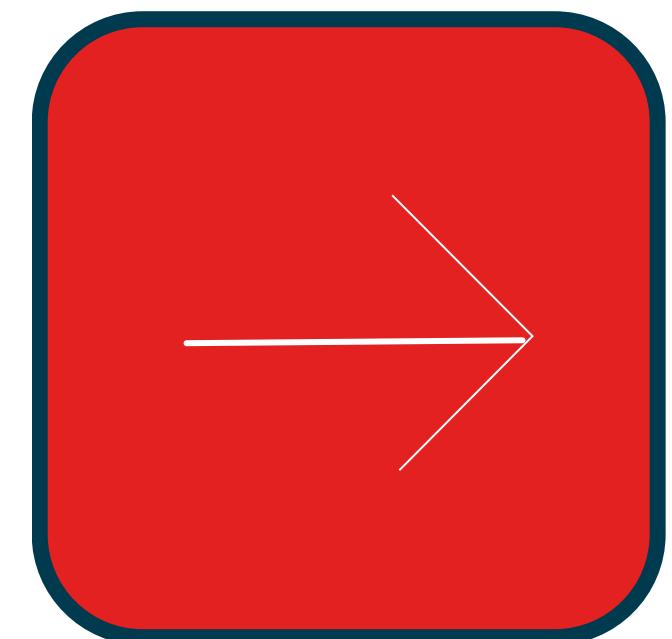
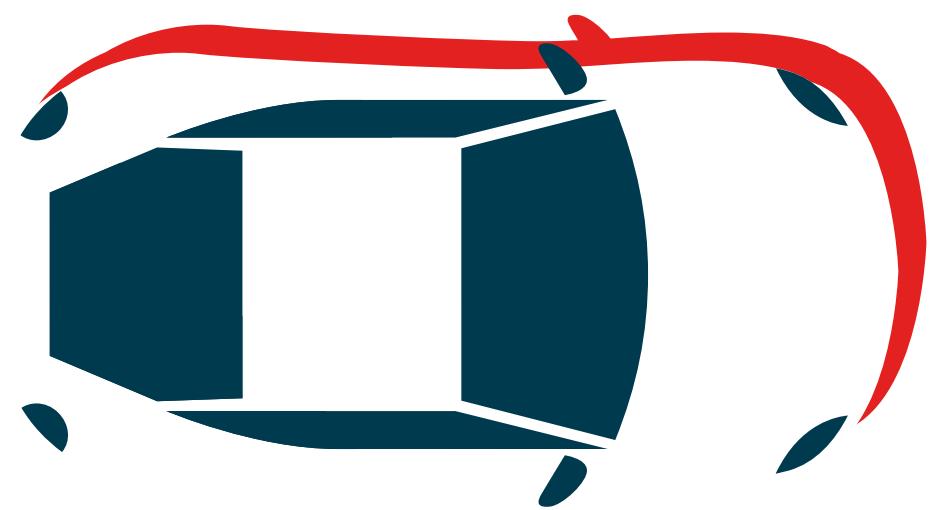
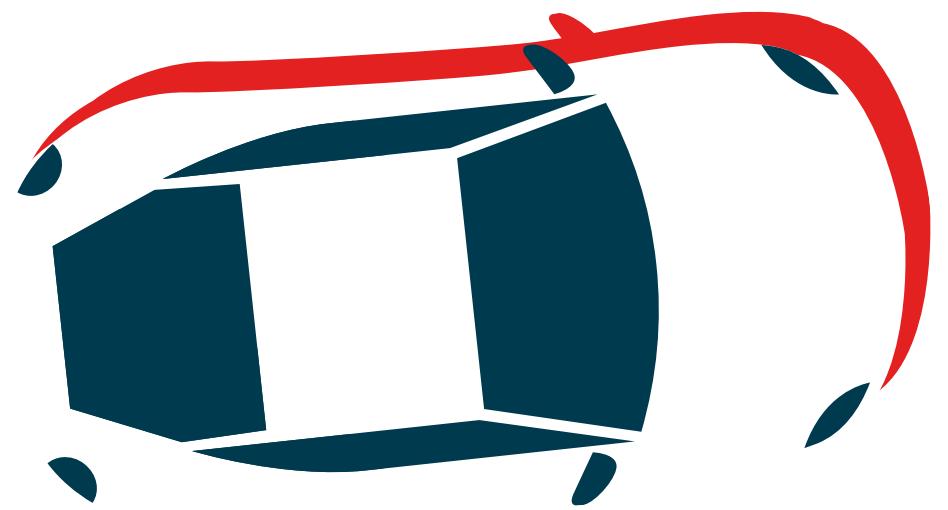


AINSURANCE

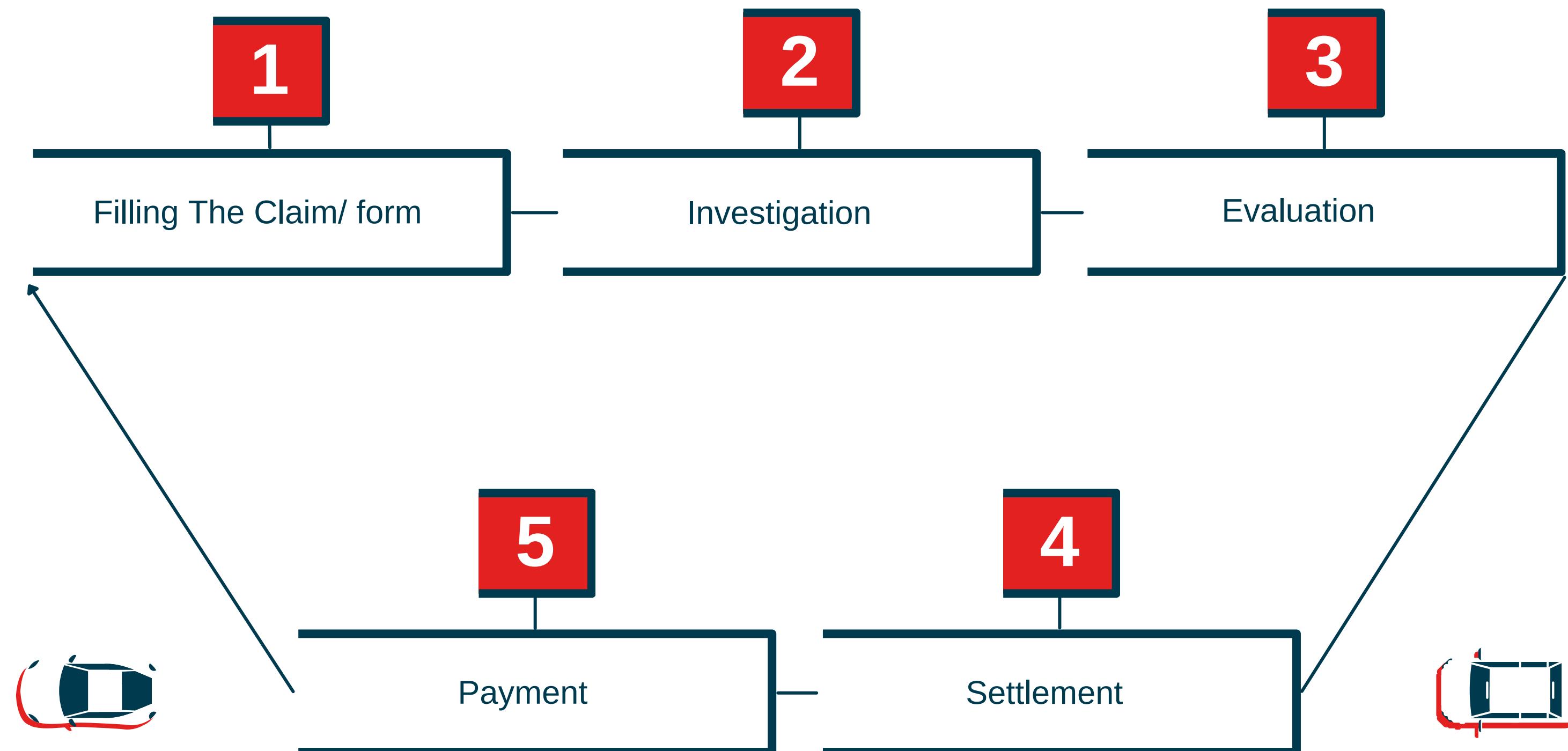
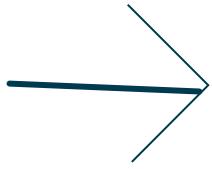
RAYANE BOUMEDIENE MAZARI
DIEGO SANMARTÍN CARRIÓN
ZANE KENDALL REDA
PABLO ORTEGA GAYO
YAHYA LARAQUI HOUSSAINI
YOUSSEF WALID AHMED



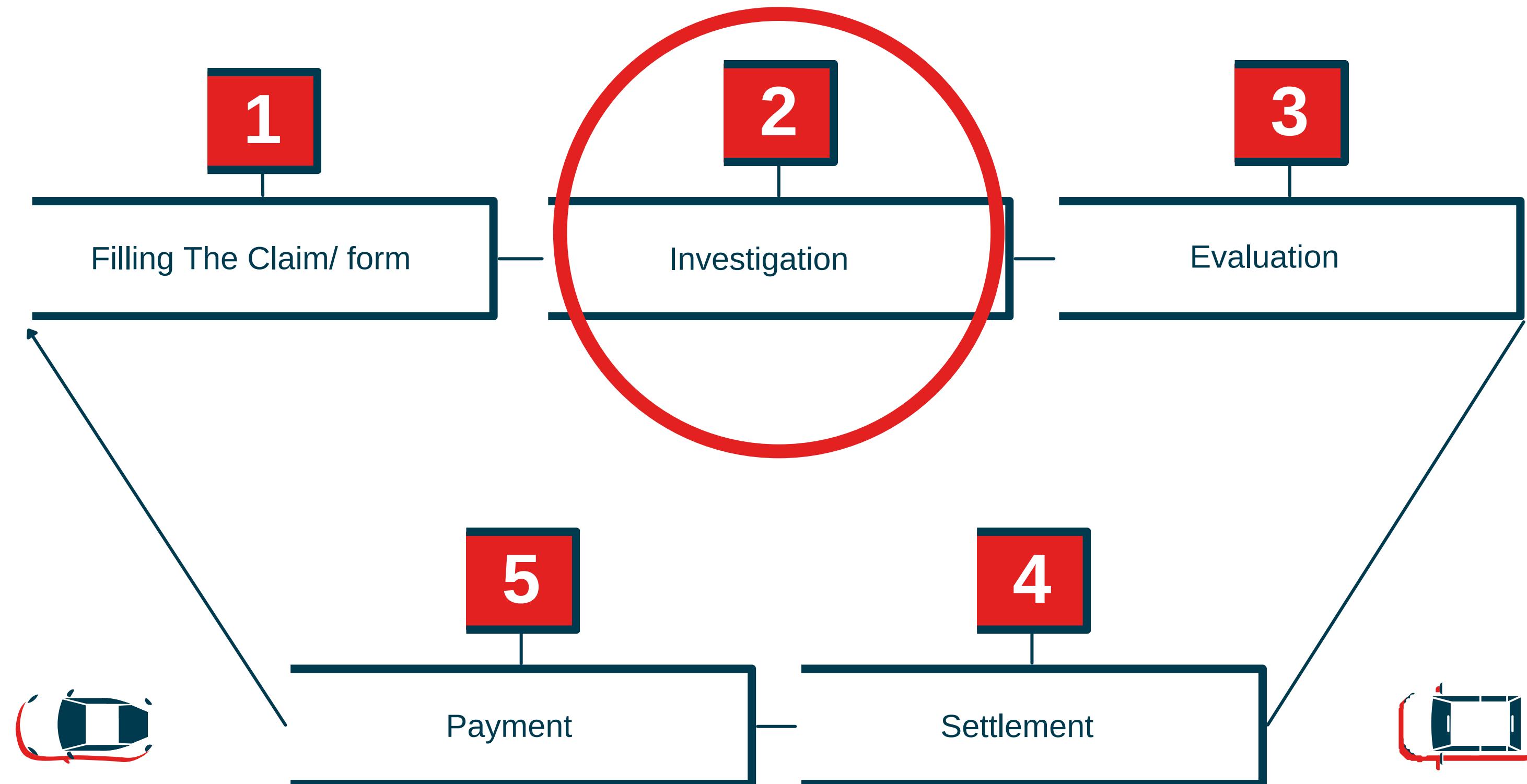
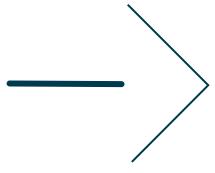


