TABLE OF CONTENTS

CHAPTER – 1
INTRODUCTION

1.1 PROJECT OVERVIEW

Recommendation system is a technique, which provides users with information, which he/she may be interested in or accessed in the past. Traditional recommender techniques such as content and collaborative filtering used in various applications such as education, social media, marketing, entertainment, e-governance and many more. Content-based and collaborative filtering has many advantages and disadvantages and they are useful in specific applications. Sparsity and cold start problems are major challenges in content and collaborative filtering. Challenges of content and collaborative filtering can be solved by using hybrid filtering. Hybrid filtering combines the features of two recommender systems like content and collaborative; content-based filtering improves the classification accuracy and collaborative model easily gives the best-predicted result of a latent factor model.

1.2 PURPOSE

It is used for detecting the exact cost for the damage occurred in an accident So it is helpful to avoid loss of cost for the insurance companies.There are many ways to claim insurance for the damaged vehicle but it may not be accurate all the time and it also takes long time for processing and providing insurance and Detect the cost for the only given dataset. The claiming process will take long time.Only able to predict the cost for the damage.

CHAPTER - 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM

There are many ways to claim insurance for the damaged vehicle but it may not be accurate all the time and it also takes long time for processing and providing insurance and Detect the cost for the only given dataset. The claiming process will take long time.Only able to predict the cost for the damage.

2.2 SURVEY WORK

2.2.1Research on Intelligent Vehicle Damage Assessment System Based on Computer Vision (2020)

Author: Zhu QianqianGuo Weiming, shen Ying and Zhao Zihao

At present, underneath the steerage of the new generation of data technology, the rapid accumulation of information, the continual improvement of computing power, the continual optimization of rule models, and therefore the fast rise of multi-scene applications have created profound changes within the development surroundings of computer science. During this paper, based on the demand of insurance claims and intelligent transportation, combined with copious basic information and advanced machine vision rules, an Associate in Nursing intelligent injury determination system of 'Artificial Intelligence + Vehicle Insurance' is made. This paper first introduces the functions of the intelligent injury assessment system. Secondly, it discusses the belief path of every purposeful module very well, and at last puts forward the vision for the long run.

2.2.2 Automatic Emergency Braking (AEB) System Impact on

Fatality and Injury Reduction in China (2020)

Author: Hong Tan, Fuquan Zhao, Han Hao, Zongwei Liu, Amer Ahmad Amer and Hassan Babiker.

The automatic emergency braking (AEB) system is an efficient intelligent vehicle active safety system for avoiding certain varieties of collisions. This study develops a national-level safety impact analysis model for this intelligent vehicle perform, as well as the potential most impact and realistic impact. The analysis model was first applied in China to supply insights into Chinese policymaking. Road traffic fatality and severe injury trends, the proportion of various collision varieties, the effectiveness of collision turning away, and also the AEB penetration rates square measure considered within the potential most impact situation. What is more, the AEB activation rate and also the technology's technical limitations, as well as its effectiveness in several weather, light, and speed conditions, square measure mentioned within the realistic situation. With a 100% penetration rate, fatalities might be reduced by thirteen.2%, and injuries can be reduced by nine.1%. supported China's policy, the market penetration rate of intelligent vehicles with AEB is foretold to be thirty four.0% in 2025 and sixty.3% in 2030.

2.2.3 Automatic Car Damage Assessment System: Reading and Understanding Videos as Professional Insurance Inspectors (2020)

Author: Wei Zhang, Yuan Cheng, Xin Guo,Wei Chu

We demonstrate an automotive harm assessment system in the automotive insurance field supported by computer science techniques, which can exempt insurance inspectors from checking cars on websites and facilitate folks with not skilled data to evaluate automotive damages once accidents happen. Unlike existing approaches, we tend to utilize videos rather than photos to act with users to form the full procedure as easy as possible. We adopt object and video detection and segmentation techniques in laptop vision, and cash in multiple frames extracted from videos to realize high harm recognition accuracy. The system uploads video streams captured by mobile devices, acknowledges automotive harm on the cloud asynchronously and then returns broken elements and repair prices to users. The system evaluates automotive damages and returns results automatically and effectively in seconds, which reduces laboratory prices and reduces claim time considerably**.**

2.2.4 Car Damage Detection and Classification (2020)

Author: Phyu Mar Kyu, Kuntpong Woraratpanya

The proliferation of automobile industries is directly related to the increasing variety of automobile incidents. So, insurance companies face many synchronous claims and determination claims escape. The sense of AI (AI)supported machine learning and deep learning algorithms can facilitate the styles of disadvantage for insurance industries. Throughout this paper, we are using deep learning-based algorithms for car hurt detection and assessment in real-world datasets. The algorithms notice the broken area of an automobile and assess its location thus its severity. Initially, we tend to tend to get the impact of domain-specific pre-trained CNN models, that unit trained on an Image Net dataset, and followed by fine-tuning, as a results of some of the categories is fine-granular to urge our specific tasks.Then we tend to tend to use transfer learning in pretrained VGG models and use some techniques to boost the accuracy of our system. We achieve the accuracy of ninety 5.22% of VGG19 and ninety four.56% of VGG16 in the broken detection, the accuracy of seventy six.48% of VGG19 and 74.39% of VGG16 in hurt localization, the accuracy of fifty eight.48% of VGG19 and fifty four.8% of VGG16 in hurt severity. From their results, the performance of VGG19 is best than VGG16. After analyzing and implementing our models, we tend to discover that the results of victimization transfer learning and L2 regularization can work over those of fine-tuning.

2.2.5 A Unified Framework of Intelligent Vehicle

Damage Assessment based on Computer Vision Technology (2019)

Author : Xianglei Zhu, Sen Liu, Pen Zhang, Yihai Duan

Due to the event of deep learning, in recent years, the sphere of laptop vision has grown quickly. A large amount of laptop vision technologies are applied in actual issues. At present, the trade of auto harm assessment needs plenty of men, and new automatic intelligent harm assessment technology will greatly scale back industrial prices. During this paper, a framework of intelligent vehicle harm assessment formula supported object detection technology and image classification technology is planned. This formula will mechanically determine the harm position, type and degree per photos provided by

users, so as to offer applicable maintenance value and reach the accuracy that can meet actual application needs

2.2.6 A Very Deep Transfer Learning Model for Vehicle Damage Detection and Localization (2019)

Author : Najmeddine Dheieb, Hakim Ghazzai, Hichem Besbes

Claims escape could be a major drawback engendering tremendous losses for insurance firms. Those losses are unit due to the distinction between the number paid by insurance companies and therefore the precise quantity that ought to be spent, which cost numerous bucks yearly. consultants assert that these losses are a unit caused by inefficient claims process, frauds, and poor decision making within the company. With the large advances in Artificial Intelligence , machine and deep learning algorithms, those technologies have started getting used in insurance trade to solve such issues and deal with their negative consequences. In this paper, we have a tendency to propose machine-driven and economical deep learning-based architectures for vehicle injury detection and localization. The planned resolution combines deep learning, instance segmentation, and transfer learning techniques for options extraction and injury identification. Its objective is to mechanically observe damages in vehicles, find them, classify their severity levels, and visualize them by contouring their precise locations.

