Machine learning model detecting fraud in insurance claims

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01 Problem Statement & Solution

Fraud occurs but can’t detect some cases

e.g.

John is a customer who has recently filed a claim with his auto insurance company after his car was involved in an accident

1. The accident report contains inconsistent information :

- The time and location of the accident are different in the police report and the hospital records.
- Has pre-existing injury in the same location as the one he claims to have sustained in the accident

2. Has recently experienced financial difficulties and has a history of bankruptcy and other financial problems.

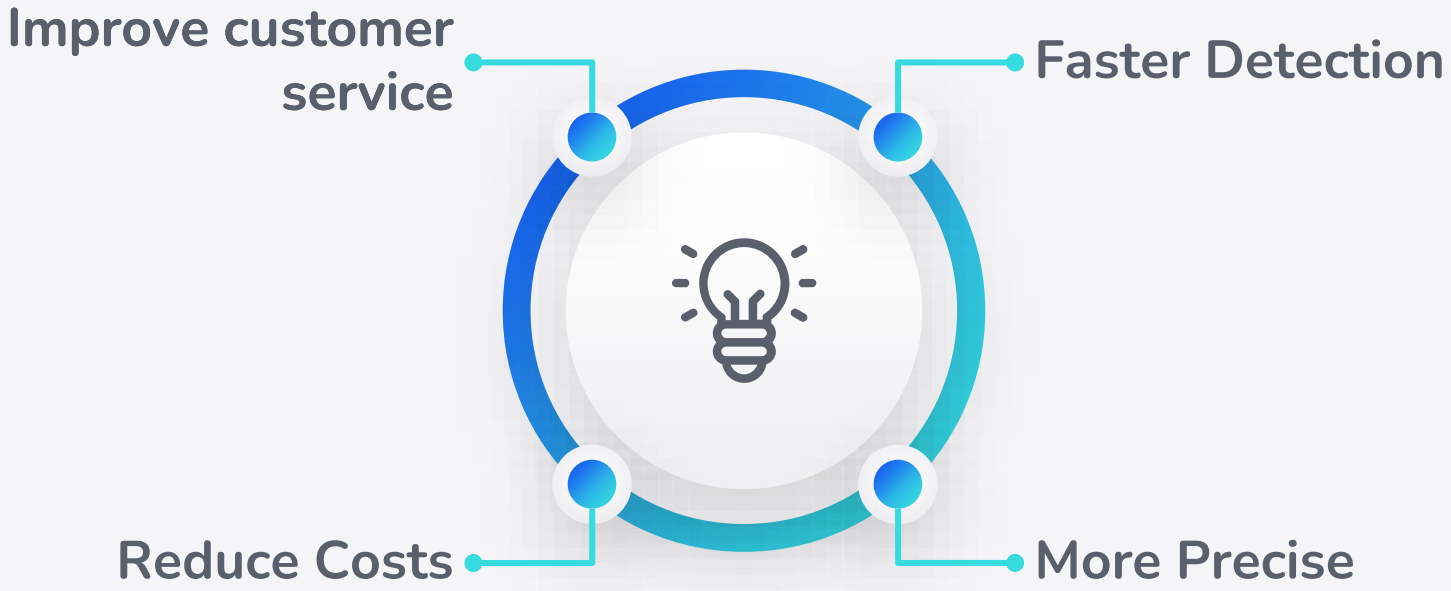
Negative impact :

- Financial Losses
- Customer Dissatisfaction
- Face regulatory penalties or sanctions for failing to prevent or report fraudulent activities.

Solution

Build the model detecting fraud in insurance claims with high efficiency

Why use the model detecting fraud?



Dataset:
https://drive.google.com/file/d/1q25one9oWQtkoMP5w8y_vcI5LENdlDoG/view?usp=sharing

	I	J	K	L	M	N	
aime	Sex	MaritalStatus	Age	Fault	PolicyType	VehicleCategory	V
1	Female	Single	21	Policy Holder	Sport - Liability	Sport	n
4	Male	Single	34	Policy Holder	Sport - Collision	Sport	n
2	Male	Married	47	Policy Holder	Sport - Collision	Sport	n
1	Male	Married	65	Third Party	Sedan - Liability	Sport	2
2	Female	Single	27	Third Party	Sport - Collision	Sport	n
1	Male	Single	20	Third Party	Sport - Collision	Sport	n
4	Male	Single	0	Policy Holder	Sport - Collision	Sport	n
5	Male	Single	30	Policy Holder	Sport - Collision	Sport	n
3	Male	Married	42	Policy Holder	Utility - All Perils	Utility	n
3	Male	Single	71	Policy Holder	Sedan - All Perils	Sedan	n
3	Male	Married	28	Policy Holder	Sedan - Liability	Sport	n
1	Male	Single	0	Third Party	Sedan - Collision	Sedan	n
1	Male	Married	61	Policy Holder	Sedan - Liability	Sport	n
5	Male	Single	38	Policy Holder	Sedan - Liability	Sport	n
1	Male	Married	41	Policy Holder	Sedan - All Perils	Sedan	n
1	Female	Married	28	Third Party	Sedan - Collision	Sedan	2
5	Male	Single	32	Policy Holder	Sedan - Liability	Sport	2
1	Male	Married	30	Third Party	Sedan - Liability	Sport	n
1	Male	Married	40	Policy Holder	Sedan - Liability	Sport	2
2	Male	Married	47	Policy Holder	Sedan - Collision	Sedan	2
5	Male	Married	63	Policy Holder	Sedan - Liability	Sport	2
3	Male	Single	31	Third Party	Sedan - Liability	Sport	3
3	Male	Married	45	Policy Holder	Sedan - All Perils	Sedan	n
1	Male	Married	60	Policy Holder	Sedan - Liability	Sport	2
4	Male	Married	21	Policy Holder	Sedan - Collision	Sedan	3
4	Male	Married	42	Policy Holder	Sedan - All Perils	Sedan	3
4	Male	Single	0	Policy Holder	Sedan - All Perils	Sedan	n
4	Female	Married	39	Policy Holder	Sedan - Collision	Sedan	2
2	Male	Married	47	Policy Holder	Sedan - Collision	Sedan	3
2	Male	Single	0	Policy Holder	Sedan - Collision	Sedan	n