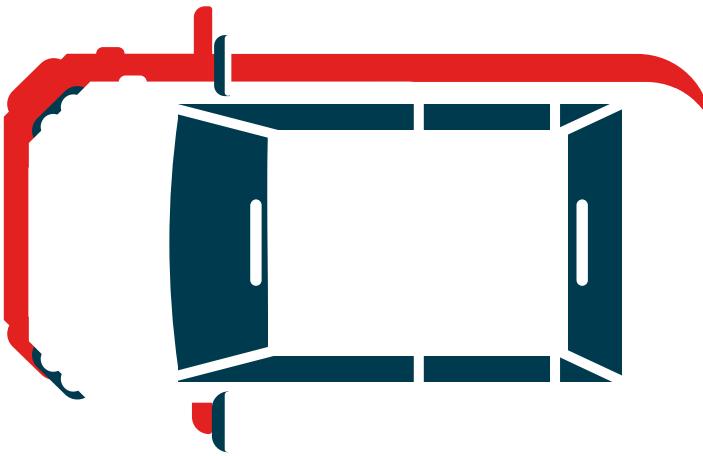
INTRODUCTION

INCIDENCE REPORT PIPELINE

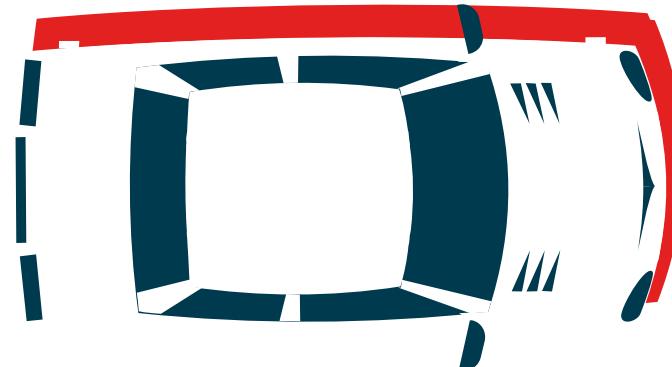


INCIDENCE REPORT PIPELINE

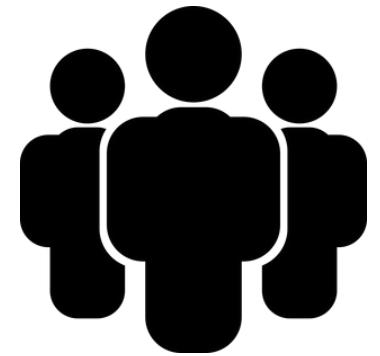




INVESTIGATION



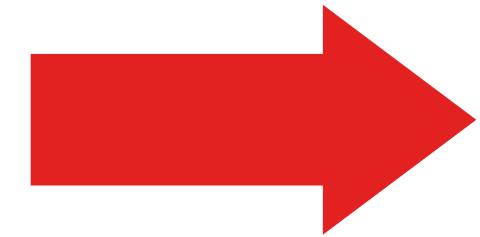
ACTUAL SITUATION



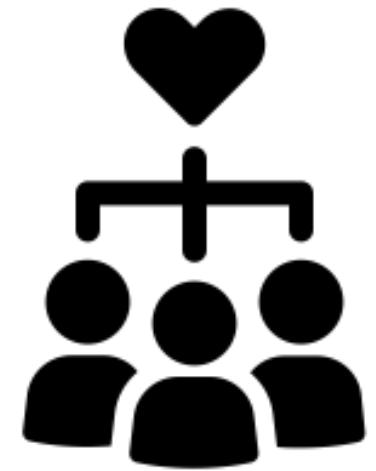
Big Team



Spend Time



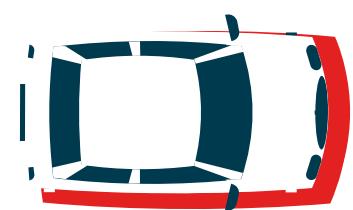
Inefficiency



Low Fidelity Rate



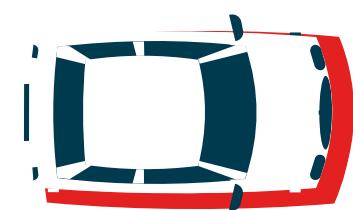
Cost overruns



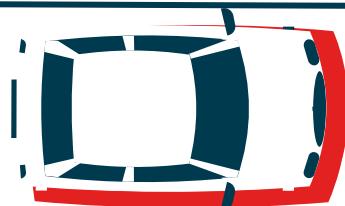
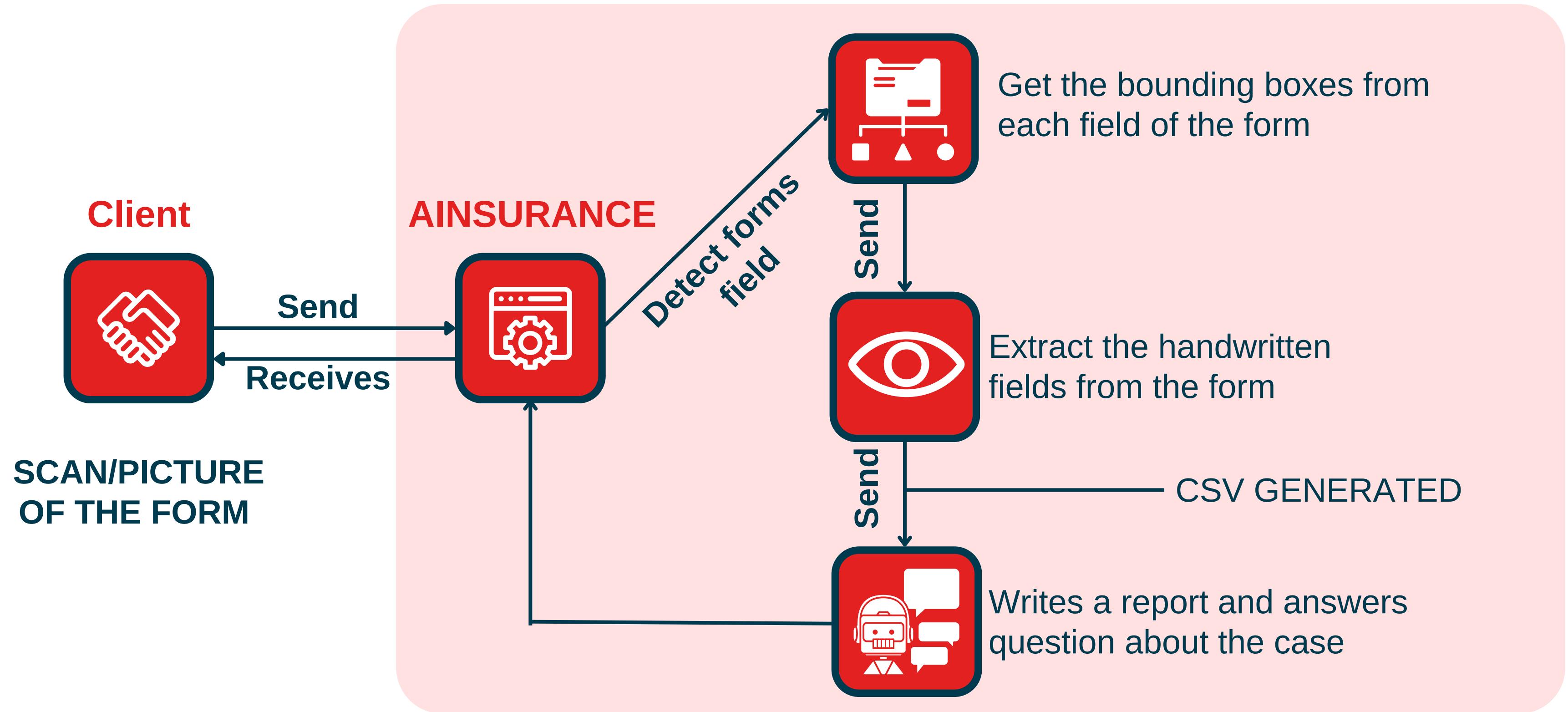
STRATEGY PERSPECTIVES



SOLUTION = Alnsurance



MODEL IN ACTION



DECLARACIÓN AMISTOSA DE ACCIDENTE

1 Fecha del Accidente: 11/9/2009 Hora: 12:00 Lugar: País: 3 Victima(s) incluso leves: no si

4 Daños materiales: Vehículos distintos de A y B y/o objetos distintos al vehículo: no si

5 Testigos: nombre, dirección, tel.: Tel. o E-mail: 6452948808

Vehículo A

6 Asegurado (vive poliza de seguro): NOMBRE: Alfonso Apellidos: DIRECCIÓN: Calle de la Constitución, 76 Código Postal: 37002 País: España Tel. o E-mail: 6452948808

7 Vehículo

VEHÍCULO A MOTOR: Marca, modelo: Matri. o bastidor: Matrícula (o bastidor): País de matrícula: REMOLQUE: Matri. o bastidor: Matrícula (o bastidor): País de matrícula:

Vehículo B

12. CIRCUNSTANCIAS

6 Asegurado (vive poliza de seguro): NOMBRE: Juan Apellidos: DIRECCIÓN: Calle de la Constitución, 12 Código Postal: 37002 País: España Tel. o E-mail: 6452948808

7 Vehículo

VEHÍCULO A MOTOR: Marca, modelo: Matri. o bastidor: Matrícula (o bastidor): País de matrícula: REMOLQUE: Matri. o bastidor: Matrícula (o bastidor): País de matrícula:

12. CIRCUNSTANCIAS

1 Poner un aspa (x) en cada casilla A que proceda para precisar el cruce B
"tachar las circunstancias en orden"
1. Iba a estacionar 2. Salía de un aparcamiento/abriendo puerta 3. Iba a estacionar 4. Salía de un aparcamiento, de un lugar privado, de un camino de tierra 5. Entrada a un aparcamiento, a un lugar privado, a un camino de tierra 6. Entrada a una plaza de sentido giratorio 7. Circulaba por una plaza de sentido giratorio 8. Colisión en la parte de atrás al otro vehículo que circulaba en el mismo sentido y en el mismo carril 9. Circulaba en el mismo sentido y en el contrario 10. Cambiaba de carril 11. Adelantaba 12. Giraba a la derecha 13. Giraba a la izquierda 14. Daba marcha atrás 15. Invadía la parte reservada a la circulación en sentido inverso 16. Venía de la derecha 17. No respetó la señal de preferencia o semáforo en rojo