2.2.7 Deep Learning Based Car Damage Classification and Detection (2020)

Author : Hashmat Shadab Malik, Mahavir Dwivedi, S.N. Omakar

In this paper, we have a tendency to design and enforce an automotive injury classification/detection pipeline, which might be employed by insurance companies to modify the method of car insurance claims. The recent advances in pc vision mostly

because of the adoption of quick, scalable and finish to finish trainable Convolutional Neural Networks(CNN's) makes it technically possible to acknowledge vehicle damages exploitation of deep convolutional networks. we have a tendency to manually collected and annotated pictures from numerous on-linesources exploitation net crawler containing differing kinds of car damages.Due to the comparatively little size of our dataset, we have a tendency to used models pre-trained on an outsized and numerous dataset to avoid overfitting and learn additional general features. exploitation CNN models pre trained on ImageNet dataset and applying preprocessing techniques to boost the performance of our system, we were able to come through accuracy of ninety six.39%, considerably higher than results achieved within the past on an identical test-set. What is more, to sight the region of damage we have a tendency to use progressive YOLO object detectors and achieving a maximum map score of seventy seven.78 you choose the held-out take a look at set, demonstrating that the model was able to with success recognise completely different vehicle damages. Overall these results pave the means for more research during this drawback domain and that we believe an assortment of an additional diverse dataset would be comfortable to implement an automatic vehicle damage identification system within the close to future.

2.3 PROBLEM STATEMENT DEFINITION

Problem Statement (PS)	I am (Customer)	I'm tryingto	But	Because	Which makesme feel
PS-1	Insurance Company	To identify the damage exactly	I have lotof other commitments	Dealing withlot of customers	Complicatedwork
PS-2	Car Owner	To identify the accurate cost of damage occurred	I don't know how to calculate the cost of damage	I don't knowhow deeply detect the damages occurred	Confused
PS-3	Bike Owner	To identify the accurate cost of damage occurred	I don't know how to calculate the cost of damage	I don't know how to detectthe damages occurred	Confused

