Project Design Phase-I
Proposed Solutions

Date	19 September 2022
Team ID	PNT2022TMID03433
Project Name	Project - Intelligent Vehicle Damage Assessment & Cost Estimator for Insurance Companies
Maximum Marks	2 Marks

Proposed Solution :

Project team shall fill the following information in proposed solution.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Insurance firms frequently suffer losses because they are unable to accurately estimate the cost of damaged automobiles and they are unable to calculate the cost of damaged cars precisely, insurance companies regularly incur losses.
2.	Idea / Solution description	We are creating an AI model to sense and detect the precise amount of automobiles damage.
3.	Novelty / Uniqueness	Automated calculator for the cost of filing an insurance claim.
4.	Social Impact / Customer Satisfaction	Determining the extent of vehicle damage and offering insurance accordingly.
5.	Business Model (Revenue Model)	Underwriting and investment income are the main sources of income for insurers. Financial investments, including listed shares, government bonds, commercial real estate, and corporate bonds, make up the majority of insurance firms' assets. By estimating the level of car damage using our AI model and providing insurance in accordingly, they are able to save more money and invest it in their own businesses.
6.	Scalability of the Solution	Our artificial intelligence (AI) has the capacity to operate at the scale, speed, and complexity required for the aim. Our model's accuracy will improve with more testing and training using real-time data.

Novelty :

A collection of ML algorithms with an API that makes use of computer vision make up the Car Damage Recognition system. The algorithms, which are based on deep learning, automatically identify the body of a car and assess the severity of the damage. The analysis process can be accelerated by up to seconds using parallel machine learning and analytical pipelines.

- Identify an automobile.
- Choose the car's components.
- Calculate the cost and preliminary damage to the car's components.

30 seconds for submitting a claim. Machine learning makes it possible to identify damaged auto parts, access damage, anticipate the type of repair that will be required, and calculate the potential cost of the repair.

Feasibility Of Ideas :

Companies can offer users an automatic examination of automotive damage thanks to a collection of tools and procedures called car damage assessment. It's crucial since it enables quick damage assessments and repair cost estimates without the need to wait for an inspector.

The installation of the required machine learning algorithms and the relevant training data have made vehicle damage detection possible. The following steps are necessary for each insurance claim to be processed:

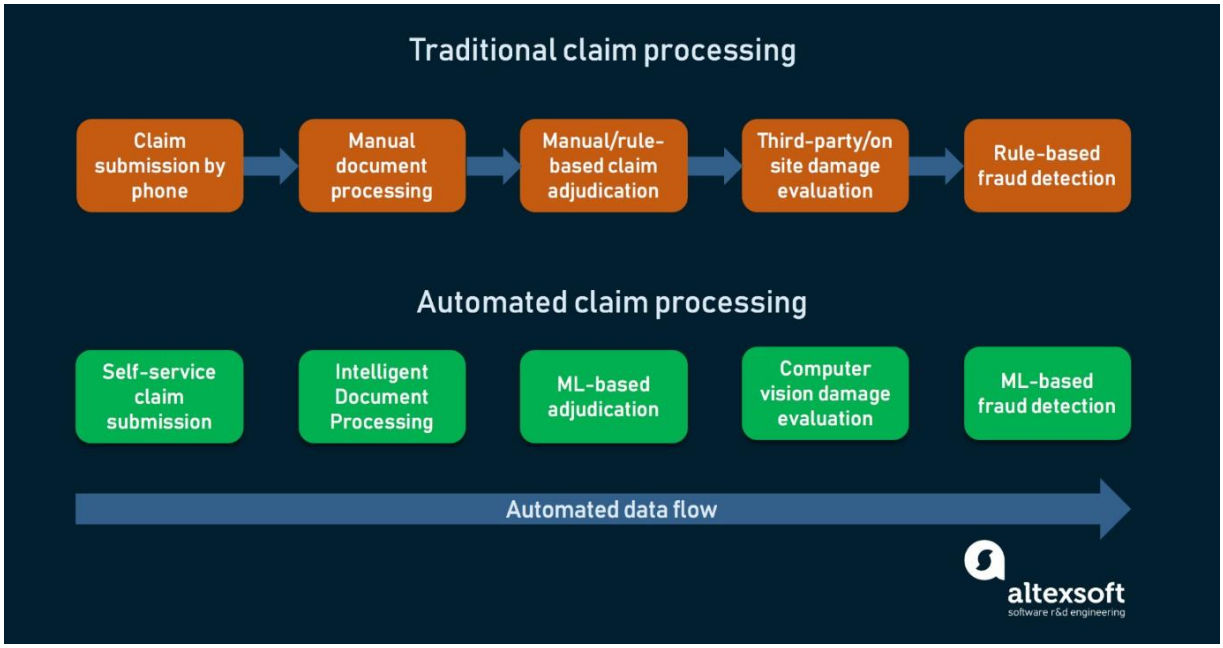
- Analyze the user-submitted image of the damaged car.
- Examine a vehicle model.
- Consider the angle at which the car is traveling.
- Find faulty auto parts.
- Evaluate the extent of component damage.
- Produce a report.

Framework for Car-Damage-Detection Algorithms:

The system for segmenting and detecting vehicle damage was developed in this paper using the Mask RCNN model. The graphic illustrates how an image of the damaged area of the car is chosenand gathered in accordance with the requirements, and the data annotated using theLabelMe annotation tool to create a dataset in the json format that is split into a training set and test.

Business Model :

The approach reduces the amount of time it takes to process data, protects against form fraud (by 80% or more), lowers the cost of hiring new employees, and occasionally speeds up image data analysis. The application is utilized on-site and directs the user's actions to fulfill the photo requirements. Businesses that use Car Damage Recognition replace the time-consuming, human-operated claims processing and approval procedure with analytical technologies and machine learning algorithms.



Scalability :

enables the scaling of the claim settlement process utilizing an automated framework based on cutting-edge methods and algorithms. The ability to rapidly and affordably fix the faults the system detects benefits insurance companies, car rental businesses, and auto repair shops. We used a number of strategies that had significantly better results than the traditional ones to increase accuracy and speed up the training process. It is crucial to identify the ideal learning rate area because it has a significant impact on the network's efficiency and speed. By increasing the learning rate until the loss stops dropping, as described by Leslie N. Smith's method, a good learning rate bound can be determined. Then, by estimating "acceptable boundaries," we select an ideal learning rate.

They must have the ability to swiftly evaluate and analyze data from multiple sources and offer precise estimates. Analysis and estimation of health harm, medical services, and other factors are also necessary. The client relationships and the reputation of the business will suffer from inaccurate and delayed estimations. You pay for your driving since machine learning-enhanced solutions assist in monitoring drivers' conduct.