Form's fields detection model

DECLARACIÓN AMISTOSA DE ACCIDENTE

1 Fecha del Accidente: 2/7/2012 Hora: 17:28 Lugar: País: 3 Victima(s) incluso leves: no si

4 Daños materiales: Vehículos distintos de A y B y/o objetos distintos al vehículo: no si

5 Testigos: nombre, dirección, tel.: Tel. o E-mail: 6540063402

Vehículo A

6 Asegurado (vive poliza de seguro): NOMBRE: Alfonso Apellidos: DIRECCIÓN: Calle de la Constitución, 76 Código Postal: 37002 País: España Tel. o E-mail: 6452948808

7 Vehículo

VEHÍCULO A MOTOR: Marca, modelo: Matri. o bastidor: Matrícula (o bastidor): País de matrícula: REMOLQUE: Matri. o bastidor: Matrícula (o bastidor): País de matrícula:

Vehículo B

12. CIRCUNSTANCIAS

6 Asegurado (vive poliza de seguro): NOMBRE: Juan Apellidos: DIRECCIÓN: Calle de la Constitución, 12 Código Postal: 37002 País: España Tel. o E-mail: 6452948808

7 Vehículo

VEHÍCULO A MOTOR: Marca, modelo: Matri. o bastidor: Matrícula (o bastidor): País de matrícula: REMOLQUE: Matri. o bastidor: Matrícula (o bastidor): País de matrícula:

12. CIRCUNSTANCIAS

1 Poner un aspa (x) en cada casilla A que proceda para precisar el cruce B
"tachar las circunstancias en orden"
1. Estaba estacionado/parado 2. Salía de un estacionamiento/abriendo puerta 3. Iba a estacionar 4. Salía de un aparcamiento, de un lugar privado, de un camino de tierra 5. Entrada a un aparcamiento, a un lugar privado, a un camino de tierra 6. Entrada a una plaza de sentido giratorio 7. Circulaba por una plaza de sentido giratorio 8. Colisión en la parte de atrás al otro vehículo que circulaba en el mismo sentido y en el mismo carril 9. Circulaba en el mismo sentido y en el contrario 10. Cambiaba de carril 11. Adelantaba 12. Giraba a la derecha 13. Giraba a la izquierda 14. Daba marcha atrás 15. Invadía la parte reservada a la circulación en sentido inverso 16. Venía de la derecha (en un cruce) 17. No respetó la señal de preferencia o semáforo en rojo



Ainsurrance Report

The investigation of the accident report concluded that the accident was caused by B's negligence, as indicated by the Xs in boxes 1, 3, 9, 10, 16 and 17. B's insurance policy is valid until 8/6, and will cover the damages caused by the accident, as the policy is valid at the time of the incident. A's insurance policy is valid until 12/12 and will not cover the damages caused by the accident, as the policy is not valid at the time of the incident.

LLMfor q/a and report generation

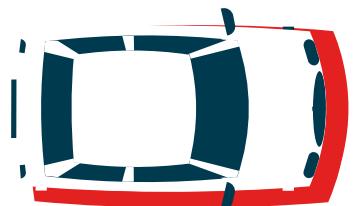
text	type
28/7/2014	Fecha
14:36	HORA

Handwritten text extraction model

x	y	w	h
42	108	136	19
224	106	63	21

Ainsurrance ChatBot Q/A

You:



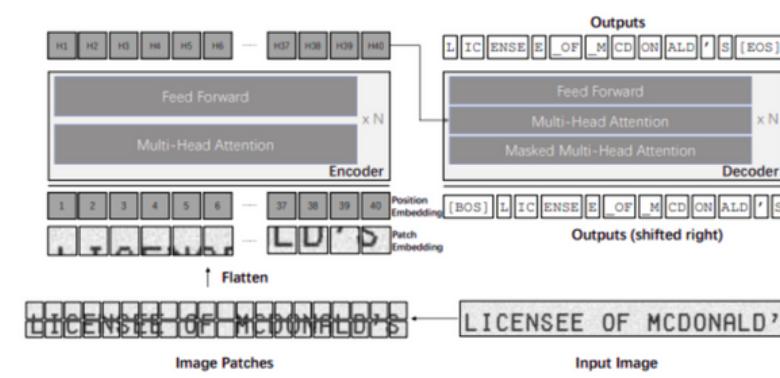
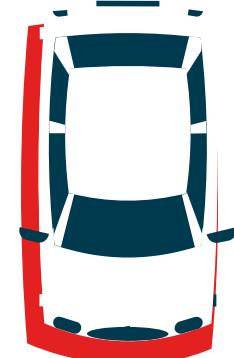
P

AINSURANCE MODELS

YOLOv8

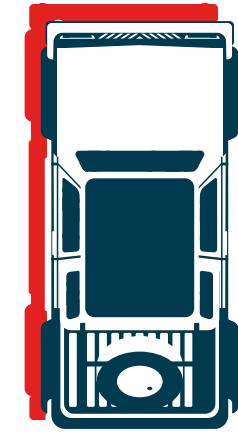
YOLO v8

Form fields
detection and
classification



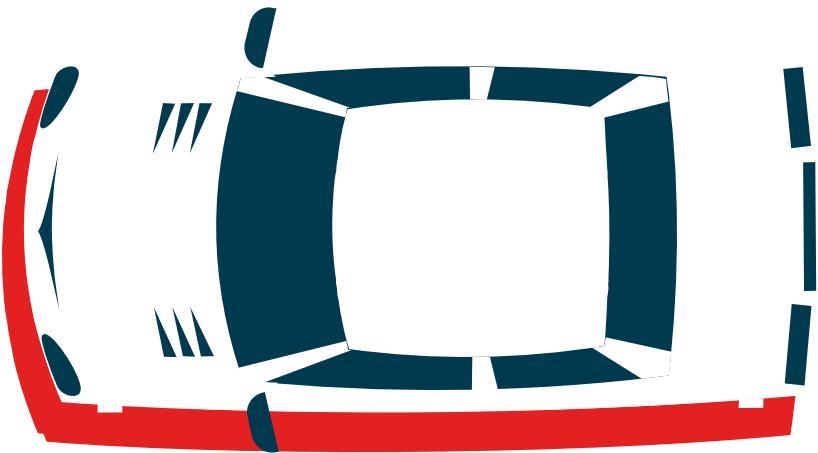
**OCR VISION
TRANSFORMER**

For handwritten
text extraction



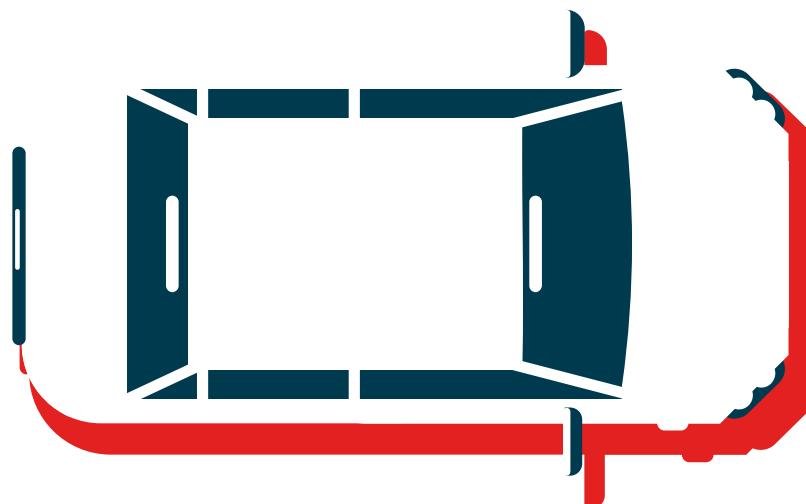
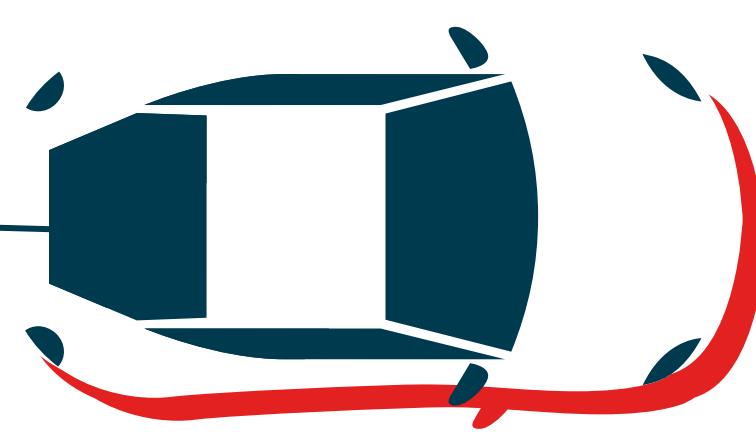
LLM