CHAPTER -3

IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

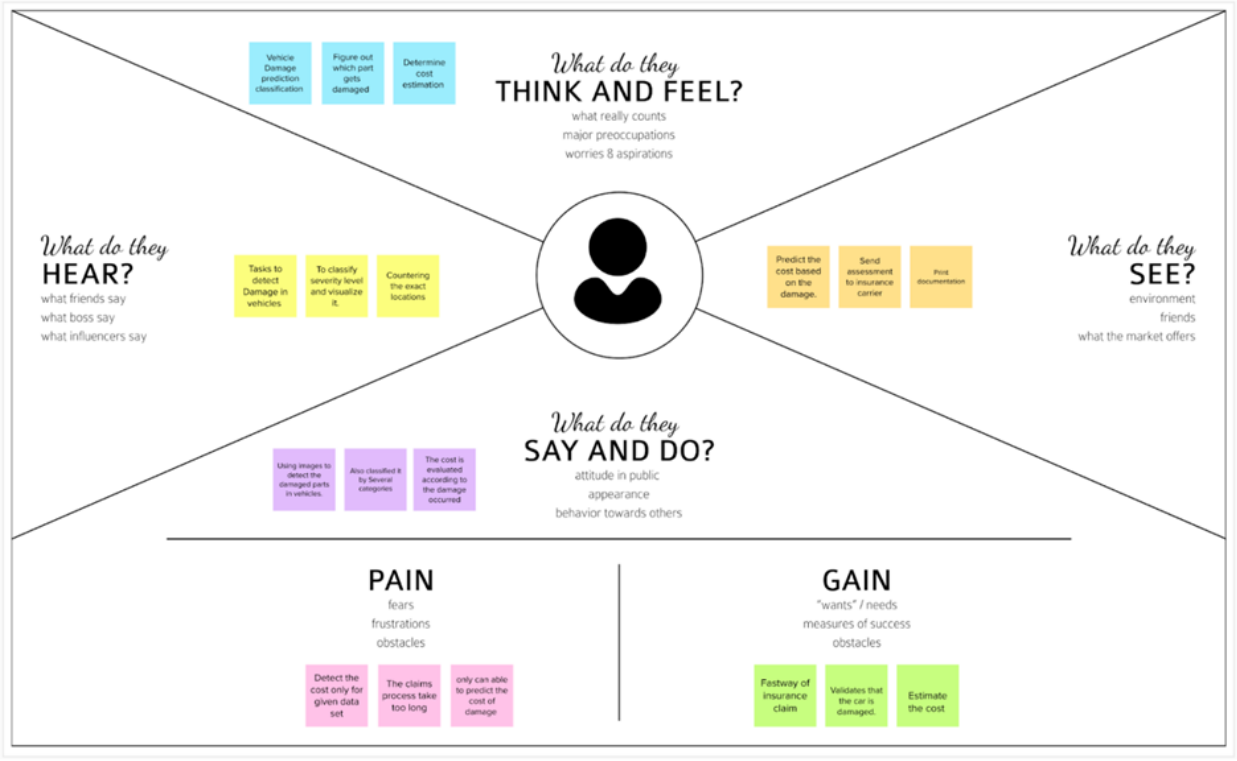


Fig 3.1 Empathy Map canvas

3.2 IDEATION & BRAINSTORMING

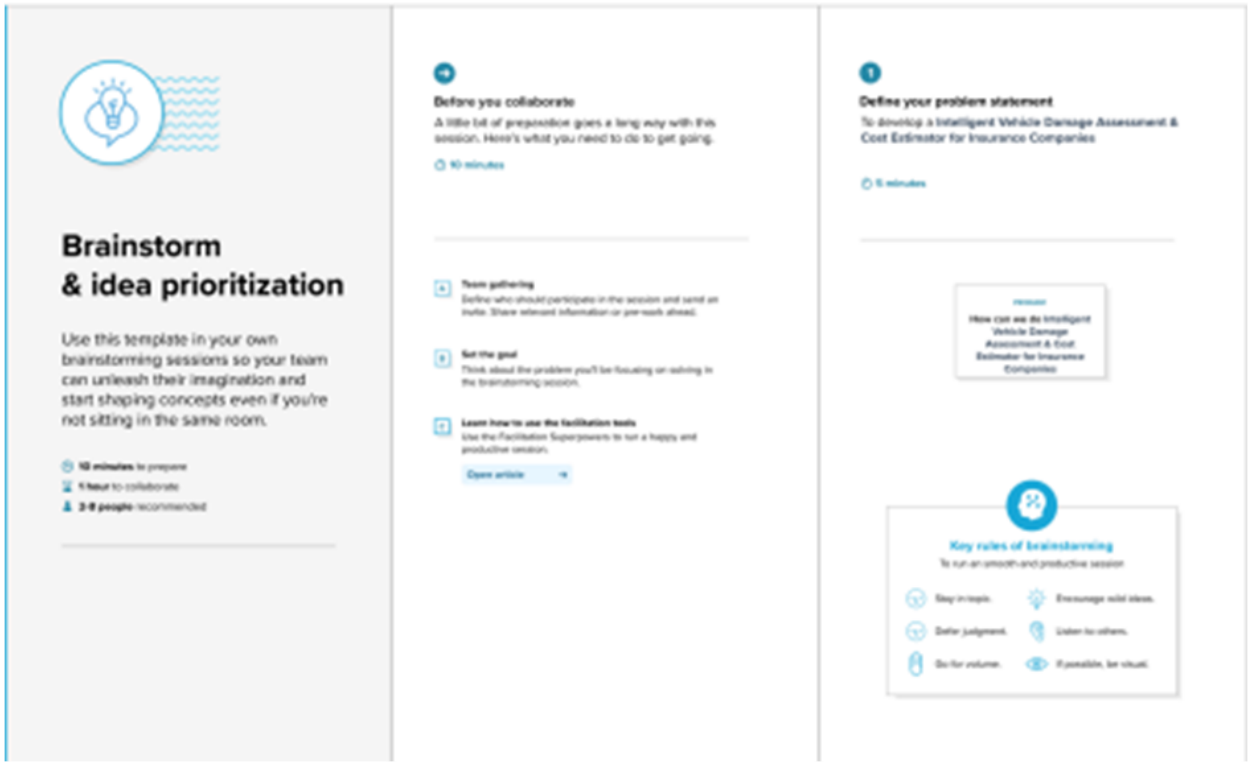


Fig 3.2 (A) Brainstorming And Idea Prioritization

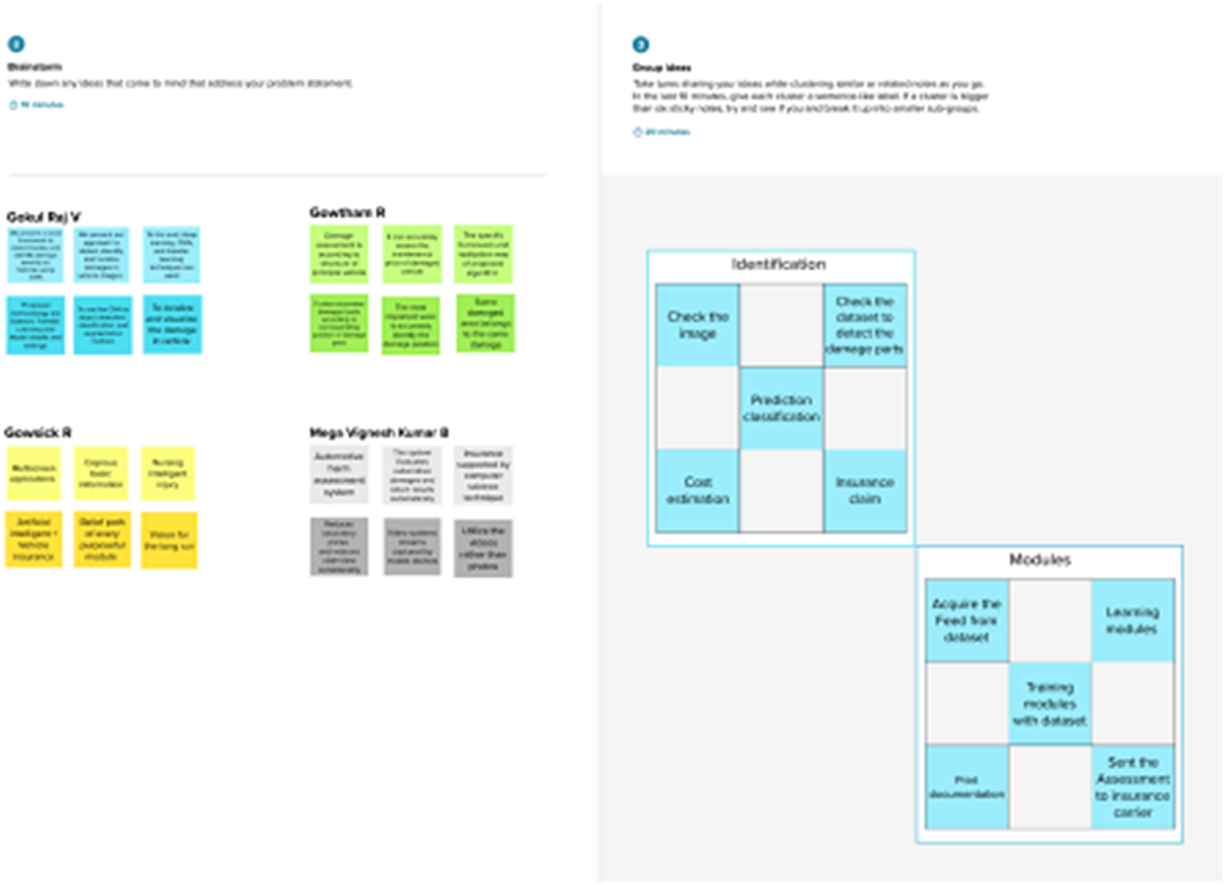


Fig 3.2 (B) Brainstorming And Idea Prioritization

Fig 3.2 (C) Brainstorming And Idea Prioritization

3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	To develop an Intelligent Vehicle Damage Assessment & Cost Estimator for Insurance Companies.
2	Idea / Solution description	Estimate the cost of damage due to the accident. Easy way to claim the insurance. It contains several categories to detect the damage.
3	Novelty / Uniqueness	Locating the damage occurred at a place with accordance to the specific cost of the damage. It find the exact damaged location to predict the cost. Its objective is to mechanically observe damages in vehicles, find them, classify their severity levels, and visualize them by contouring their precise locations.
