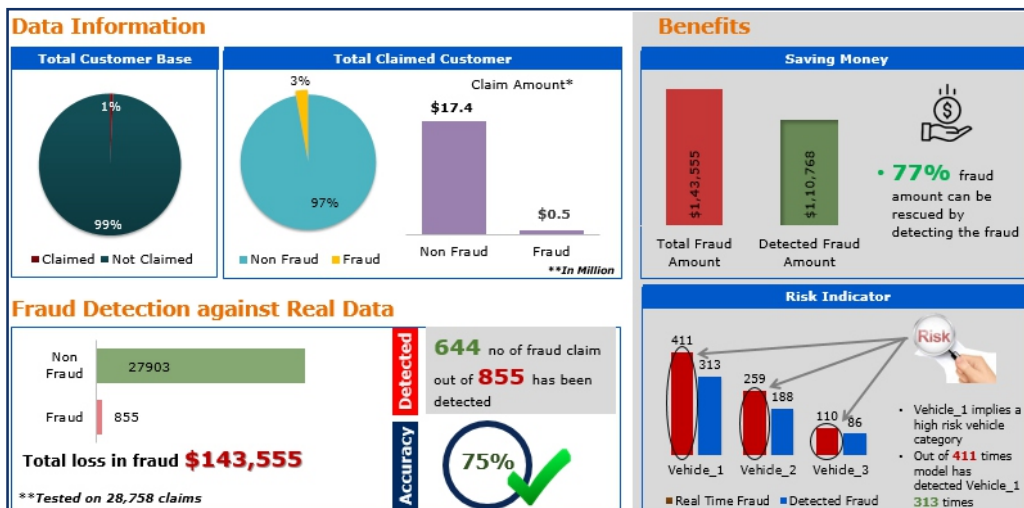
Solution

- Build classification model to predict if customer is going to claim or not
- Build regression model to forecast the claim amount
- Classification model to detect the fraudulent claims