Report Writing and
question/answering
about the report



MODEL 1

YOLOV8



YOLOV8

PERFORMANCE

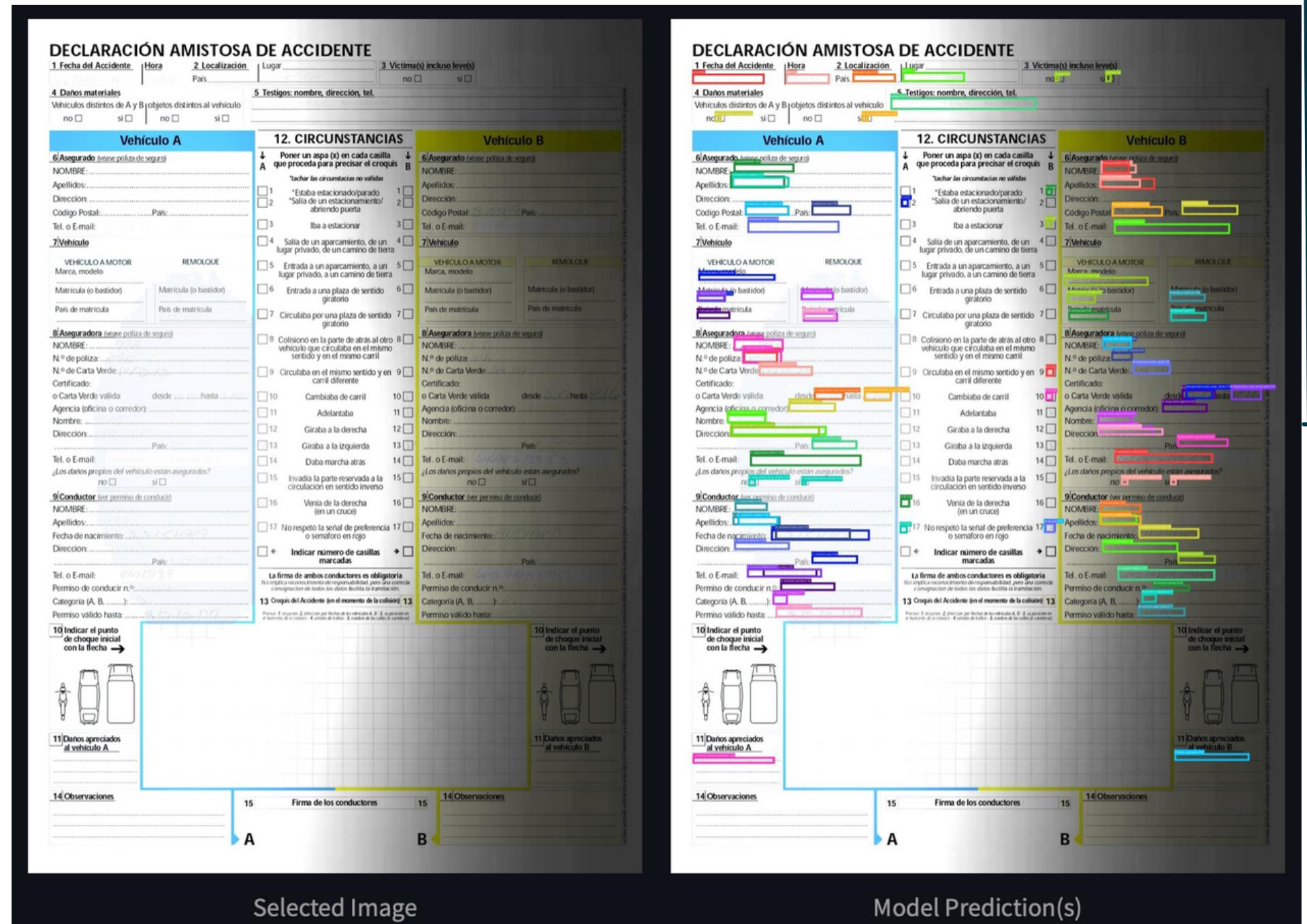
CASE

YOLOv8 is fast , powerful and and easy to train model. It has been used in this case to classify the filling form boxes in the insurance car paper, in order to classify and detect them and finally give those classified field to our OCR model .

TRAINING

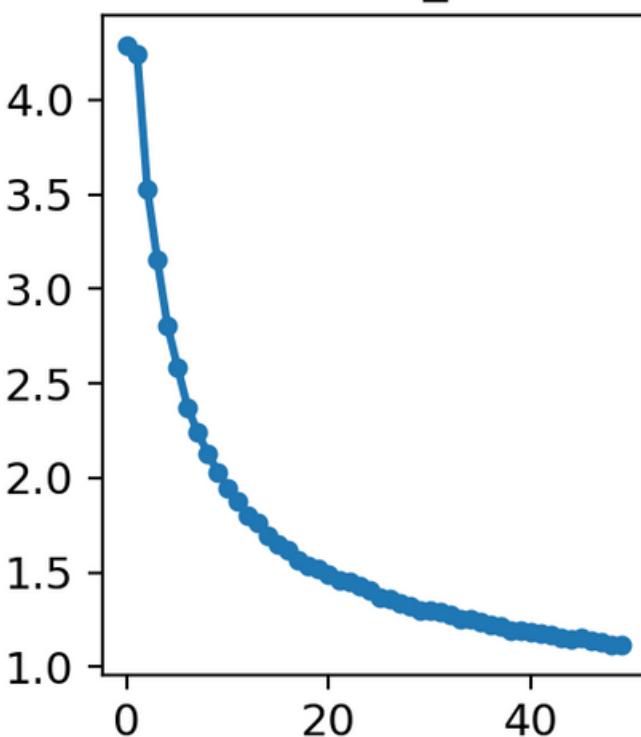
YOLOv8 Training parameters :

- Batch size 14
- epochs 100
- imgsize= 640
- device = gpu
- training time =24h

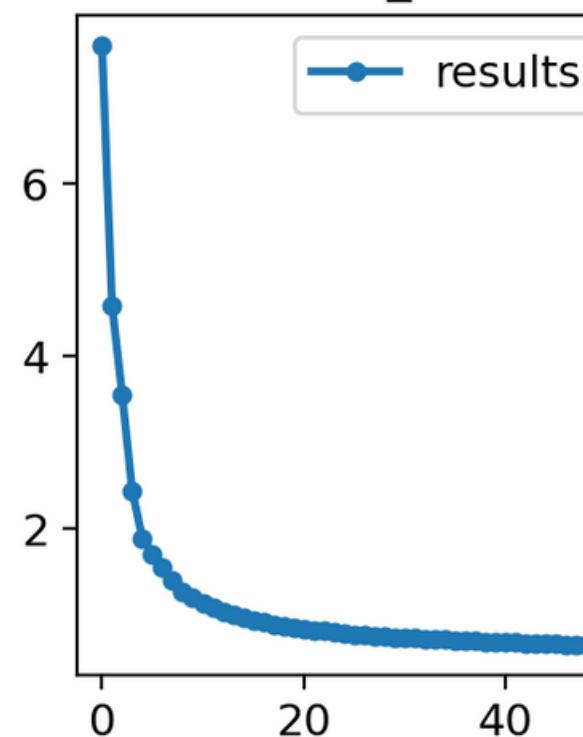


PERFORMANCE

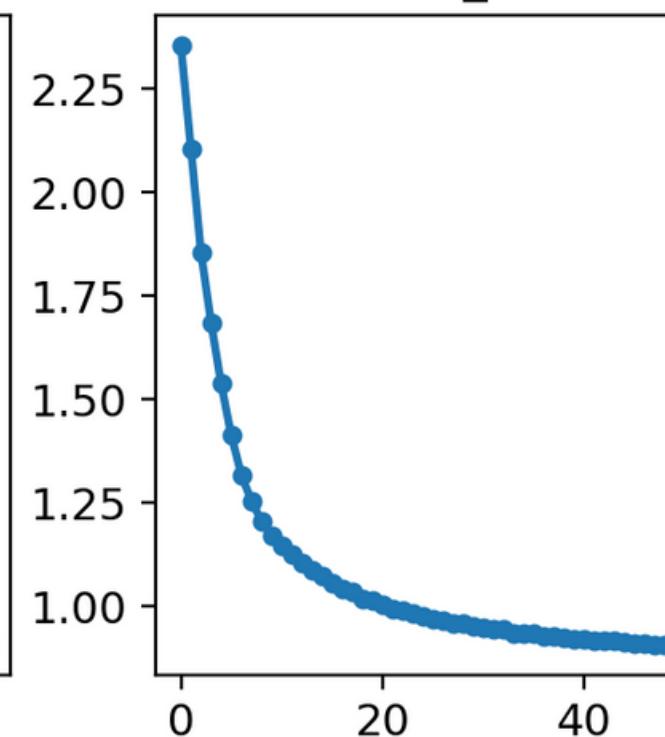
train/box_loss



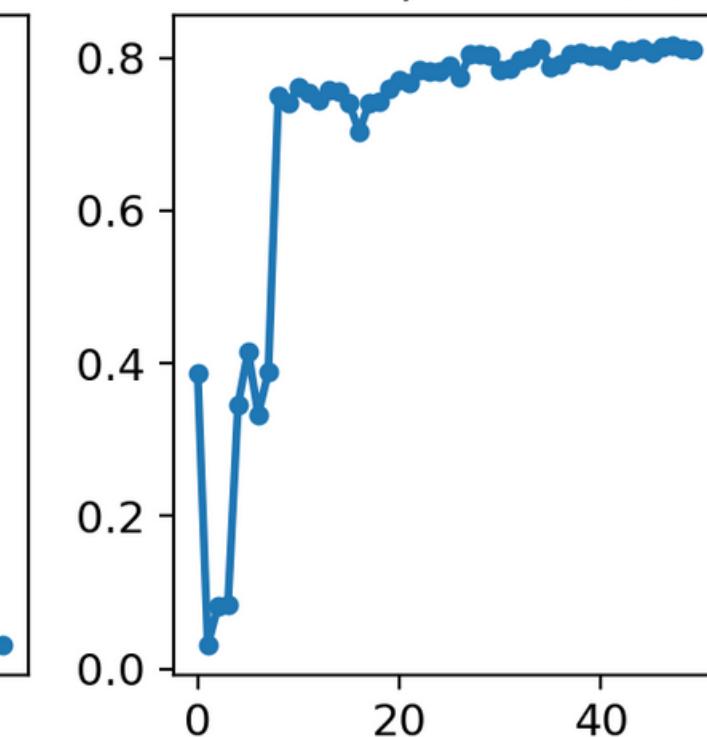
train/cls_loss



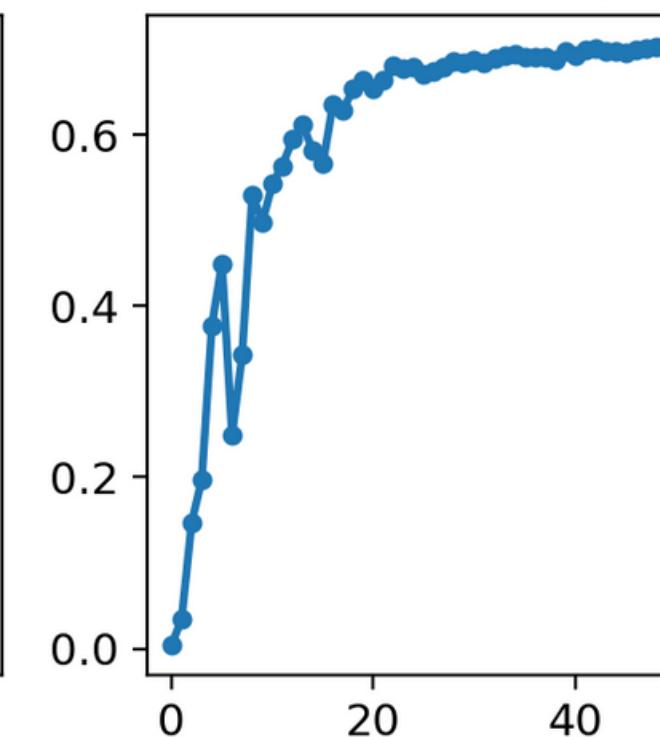
train/dfl_loss



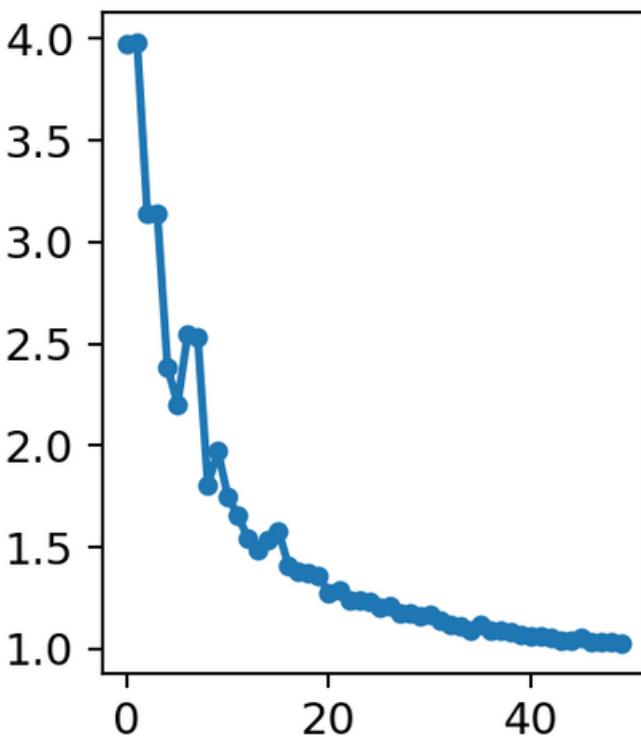
metrics/precision(B)