4	Social Impact / Customer Satisfaction	Easy to predict the accurate cost for the damage Everyone gets the exact details for their damage. AI has proved its efficiency in fraud detection for suspected collusion claims.
5	Business Model (Revenue Model)	The Algorithms notice the broken area of an automobile and assess its location thus its severity.
6	Scalability of the Solution	AI detects the accurate damaged area and predicts their cost to insure.

3.4 PROBLEM SOLUTION FIT

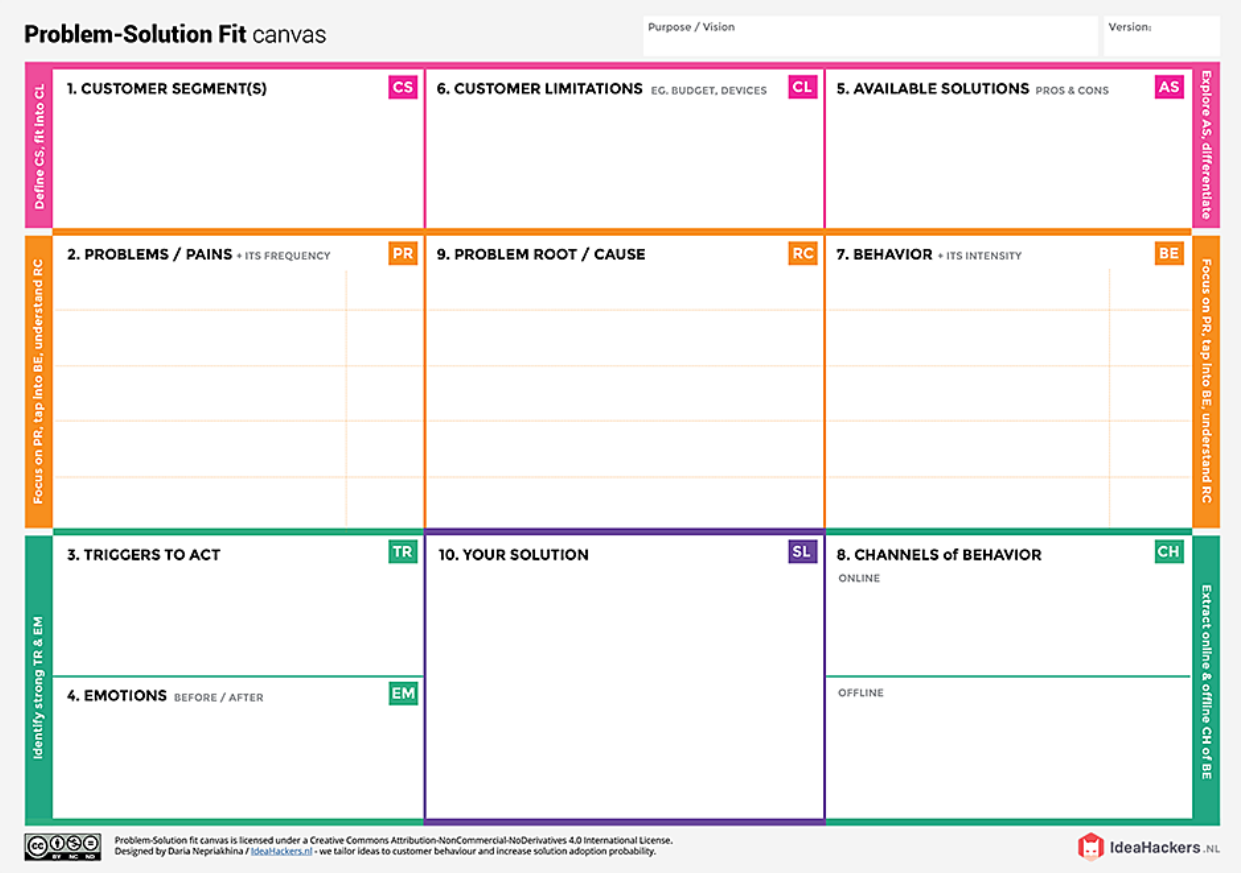


Fig 3.4 Problem Solution Fit

Chapter-4

REQUIREMENTS ANALYSIS

4.1 Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through phone number
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User dashboard	Single Sample Prediction Multiple Sample Prediction View User History