Results

Prediction of customers going to claim

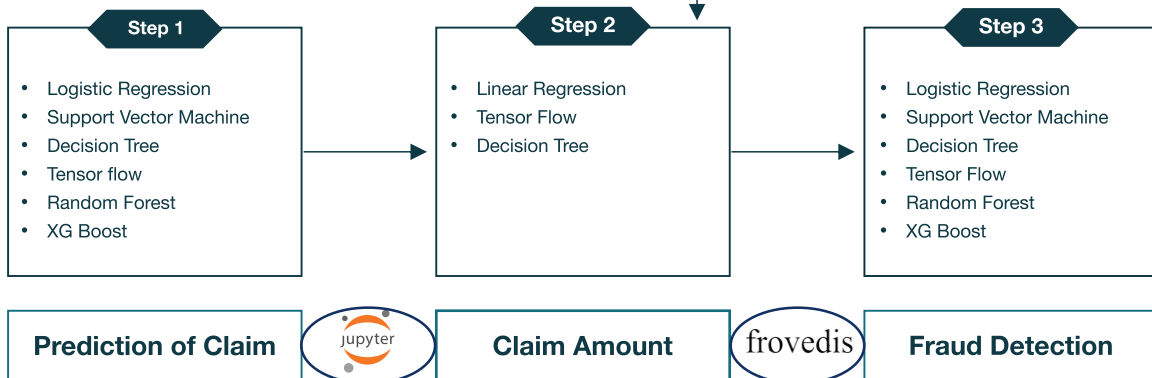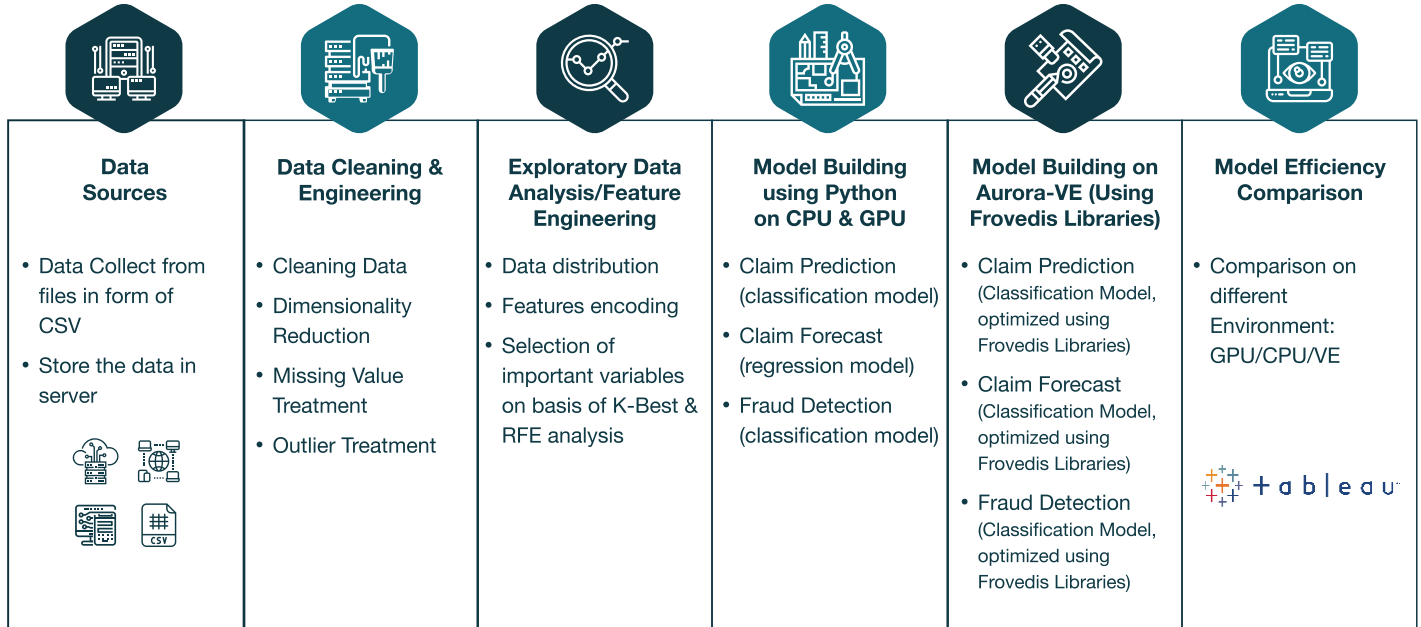Forecast the claim amount

Detection of fraudulent claim

Analytics View

Solution Flow

Superior architecture to fight all lines of automobile insurance fraud. Engage with the complete suite of supervised and unsupervised artificial intelligence and machine learning models to enable efficient investigation.

Data Sources	Data Cleaning & Engineering	Exploratory Data Analysis/Feature Engineering	Model Building using Python on CPU & GPU	Model Building on Aurora-VE (Using Frovedis Libraries)	Model Efficiency Comparison
• Data Collect from files in form of CSV • Store the data in server	• Cleaning Data • Dimensionality Reduction • Missing Value Treatment • Outlier Treatment	• Data distribution • Features encoding • Selection of important variables on basis of K-Best & RFE analysis	• Claim Prediction (classification model) • Claim Forecast (regression model) • Fraud Detection (classification model)	• Claim Prediction (Classification Model, optimized using Frovedis Libraries) • Claim Forecast (Classification Model, optimized using Frovedis Libraries) • Fraud Detection (Classification Model, optimized using Frovedis Libraries)	• Comparison on different Environment: GPU/CPU/VE

Step 1
- Logistic Regression
- Support Vector Machine
- Decision Tree
- Tensor flow
- Random Forest
- XG Boost

Step 2
- Linear Regression
- Tensor Flow
- Decision Tree

Step 3
- Logistic Regression
- Support Vector Machine
- Decision Tree
- Tensor Flow
- Random Forest
- XG Boost

Prediction of Claim	Claim Amount	Fraud Detection

How it Works?

Auto Insurance Analytics Solution for Claims and Fraud Detection is designed not only to support requirements of analytics users but also business users.