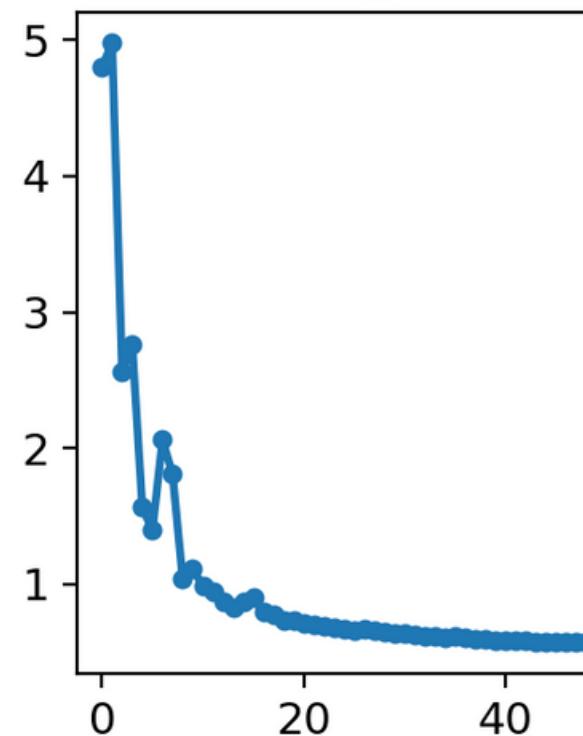
metrics/recall(B)



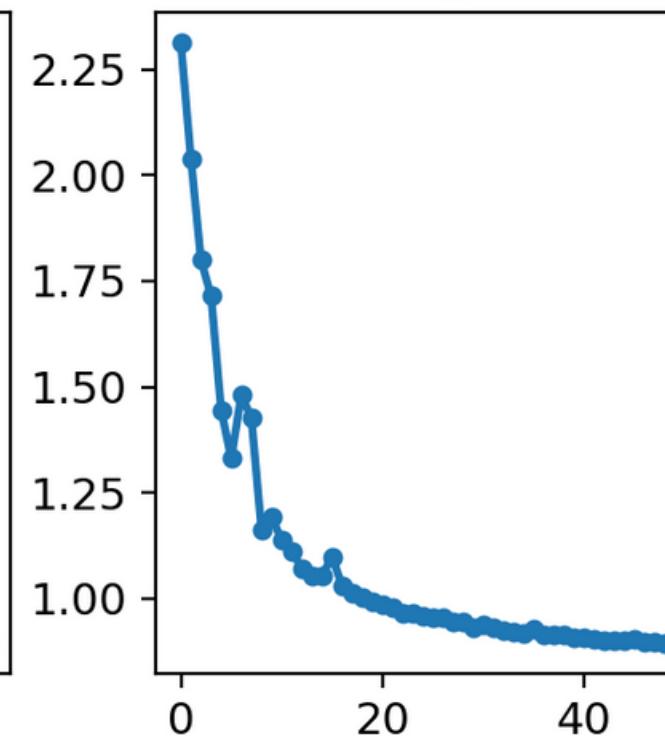
val/box_loss



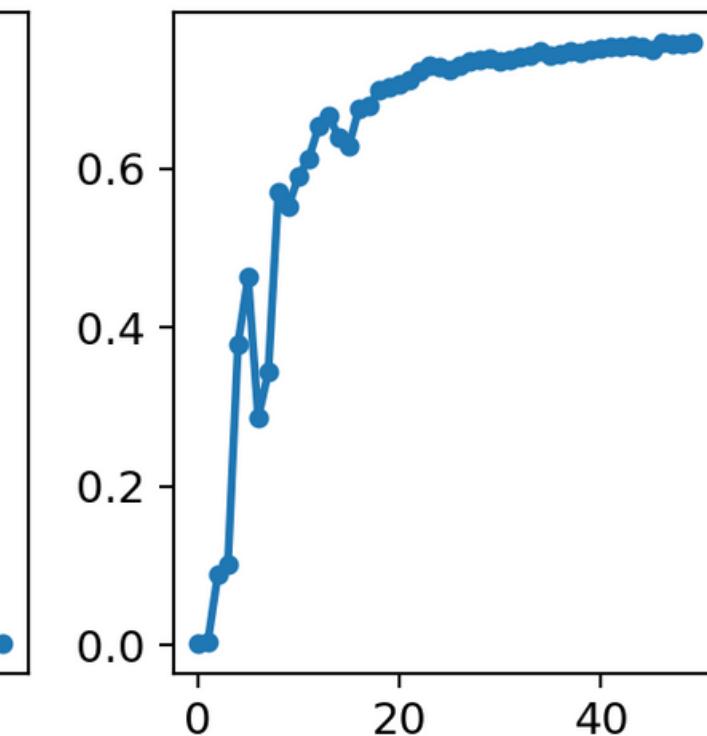
val/cls_loss



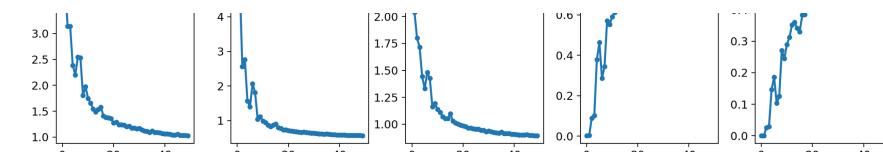
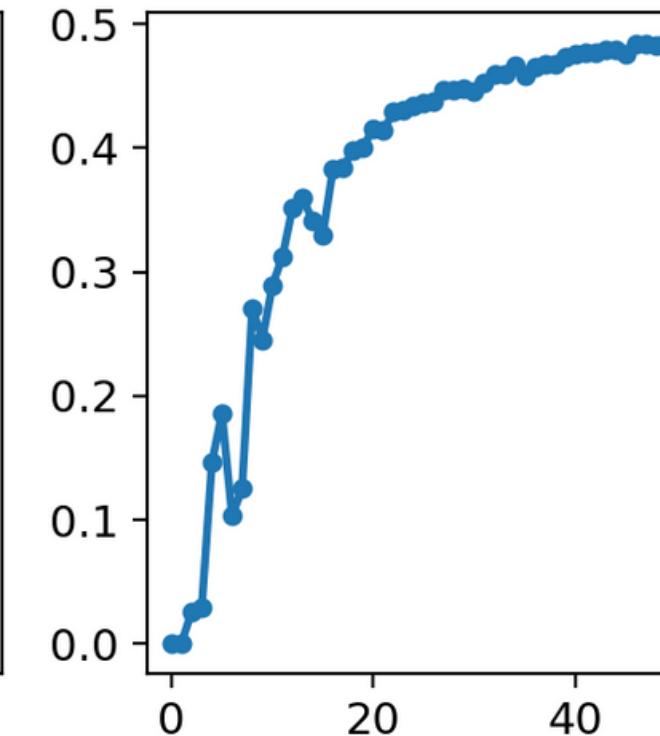
val/dfl_loss



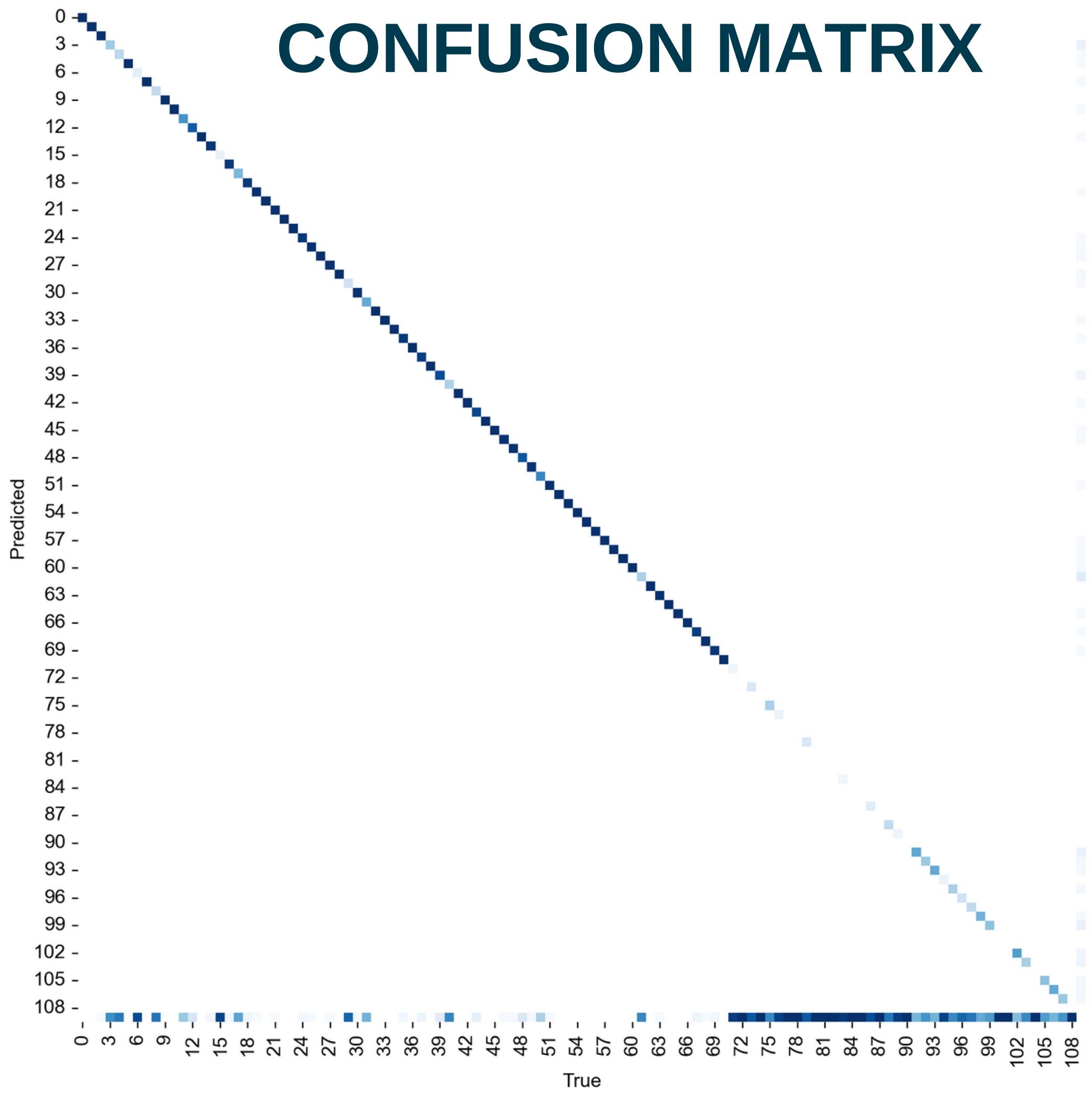
metrics/mAP50(B)

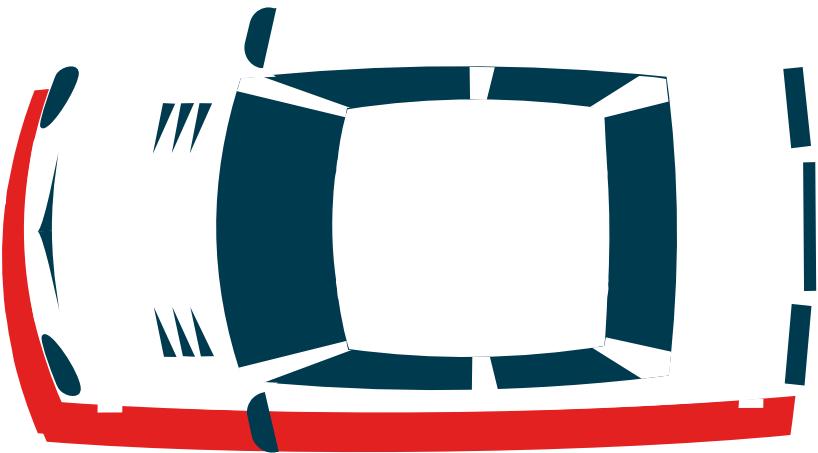


metrics/mAP50-95(B)