4.2 Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	To predict the cost for the exact damaged parts of the vehicle.
NFR-2	**Security**	It is secure to claim the insurance from the company with efficiency.
NFR-3	**Reliability**	It can detect the damage from all parts of the vehicle.
NFR-4	**Performance**	Detect the damages of any kind of vehicle, It may be minor or major damage.
NFR-5	**Availability**	It is accessible for both insurance company and vehicle owner to estimate the cost of damage.
NFR-6	**Scalability**	To measure the accurate cost for the damage of vehicle.

CHAPTER-5
PROJECT DESIGN

5.1 DATA FLOW DIAGRAM

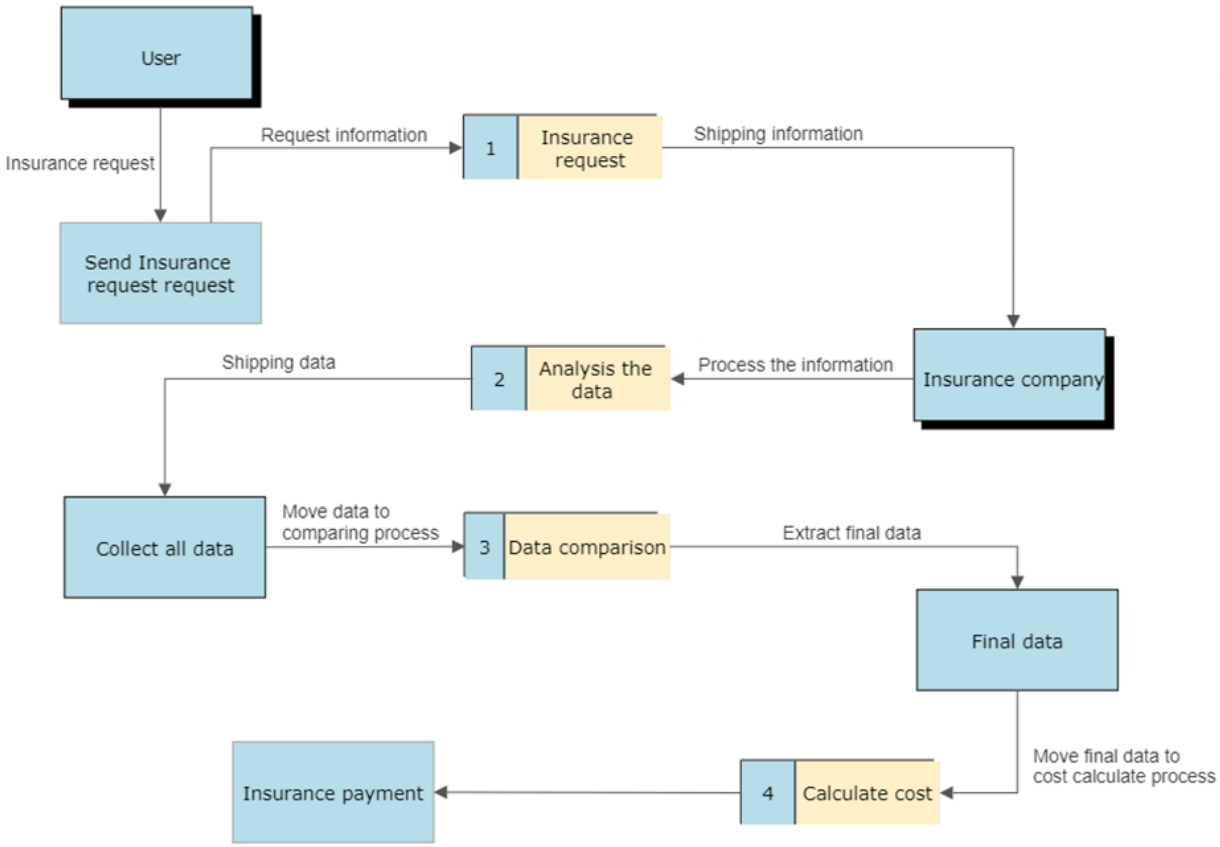


Fig 5.1 Data Flow Diagram

5.2(A) SOLUTION ARCHITECTURE

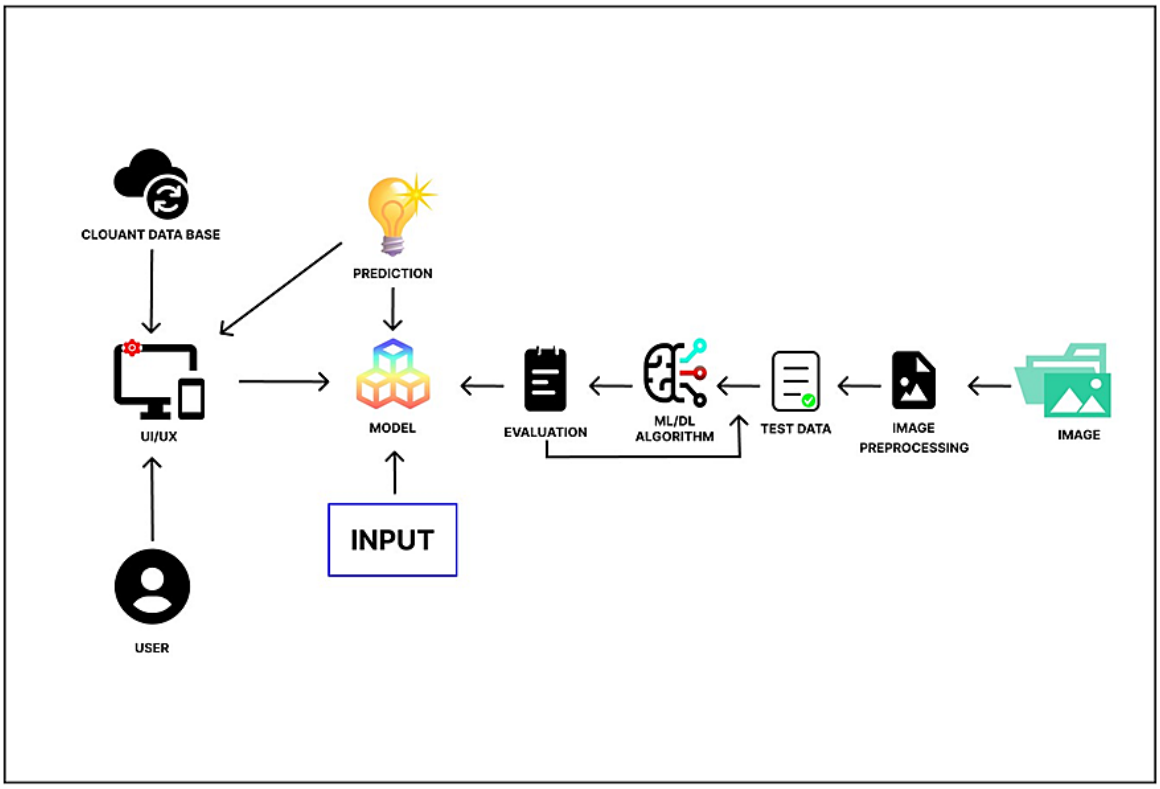


Fig 5.2(A) Solution Architecture

5.2(B) TECHNOLOGY ARCHITECTURE

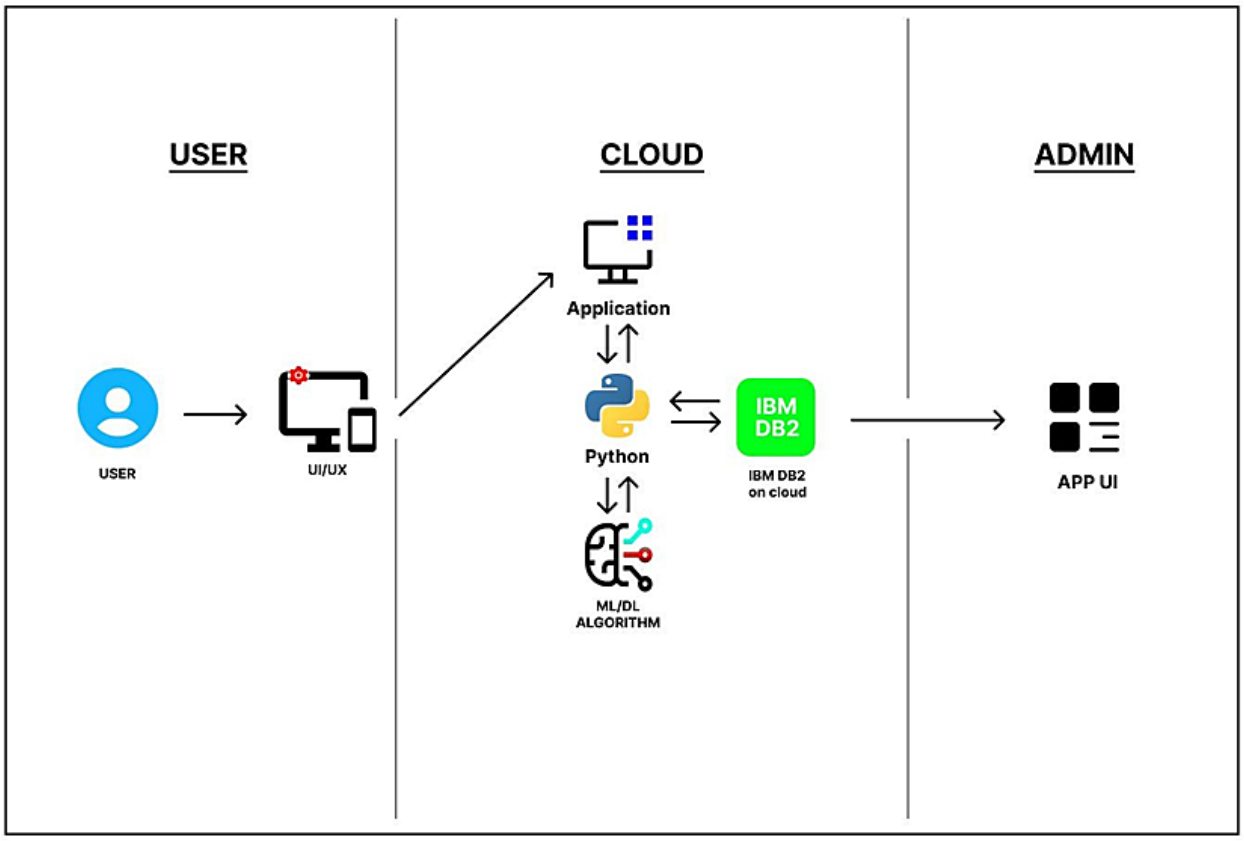


Fig 5.2(B) Technology Architecture

5.3 USER STORIES

User Type	Functional Requirement(Epic)	User StoryNumber	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user,I canregister for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I willreceive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user,I canregister for the application through Gmail	I can receive confirmation on Gmail & click confirm	Medium	Sprint-1
	Login	USN-4	As a user, I can log into the application by entering email& password		High	Sprint-1
	Dashboard	USN-5	As a user,I canview all the plans and methods in dashboard		High	Sprint-1

Customer (Webuser)	Insuranceclaim	USN-6	As a user, I can register for claimmy insurance	I can receive confirmation email & claim my insurance	High	Sprint-2