Data Collection

Capability to ingest data from multiple data sources hosting Claims, Incident, Customer data etc through click of a button

Data Preparation & Wrangling

Enables data modifications necessary to support Descriptive and Predictive Analysis

Explore, Insights, Pattern

Powerful module to explore and analyze claims data to identify patterns and derive insights at demographics, vehicle type etc level

Feature Engineering

Supports various feature engineering algorithms to enable dimension reduction so as to create robust Analytical Datasets

veCognify Capsule

Create advanced machine learning models using customized algorithms to enable Claim Prediction and Fraud detection

Dashboard

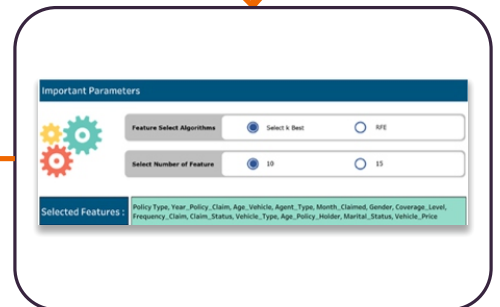Integrated Simulation Dashboard to evaluate business scenarios
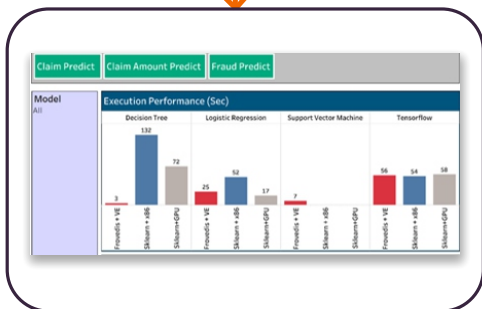
Dashboard Watch

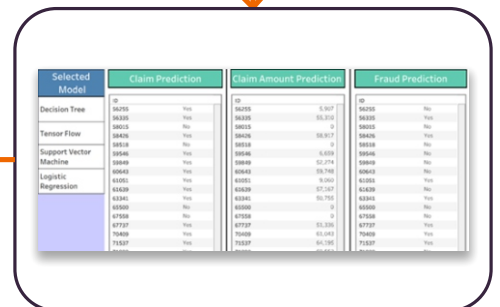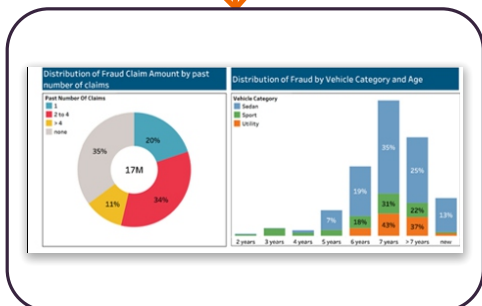Data Collection

Date Preparation

Data Exploration

Feature Engineering

Model Building

Data Prediction

Analysis

Why NEC

NEC possess deep expertise in the design and implementation of auto insurance fraud detection solutions that leverage the most innovative big data techniques including predictive modeling and machine learning (ML). We work by analysing your current fraud detection practices/technologies to identify the bottlenecks that need to be addressed to reduce both frauds and errors. Our mission is to minimize your fraud rate and increase your profits by lowering the costs of auto insurance fraud for your organization.
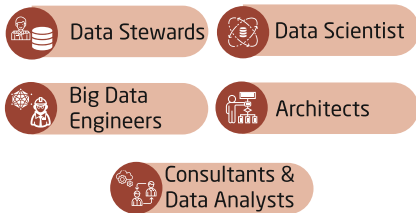
Capabilities on Technology Stack

Core business experience combined with domain and technical expertise with evolving tools and technologies.

Skilled Workforce

In-house business & domain experts

- Data Stewards
- Data Scientist
- Big Data Engineers
- Architects
- Consultants & Data Analysts

Domain Expertise

Solving Complex Data Challenges

Myriad of Successful Analytics Projects

Dedicated Analytics Research Labs

Work for Solutions for Societies

Robust Partner Ecosystem

Strong Partnerships & Alliances Across Data Platforms and Analytics Solutions

Technology Partners

hadoop · CLOUDERA · Spark · HIVE · kafka · STORM · nifi · HBASE

elasticsearch · talend · Informatica · Greenplum · denodo · logstash · tableau

Power BI · pentaho · Qlik · kibana · R Studio · python · R · SPSS · sas

theano · GUROBI OPTIMIZATION · Azure · aws · torch · Caffe · TensorFlow · PostgreSQL