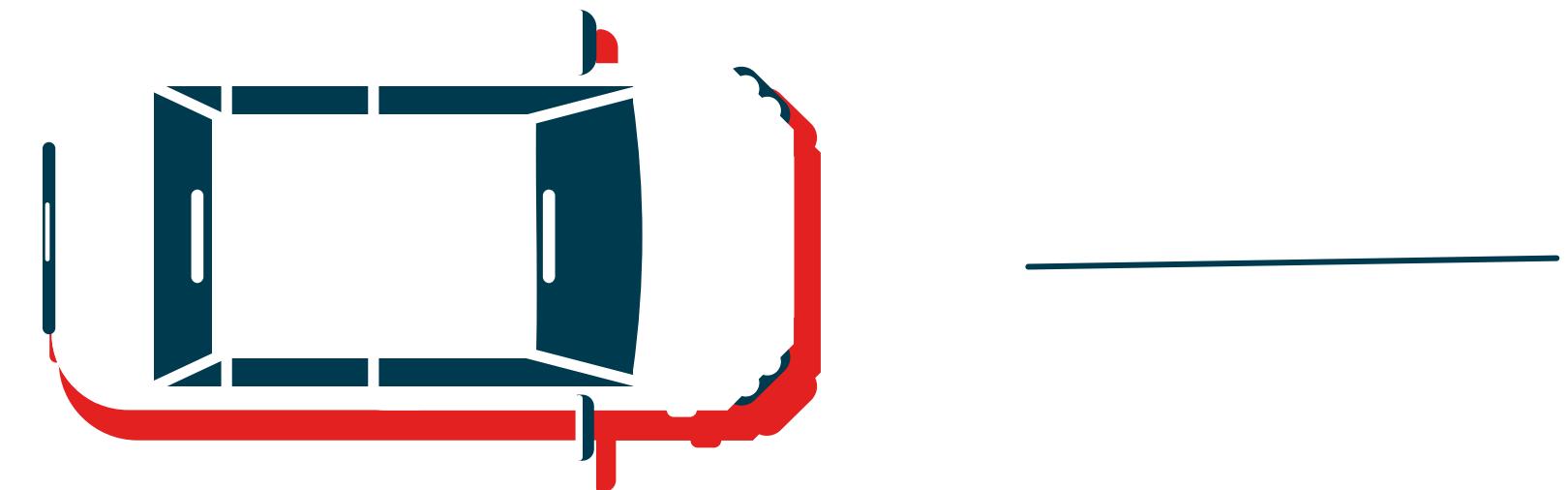
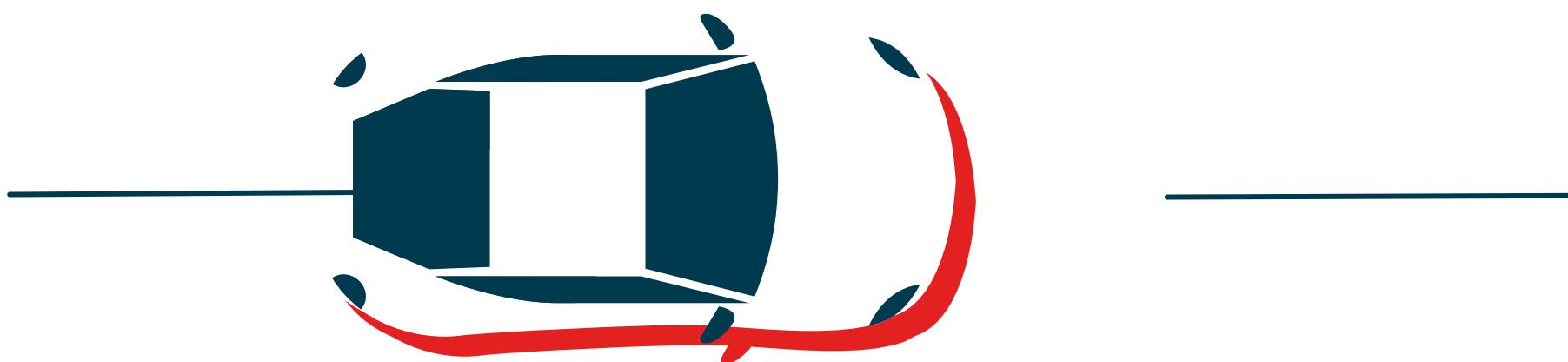
CONFUSION MATRIX





MODEL 2

TROCR



TROCR

- Training over all the features of the dataset
- Seq2Seq trainer
- Two models:

Image processor

`microsoft/trocr-base-handwritten`

VisionEncoderDecoder

`microsoft/trocr-small-stage1`

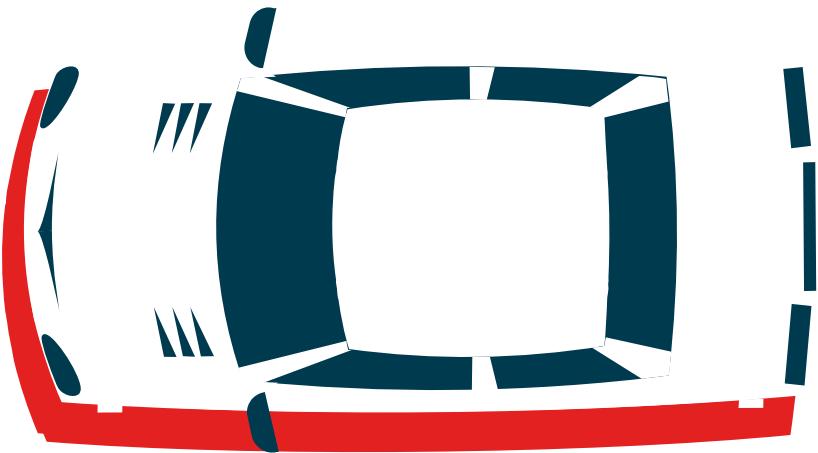
Encode images to
numbers

Decode numbers
to text

PERFORMANCE

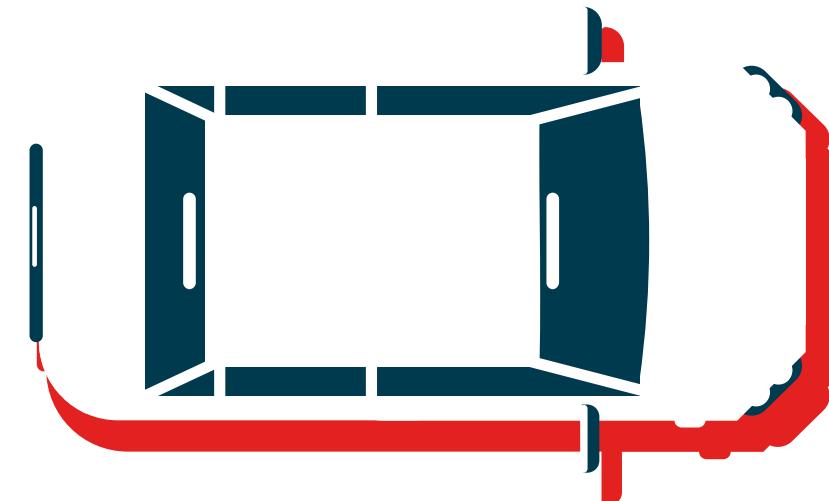
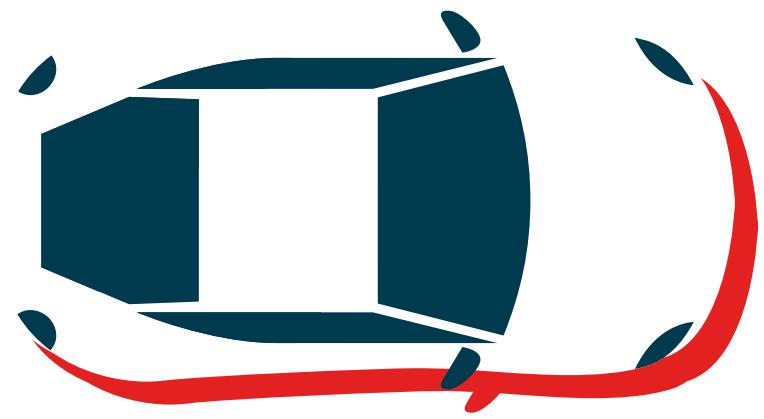
- CER: 0.19
- Can greatly generalize on unseen data





MODEL 3

LLM



LLM

CASE

We decided to use the LLM api key of gpt3 to get more insights about the data captured from the previous models. This LLM allows us to both write a report about the incidence as well as answering questions about the case through a bot interface.

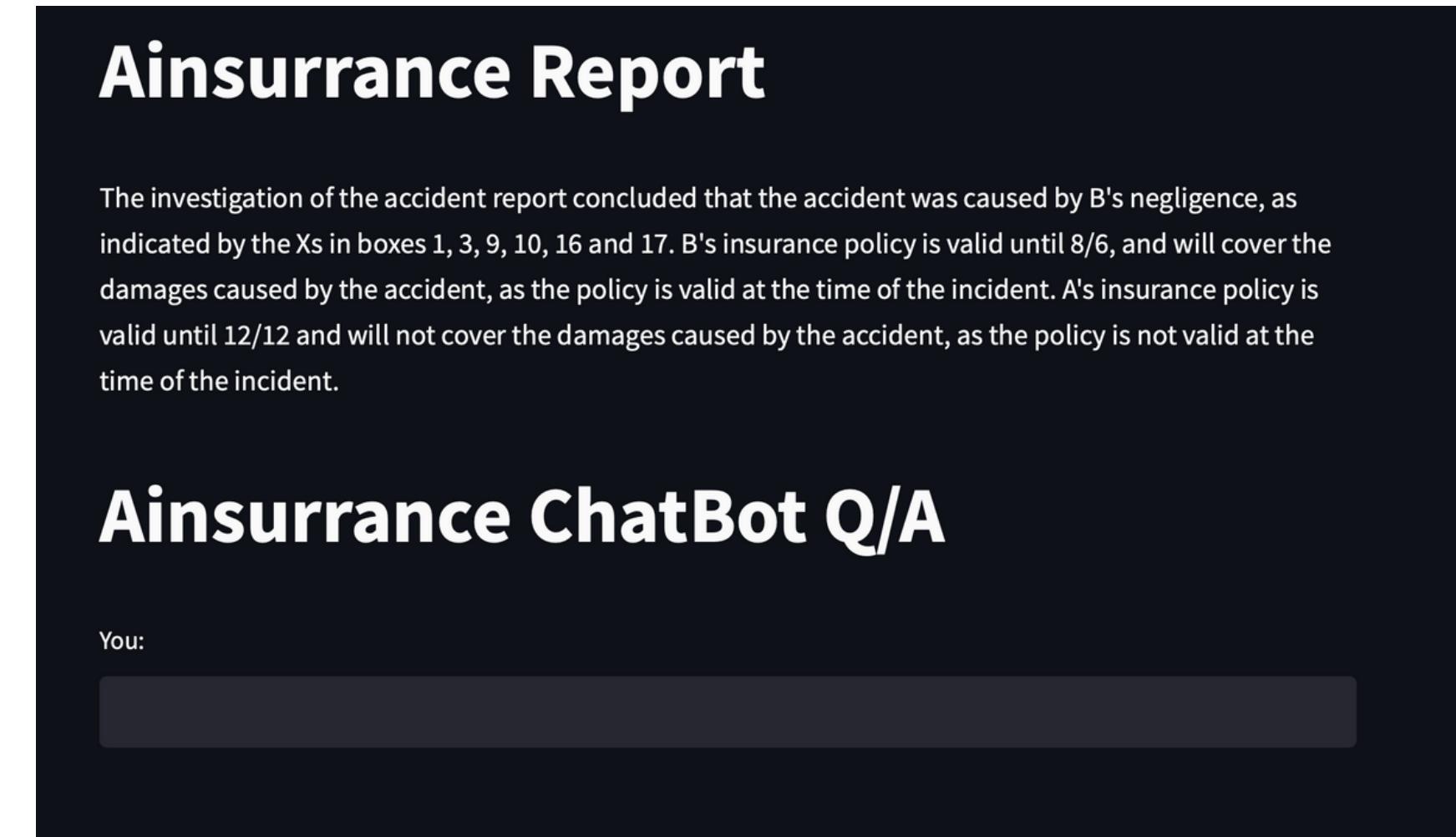
Prompt Engineering

REPORT GENERATION:

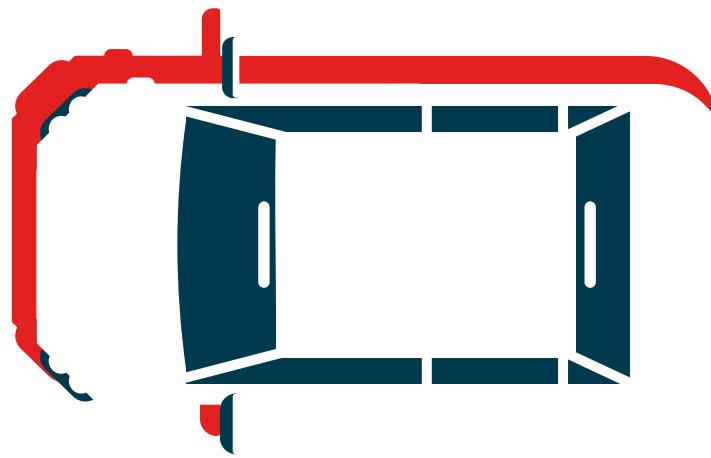
- Prompt = Context about the data and task definition + data frame converted to text => Report

Q&A:

- Prompt = Context about the data + data frame converted to text + user's prompt



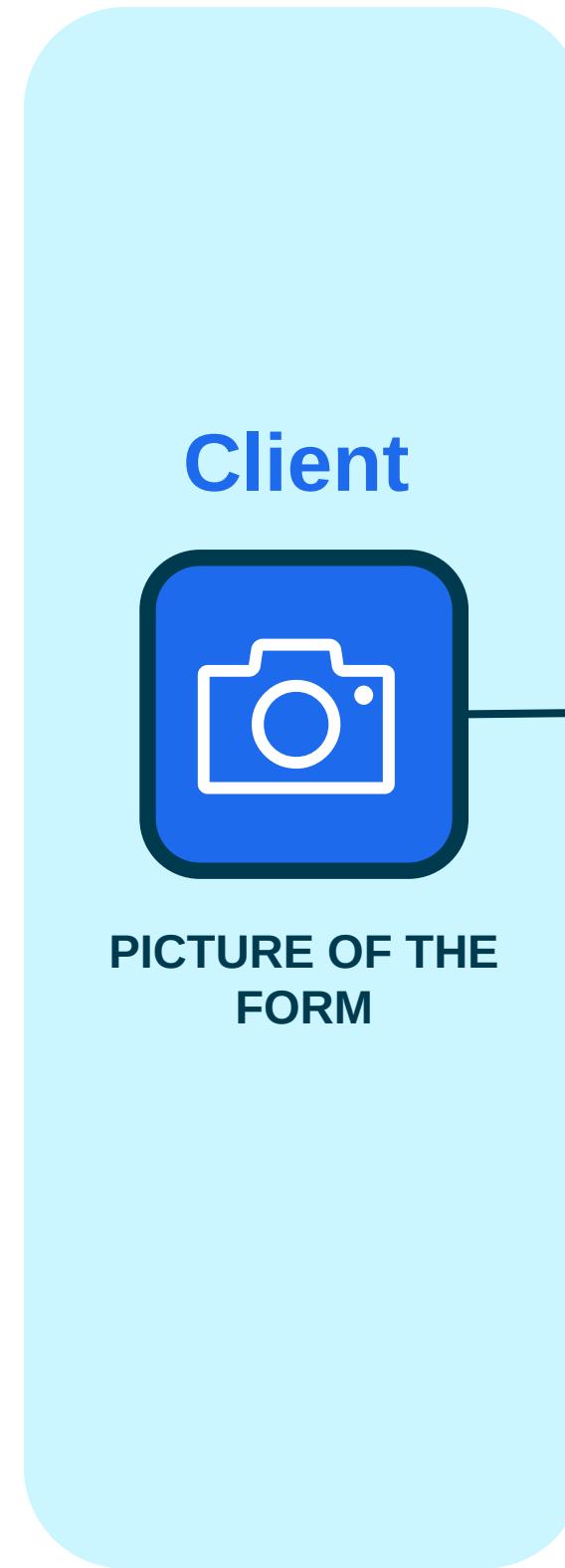
The image shows two dark-themed interfaces. The top interface is titled "Ainsurace Report" in white bold font. Below the title is a paragraph of white text: "The investigation of the accident report concluded that the accident was caused by B's negligence, as indicated by the Xs in boxes 1, 3, 9, 10, 16 and 17. B's insurance policy is valid until 8/6, and will cover the damages caused by the accident, as the policy is valid at the time of the incident. A's insurance policy is valid until 12/12 and will not cover the damages caused by the accident, as the policy is not valid at the time of the incident." The bottom interface is titled "Ainsurace ChatBot Q/A" in white bold font. It has a "You:" label followed by a large, dark gray rectangular input field.



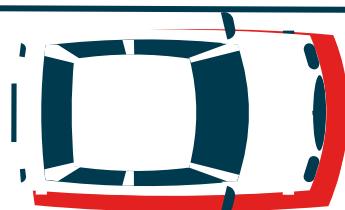
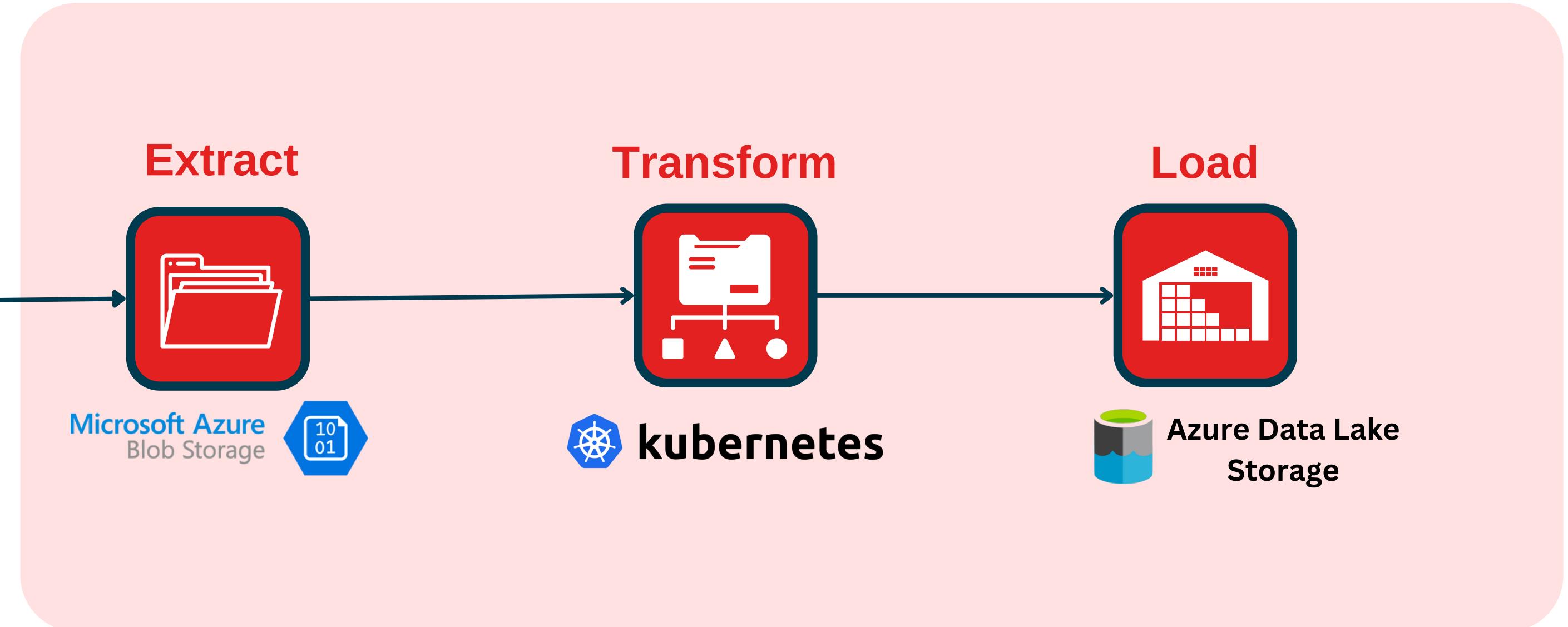
PRODUCTIONIZING AI INSURANCE