Customer Care Executive	Q/A services	USN-7	As a user, I can make a call to support line toget help with a product or service.	Phone call, messagesand Email	High	Sprint-3
Administrator	Insurance	USN-8	As a user, I can claim my insurance aftergetting confirmation from the administrator.	I can accept the insurance after verified the documents	High	Sprint-3

CHAPTER - 6
PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	7	High	Gowtham R
		USN-2	As a user, I will receive confirmation emailonce I haveregistered for the application	3	Medium	Gowsick R
	Login	USN-3	As a user, I can log into the application by entering email& password	2	Medium	Gokul Raj V
Sprint-2	Dashboard	USN-4	As a user, I can givepersonal informations for check my insurance details	6	Medium	Gowsick R

		USN-5	As a user, I can Connectwithan Expert to choose my Insurance Plan	5	Medi um	Mega Vignesh kumarB
Sprint-3	Apply	USN-6	As a user, I can give myvehicle details forclarification	5	High	Gokul Raj V
		USN-7	As a user, I can uploada input image to get prediction result and insurance claims	9	High	Mega Vignesh KumarB
Sprin t-4	Result	USN-8	As a user, I getthe prediction costbased on the vehicle damage	10	High	Gowtham R

6.2 SPRINT DELIVERY SCHEDULE

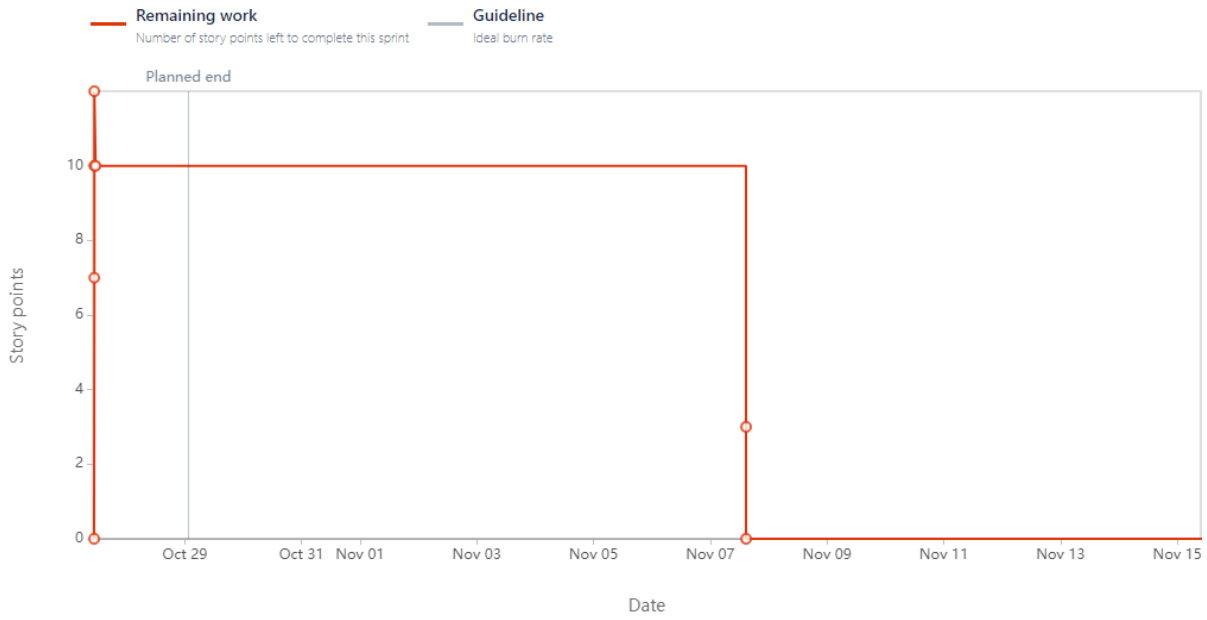
Project Tracker, Velocity& Burndown Chart:(4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint ReleaseDate (Actual)
Sprint-1	12	6 Days	27 Oct 2022	29 Oct 2022	12	29 Oct 2022
Sprint-2	11	6 Days	13 Nov 2022	15 Nov 2022	11	15 Nov 2022
Sprint-3	14	6 Days	15 Nov 2022	17Nov 2022	14	17 Nov 2022
Sprint-4	10	6 Days	15 Nov 2022	19 Nov 2022	10	19 Nov 2022