All processes and more details:
Folder - Fraud Claim Detection

02 Business Model Canvas (BMC)

Key Partners

Who are our key partners?
Who are our key suppliers?
Which key resources are we acquiring for them?

Key Activities

What key activities do our value propositions require?
Our distribution channels?
Customer relationships?
Revenue streams?

Key Resources

What key resources do our value propositions require?

Value Proportions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each customer segment?
Which customer needs are we satisfying?

Customer Relationship

What type of relationship does each of our customer segments expect us to establish and maintain with them?
Which ones have we established?

Channels

Through which channels do our customer segments want to be reached?
How are we reaching them now? How are our channels integrated?
Which ones work best?
Which ones are most cost-efficient? How are we integrating them with customer routines?

Customer Segments

For whom are we creating value? Who are our most important customers?

Cost Structure

What are the most important costs inherent in our business model?
Which key resources are the most expensive? Which key activities are the most expensive?

Revenue Streams

For what value are our customers really willing to pay? For what do they currently pay?
How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?

Key Partners

Key Partners

Who are our key partners?
Who are our key suppliers?
Which key resources are we acquiring for them?

Partnerships with

- Insurance and reinsurance companies to integrate the model into their existing systems
- Providers to access additional data sources for training the model
- Other companies in the insurance industry to expand the scope of the model and its predictions

Key Activities

- Creating and maintaining the fraud detection model
- Ongoing research and development to improve the model and stay ahead of the competition

Key Activities

What key activities do our value propositions require?
Our distribution channels?
Customer relationships?
Revenue streams?

Key Resources

Key Resources

What key resources do our value propositions require?

- Data scientists and engineers to develop and maintain the machine learning model
- Data sources for training the model and validating its accuracy

Value Proportions

- Reduce fraudulent claims in the insurance industry which can save time and money, including reducing premiums for customers
- Provide more accurate risk assessments for reinsurance companies
- Improve overall accuracy and efficiency of fraud detection in the industry

Value Proportions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each customer segment?
Which customer needs are we satisfying?

Customer Relationship

Customer Relationship

What type of relationship does each of our customer segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

- Build trust with their customers by ensuring that only legitimate claims are paid out
- Build trust and credibility with insurance and reinsurance companies

Channels

- The sales team that works directly with insurance and reinsurance companies to implement the model
- Online platform for insurance companies to access the model and its predictions

Channels

Through which channels do our customer segments want to be reached?
How are we reaching them now? How are our channels integrated?
Which ones work best?
Which ones are most cost-efficient? How are we integrating them with customer routines?

Customer Segments

Customer Segments

For whom are we creating value?
Who are our most important customers?

- Insurance companies that are at risk of fraudulent claims
- Reinsurance companies that need to price risk accurately
- Customers who may benefit from reduced premiums due to fewer fraudulent claims

Cost Structure

e.g.

- Salaries and benefits for employees
- Cloud infrastructure costs for hosting and the model and its data
- Marketing and sales expenses
- Research and development costs for ongoing improvements to the model

Cost Structure

What are the most important costs inherent in our business model?
Which key resources are the most expensive? Which key activities are the most expensive?

Revenue Streams

Revenue Streams

For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each revenue stream contribute to overall revenues?

- Subscription fees for insurance companies to access the model and its predictions
- Revenue sharing with reinsurance companies based on the improved risk assessments
- Consulting fees for additional services related to fraud detection

03 Business Model

Types of Business Models

- Subscription model
- Pay-per-use model
- Licensing model
- Consulting model
- Value-added services model

Subscription model

Under this model, you could charge insurance companies a recurring subscription fee to access your fraud detection model. This could be based on the number of claims processed each month or year or a flat rate based on the size of the insurance company

Pay-per-use model

Alternatively, you could charge insurance companies a fee for each claim that is processed using your model. This could be based on the complexity of the claim and the level of risk associated with it

Licensing model

Under a licensing model, you could license your fraud detection model to insurance companies for a one-time fee or an ongoing royalty. This would allow them to use the model in-house, rather than relying on a third-party service

Consulting model

Another option would be to offer consulting services to insurance companies , where you would work with them to develop a customized fraud detection solution based on their specific needs and data. This could be a one-time project or an ongoing engagement

Value-added services model

Finally, you could offer value-added services to insurance companies in addition to your fraud detection model, such as data analytics, risk assessment, or fraud prevention training, This could help differentiate your offering and provide additional revenue streams

04

Conclusion

Summary main points

1. Our solution which solved fraudulent claims is building the machine learning model for fraud detection that has many advantages such as reduced costs, more precise
2. I tell you in detail about the business model which makes you know how to apply our solution to create business value or decrease fraud risk

Thanks

If you have any questions
Don’t hesitate to contact me

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