6.3 REPORT FROM JIRA

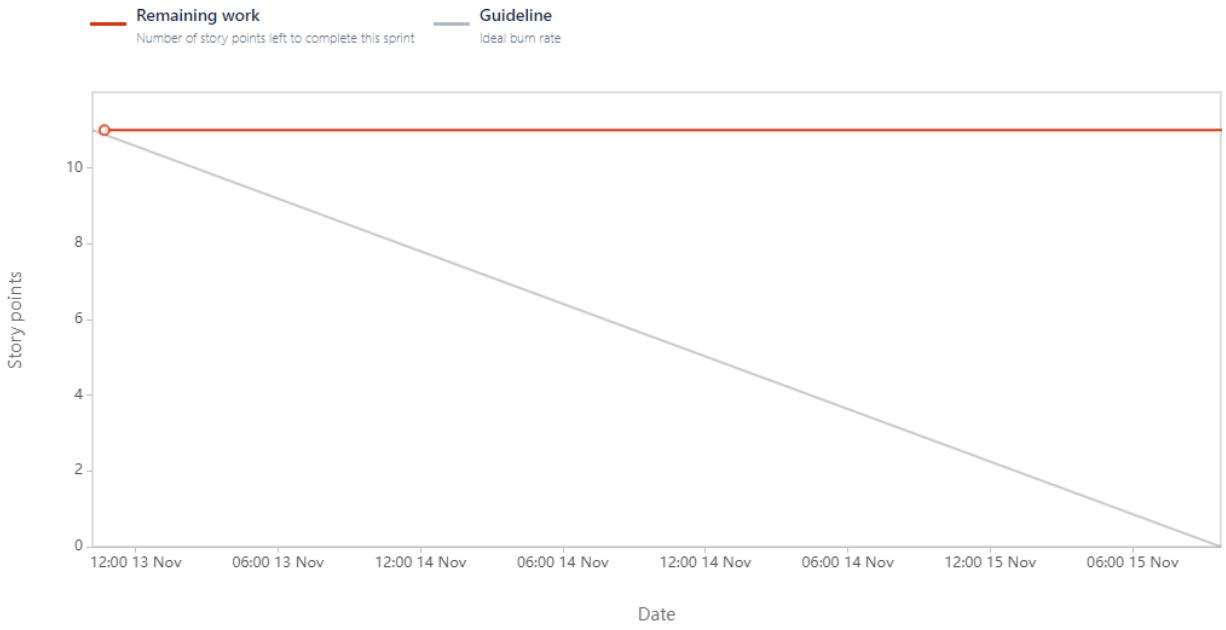
SPRINT 1

Date - October 27th, 2022 - October 29th, 2022

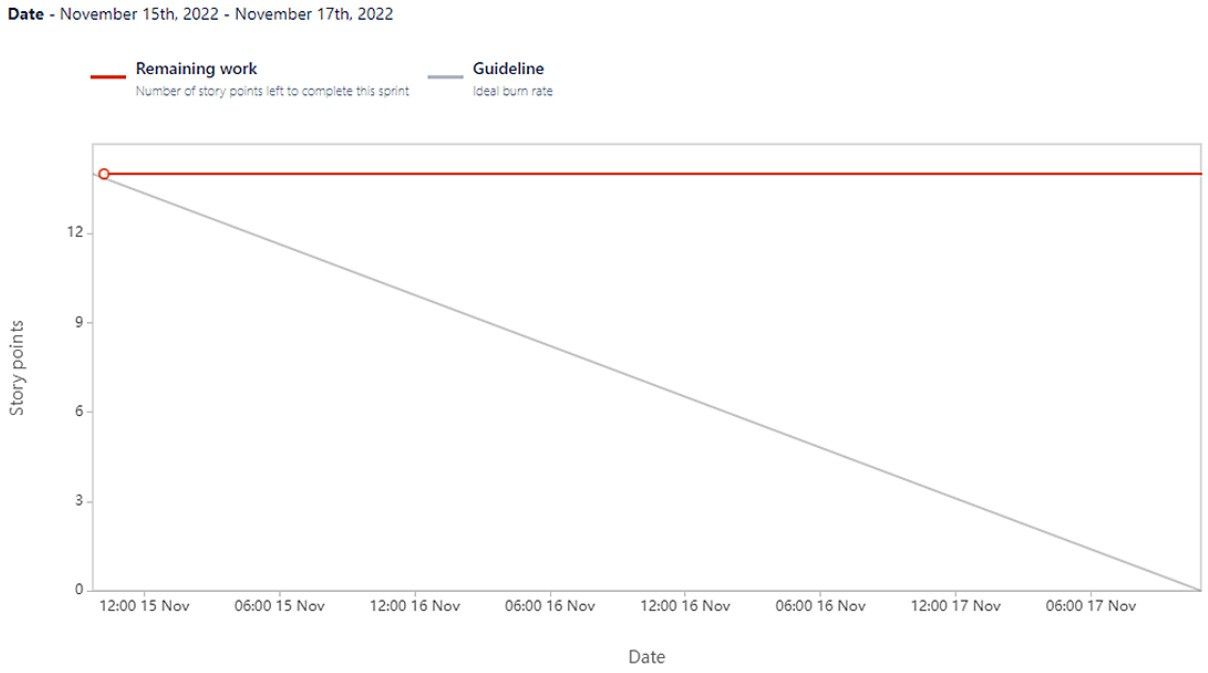


SPRINT 2

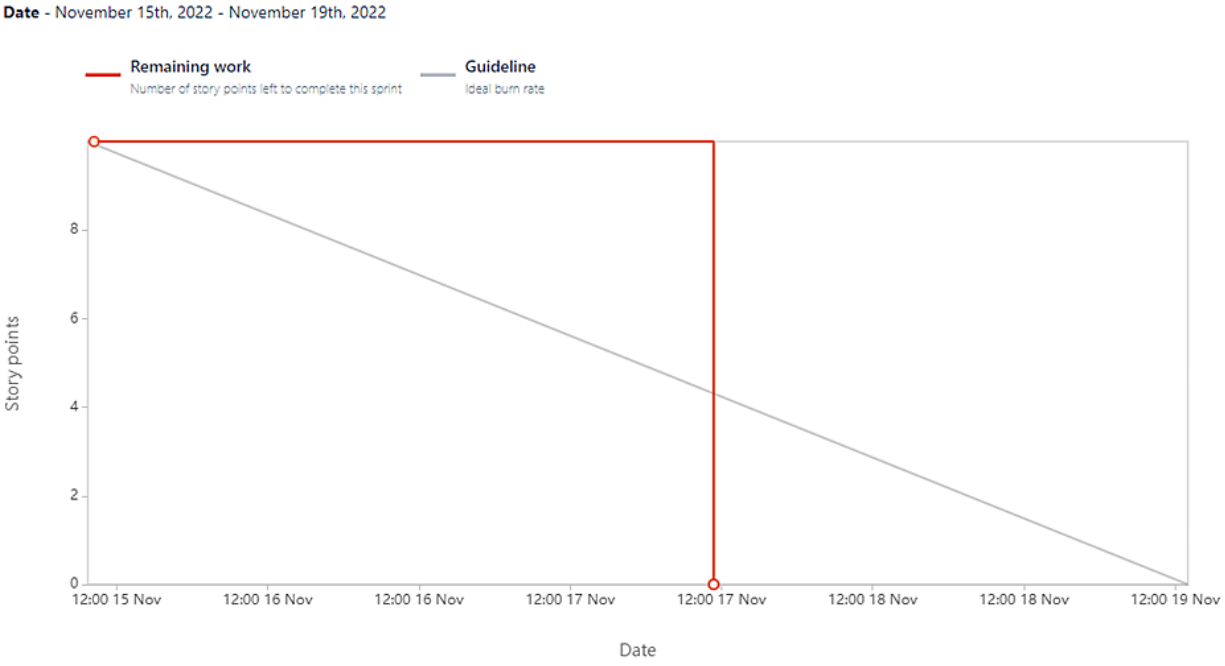
Date - November 13th, 2022 - November 15th, 2022



SPRINT 3



SPRINT 4



CHAPTER- 7

CODING & SOLUTIONING

7.1 FEATURE 1

The field of Computer Vision is yet developing and not mature enough to deal with modular phone camera quality images. Angle, lighting, resolution are factors that can easily cause major disruptions in image classification.Car insurance settlement claims require near perfect accuracy to ensure the customer is not frauded in the process. Such models would be required to be trained on humongous datasets which are highly difficult to procure.

7.2 FEATURE 2

To run such heavy datasets to ensure maximum accuracy would be imposed by hardware restriction. Storing, training and deploying such heavy datasets over the cloud would require expensive architecture.While the computer can avoid human errors, there are often situation that would require such a model to flag for human assistance.Systems running on the Cloud, especially those dealing monetary data are also heavily susceptible to cyber risks and require heavily structured frameworks to ensure customer data security.Such a process will require a certain level of manual control and filter to avoid flooding of fraudulent insurance claims.

CHAPTER - 8

TESTING

8.1 TEST CASES

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	Executed By
Registration page_TC_001	Functional	Home Page	Select create new account and enter the name,e mail and password to register	1.Click create new account 2.Enter username 3.Enter valid email id 4.Enter password	http://127.0.0.1:8080	Account created	Enters the home screen	Pass	Login successful	no	GokulRaj.V
LoginPage_TC_002	Functional	Home Page	Enter user mail id and password to login	1.Enter valid email id 2.Enter password	http://127.0.0.1:8080	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Pass	Steps are not clear to follow	no	Gowtham.R
Prediction page_TC_003	UI	Prediction page	Choose an image and upload the image	1.Click the choose file in prediction page 2.upload the image file 3.Click submit button	http://127.0.0.1:8080	Application should show prediction page		Pass		no	Gowsick.R
Result_TC_004	Functional	Prediction page	User can obtain the exact cost from the uploaded image	After submission result will be shown	http://127.0.0.1:8080	Application should show cost for the damage in predction page		Pass		no	Mega vignesh Kumar.B
Logout Page_TC_005	Functional	Logout page	After the prediction user can logout their account	1.Click logout button 2.Successfully logout	http://127.0.0.1:8080	Application should show successfully logged out		Pass		no	Gowtham.R

8.2 USER ACCEPTANCE TESTING

1.Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2.Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity1	Severity2	Severity3	Severity4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won'tFix	0	5	2	1	8
Totals	24	14	13	26	77

3.Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	TotalCases	Not Tested	Fail	Pass
PrintEngine	7	0	0	7
ClientApplication	51	0	0	51
Security	2	0	0	2
OutsourceShipping	3	0	0	3
ExceptionReporting	9	0	0	9
FinalReportOutput	4	0	0	4
VersionControl	2	0	0	2

CHAPTER - 9

RESULT

9.1 PERFORMANCE METRICS

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot

1.	Model Summary	-	`model.summary()`
			`Model: "model_3"`
			Layer (type) — Output Shape — Param #
			input_5 (InputLayer) — [(None, 244, 244, 3)] — 0
			block1_conv1 (Conv2D) — (None, 244, 244, 64) — 1792
			block1_conv2 (Conv2D) — (None, 244, 244, 64) — 36928
			block1_pool (MaxPooling2D) — (None, 122, 122, 64) — 0
			block2_conv1 (Conv2D) — (None, 122, 122, 128) — 73856
			block2_conv2 (Conv2D) — (None, 122, 122, 128) — 147584
			block2_pool (MaxPooling2D) — (None, 61, 61, 128) — 0
			block3_conv1 (Conv2D) — (None, 61, 61, 256) — 295168
			block3_conv2 (Conv2D) — (None, 61, 61, 256) — 590080
			block3_conv3 (Conv2D) — (None, 61, 61, 256) — 590080
			block3_pool (MaxPooling2D) — (None, 30, 30, 256) — 0
			block4_conv1 (Conv2D) — (None, 30, 30, 512) — 1180160
			block4_conv2 (Conv2D) — (None, 30, 30, 512) — 2359808
			block4_conv3 (Conv2D) — (None, 30, 30, 512) — 2359808
			block4_pool (MaxPooling2D) — (None, 15, 15, 512) — 0
			block5_conv1 (Conv2D) — (None, 15, 15, 512) — 2359808
			block5_conv2 (Conv2D) — (None, 15, 15, 512) — 2359808
			block5_conv3 (Conv2D) — (None, 15, 15, 512) — 2359808
			block5_pool (MaxPooling2D) — (None, 7, 7, 512) — 0
			flatten_3 (Flatten) — (None, 25088) — 0
			dense_3 (Dense) — (None, 3) — 75267
			Total params: 14,789,955
			Trainable params: 75,267
			Non-trainable params: 14,714,688

2.	Accuracy	Training Accuracy - Validation Accuracy - 	

CHAPTER - 10

ADVANTAGES & DISADVANTAGES

ADVANTAGES

- Fastway of insurance claim.
- Validates the car is damaged.
- Estimates the exact cost for the damage.

DISADVANTAGES

- Detect the cost for the only given dataset.
- The claiming process will take long time.
- Only able to predict the cost for the damage.

CHAPTER - 11

CONCLUSION

In our project, we explore the innovation of insurance technology of 'AI + Vehicle Insurance'. We can use the power of intelligent damage determination system. On the one hand, the owner can take photos by one click to achieve rapid loss determination, price estimation and immediate compensation. On the other hand, it assists insurance companies to achieve rapid and accurate pricing in the process of fixing losses and claims. Finally, by combining the rapid compensation of accident vehicles to relieve traffic pressure, to avoid more serious personal and property losses caused by secondary accidents.

CHAPTER - 12

FUTURE SCOPE

AI and its related technologies will have a seismic impact on all aspects of the insurance industry, from distribution to underwriting and pricing to claims. Advanced technologies and data are already affecting distribution and underwriting, with policies being priced, purchased, and bound in near real time. An in-depth examination at what insurance may look like in 2030 highlights dramatic changes across the insurance value chain.The experience of purchasing insurance is faster, with less active involvement on the part of the insurer and the customer. Enough information is known about individual behavior, with AI algorithms creating risk profiles, so that cycle times for completing the purchase of an auto, commercial, or life policy will be reduced to minutes or even seconds. Auto and home carriers have enabled instant quotes for some time but will continue to refine their ability to issue policies immediately to a wider range of customers as telematics and in-home Internet of Things (IoT) devices proliferate and pricing algorithms mature. Many life carriers are experimenting with simplified issue products, but most are restricted to only the healthiest applicants and are priced higher than a comparable fully underwritten product. As AI permeates life underwriting and carriers are able to identify risk in a much more granular and sophisticated way, we will see a new wave of mass-market instant issue products.

CHAPTER - 13
APPENDIX

13.1 SOURCE CODE

```
import re
import numpy as np
import os
from flask import Flask, app, request, render_template, redirect
from tensorflow.keras import models
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
from tensorflow.python.ops.gen_array_ops import concat
from tensorflow.keras.applications.inception_v3 import preprocess_input
import requests
from flask import Flask, app, redirect, render_template, request, url_for

from cloudant.client import Cloudant

client = Cloudant.iam('0941a94e-25e5-4f75-9079-5dd257ff7931-
bluemix','D45bUG7nGt6FPKxu4fp5KSz8jLcBAoA3ZRxemtL__4Ru', connect=True)
my_database = client.create_database('my_database')

# client =Cloudant.iam("DATABASE=bludb;HOSTNAME=764264db-9824-4b7c-82df-
40d1b13897c2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;PORT=32536;PROTOCOL=T
CPIP;UID=zvg68201;PWD=YAxMH9HtQ1UoLD4E;SECURITY=SSL;")
# connection = ibm_db.connect(connectionstring, '', '')

model1 = load_model('level.h5')
model2 = load_model('body.h5')


app = Flask(__name__)


@app.route("/")
def signup():
    return render_template("Index.html")
```

```
@app.route("/login")
def signin():
    return render_template("login.html")


@app.route("/register")
def aboutus():

    return render_template("register.html")


@app.route("/Index")
def index():
    return render_template("Index.html")


@app.route("/home")
def home():
    return render_template("home_page.html")


@app.route("/prediction")
def prediction():
    return render_template("prediction.html")


@app.route("/log_out")
def logout():
    return render_template("log_out.html")


@app.route("/afterreg", methods=['POST'])
def afterreg():
    x = [x for x in request.form.values()]
    print(x)
    data = {
        'name': x[0],
        'email': x[1],
```

```
        'pass': x[2]
    }
    print(data)
    query = {'data': {'$eq': data}}
    docs = my_database.get_query_result(query)
    print(docs)
    print(len(docs.all()))
    if (len(docs.all()) == 0):
        url = my_database.create_document(data)
        # response = requests.get(url)
        return render_template('home_page.html', pred="Registration Successful")
    else:
        return render_template('login.html', pred="You are already a member,Please login using your
detials")


@app.route("/userlogin", methods=['GET', 'POST'])
def login():
    user = request.form['email']
    passw = request.form['password']
    print(user, passw)
    query = {'email': {'$eq': user}}
    docs = my_database.get_query_result(query)
    print(docs)
    print(len(docs.all()))
    if(len(docs.all())==0):
        return render_template('login.html', pred="Email not found")
    else:
        if((user==docs[0][0]['email'] and passw==docs[0][0]['pass'])):
            return render_template('home_page.html', pred="Login Successful")
        else:
            return render_template('login.html', msg="Enter Password")


@app.route('/result', methods=["GET", "POST"])
def res():
    if request.method == "POST":
        f = request.files['image']
        # getting the current path i.e where app.py is present #print("current path", basepath)
        basepath = os.path.dirname(__file__)
```

```
        # from anywhere in the system we can give image t
        filepath = os.path.join(basepath, 'uploads', f.filename)
        #print("upload folder is", filepath)
        f.save(filepath)

        img = image.load_img(filepath, target_size=(244, 244))
        x = image.img_to_array(img)  # img to array
        x = np.expand_dims(x, axis=0)  # used for adding one more dimension
        # print(x)
        img_data = preprocess_input(x)
        prediction1 = np.argmax(model2.predict(img_data))
        prediction2 = np.argmax(model1.predict(img_data))
        # prediction=model.predict(x)#instead of predict_classes(x) we can use predict(X) ----
>predict_classes #print("prediction is ",prediction)
        index1 = ['front', 'rear', 'side']
        index2 = ['minor', 'moderate', 'severe']
        #result = str(index[output[0]])
        result1 = index1[prediction1]
        result2 = index2[prediction2]

        if (result1 == "front" and result2 == "minor"):
            value = "3000 - 5000 INR"
        elif (result1 == "front" and result2 == "moderate"):
            value = "6000 - 8000 INR"
        elif (result1 == "front" and result2 == "severe"):
            value = "9000 - 11000 INR"
        elif (result1 == "rear" and result2 == "minor"):
            value = "4800 - 6000 INR"
        elif (result1 == "rear" and result2 == "moderate"):
            value = "7080 - 9000 INR"
        elif (result1 == "rear" and result2 == "severe"):
            value = "11000 - 13000 INR"
        elif (result1 == "side" and result2 == "minor"):
            value = "6000 - 8000 INR"
        elif (result1 == "side" and result2 == "moderate"):
            value = "9000 - 11000 INR"
        elif (result1 == "side" and result2 == "severe"):
            value = "12000 - 15000 INR"
        else:
            value = "16000 - 50000 INR"
```

```
        return render_template('prediction.html', prediction=value)
""" Running our application """
if __name__ == "__main__":
    app.run(debug=False, port=8080)
```

13.2 GITHUB & PROJECT DEMO LINK

https://github.com/IBM-EPBL/IBM-Project-38495-1660381569

DEMO LINK

CHAPTER-14
REFERENCES

1.Qianqian, Zhu, et al. "Research on intelligent vehicle damage assessment system based on computer vision." *Journal of Physics: Conference Series*. Vol. 1518. No. 1. IOP Publishing, 2020.

2.Tan, Hong, et al. "Automatic emergency braking (AEB) system impact on fatality and injury reduction in China." *International journal of environmental research and public health* 17.3 (2020): 917.

3.Zhang, Wei, et al. "Automatic Car Damage Assessment System: Reading and Understanding Videos as Professional Insurance Inspectors." *Proceedings of the AAAI Conference on Artificial Intelligence*. Vol. 34. No. 09. 2020.

4.Kyu, Phyu Mar, and Kuntpong Woraratpanya. "Car damage detection and classification." *Proceedings of the 11th international conference on advances in information technology*. 2020.

5.Zhu, Xianglei, et al. "A unified framework of intelligent vehicle damage assessment based on computer vision technology." *2019 IEEE 2nd International Conference on Automation, Electronics and Electrical Engineering (AUTEEE)*. IEEE, 2019.

6.Dhieb, Najmeddine, et al. "A very deep transfer learning model for vehicle damage detection and localization." *2019 31st International Conference on Microelectronics (ICM)*. IEEE, 2019.

7.Patil, Kalpesh, et al. "Deep learning based car damage classification." *2017 16th IEEE international conference on machine learning and applications (ICMLA)*. IEEE, 2017.