UI



ETL



UI

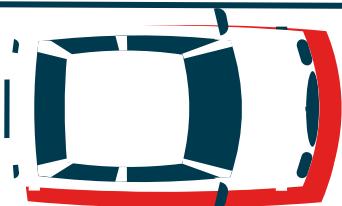
ETL

CORP DATA

Client



PICTURE OF THE FORM



Extract



Microsoft Azure
Blob Storage

10
01

Transform



 kubernetes



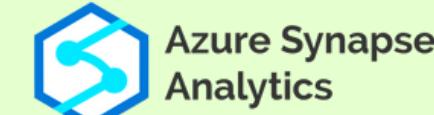
Azure Data Lake
Storage

Accident Report



Azure OpenAI API

Accident Analytics



Azure Synapse
Analytics

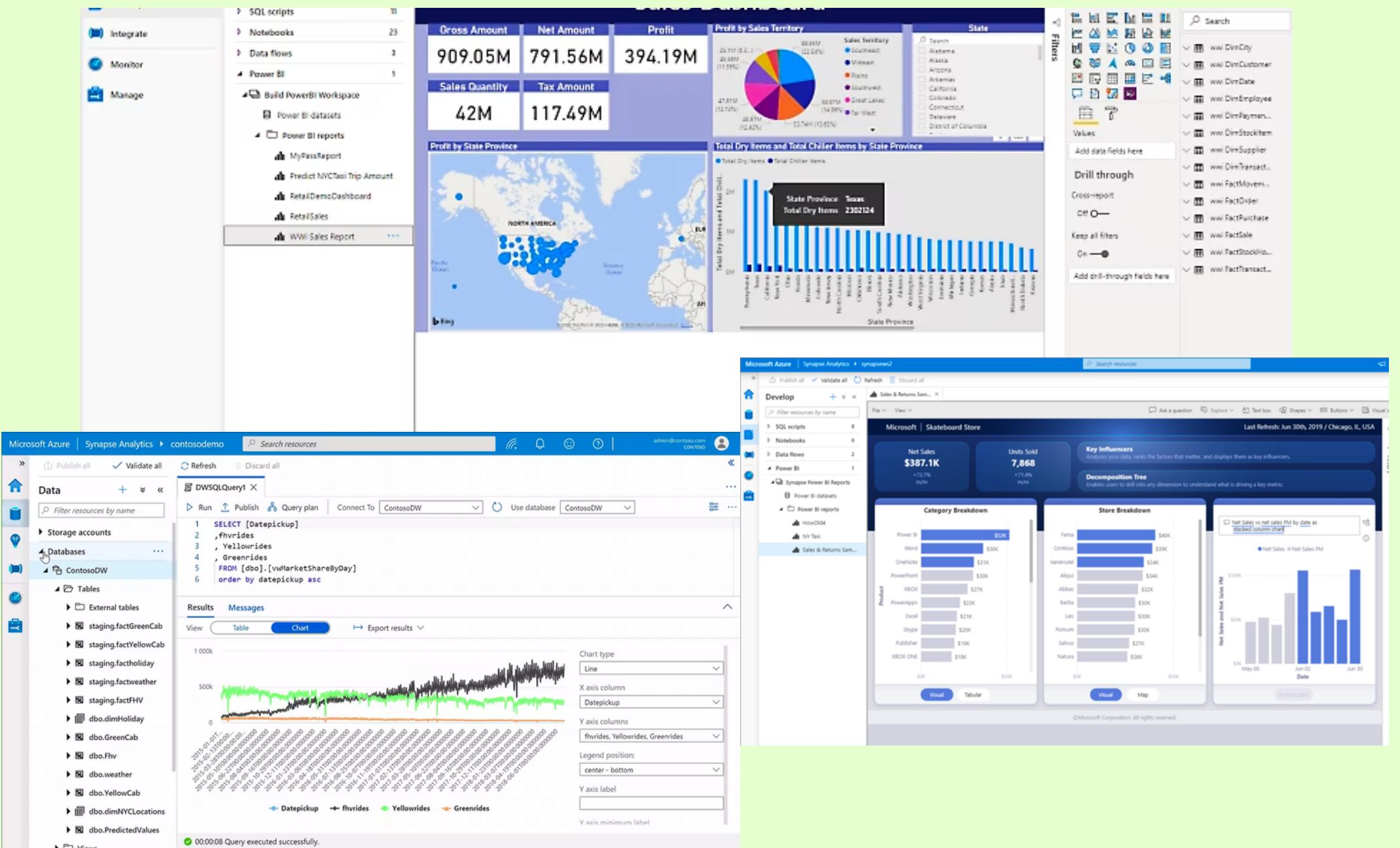
P

CORP DATA

Accident Analytics



Azure Synapse
Analytics

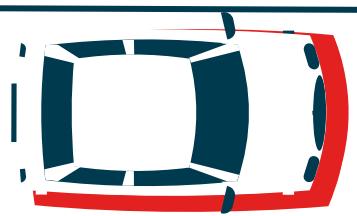
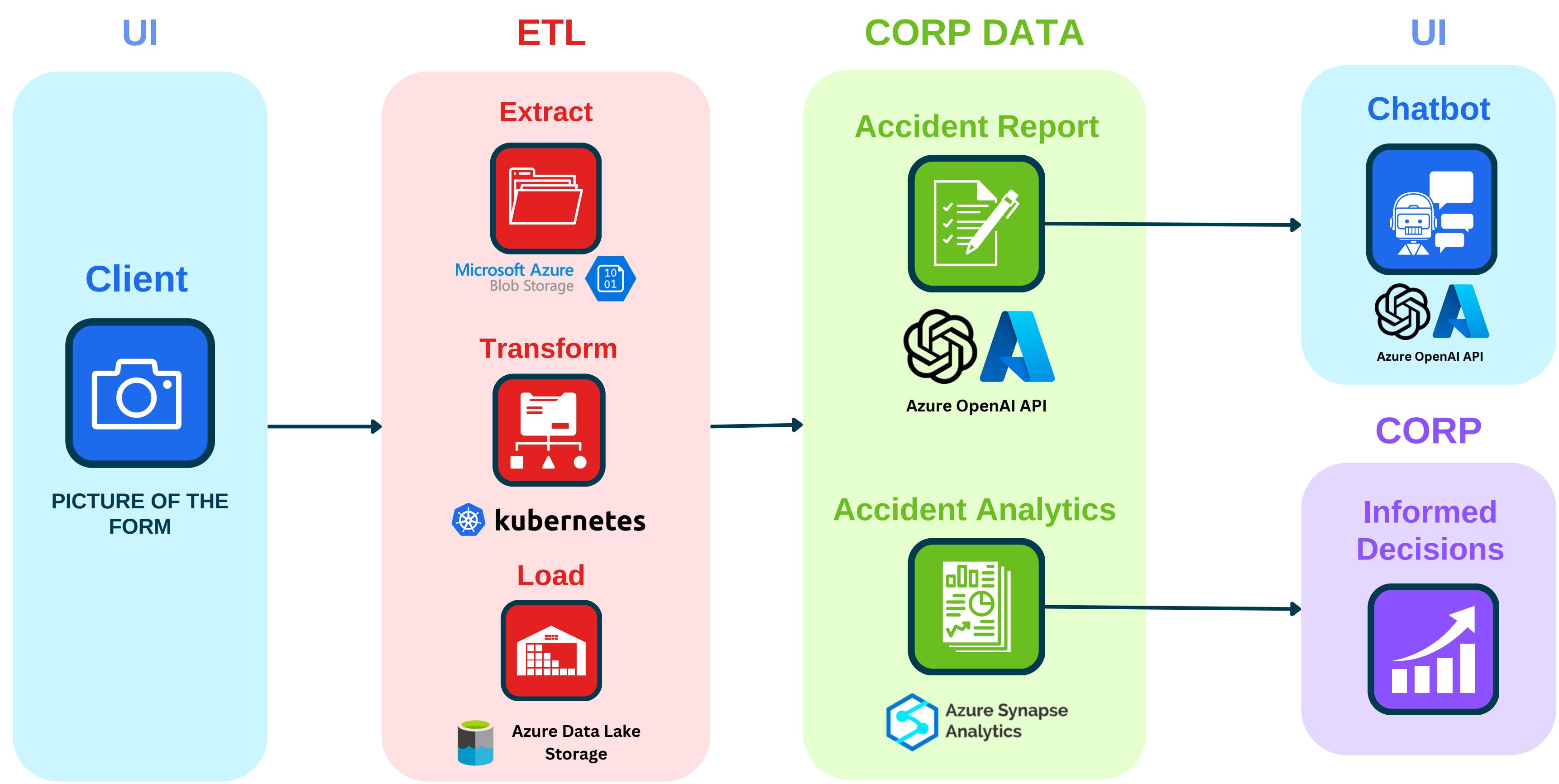


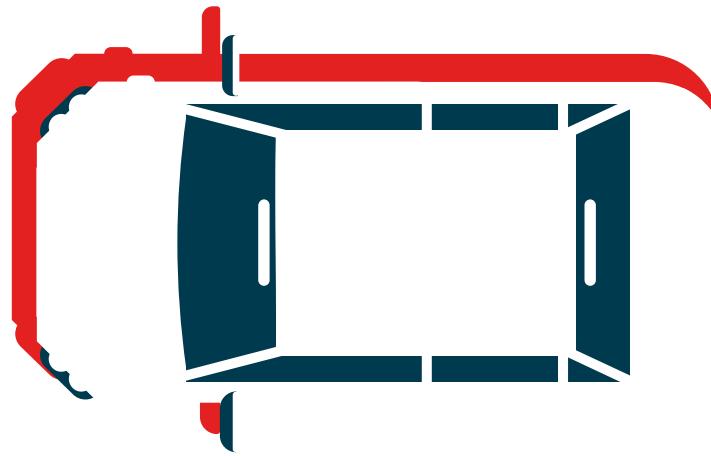
CORP

Informed
Decisions



P



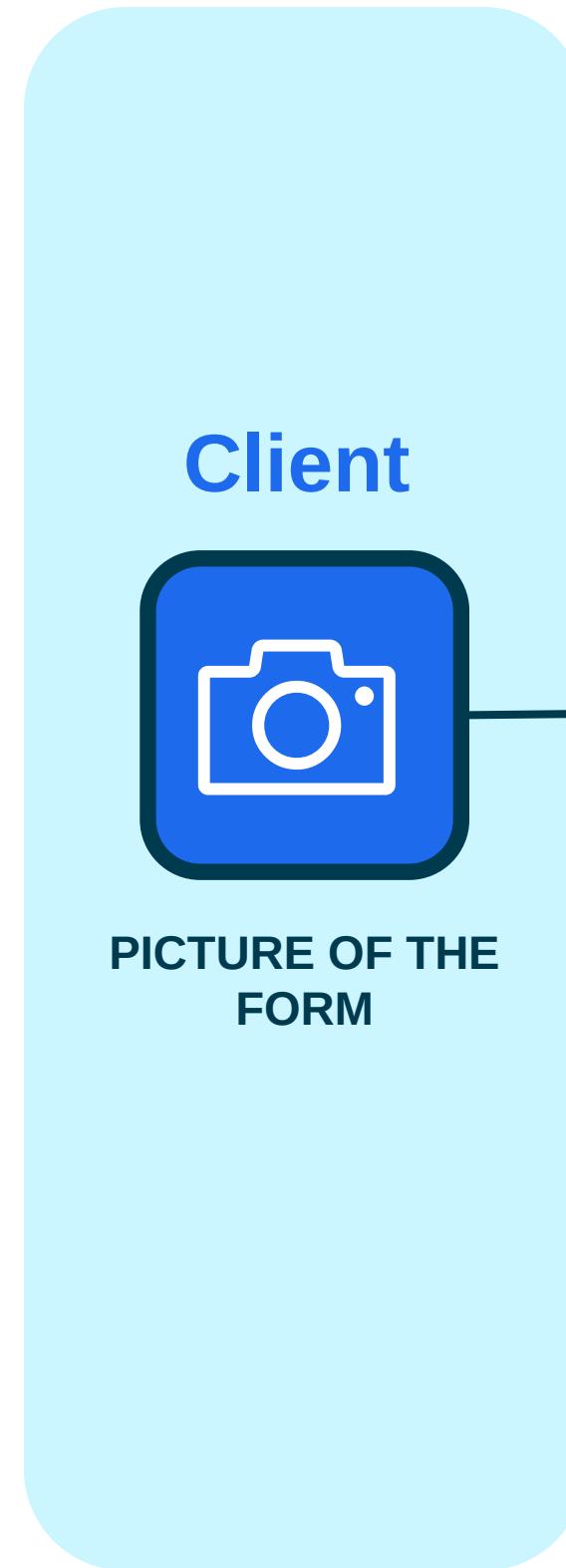


PRODUCTION COSTS

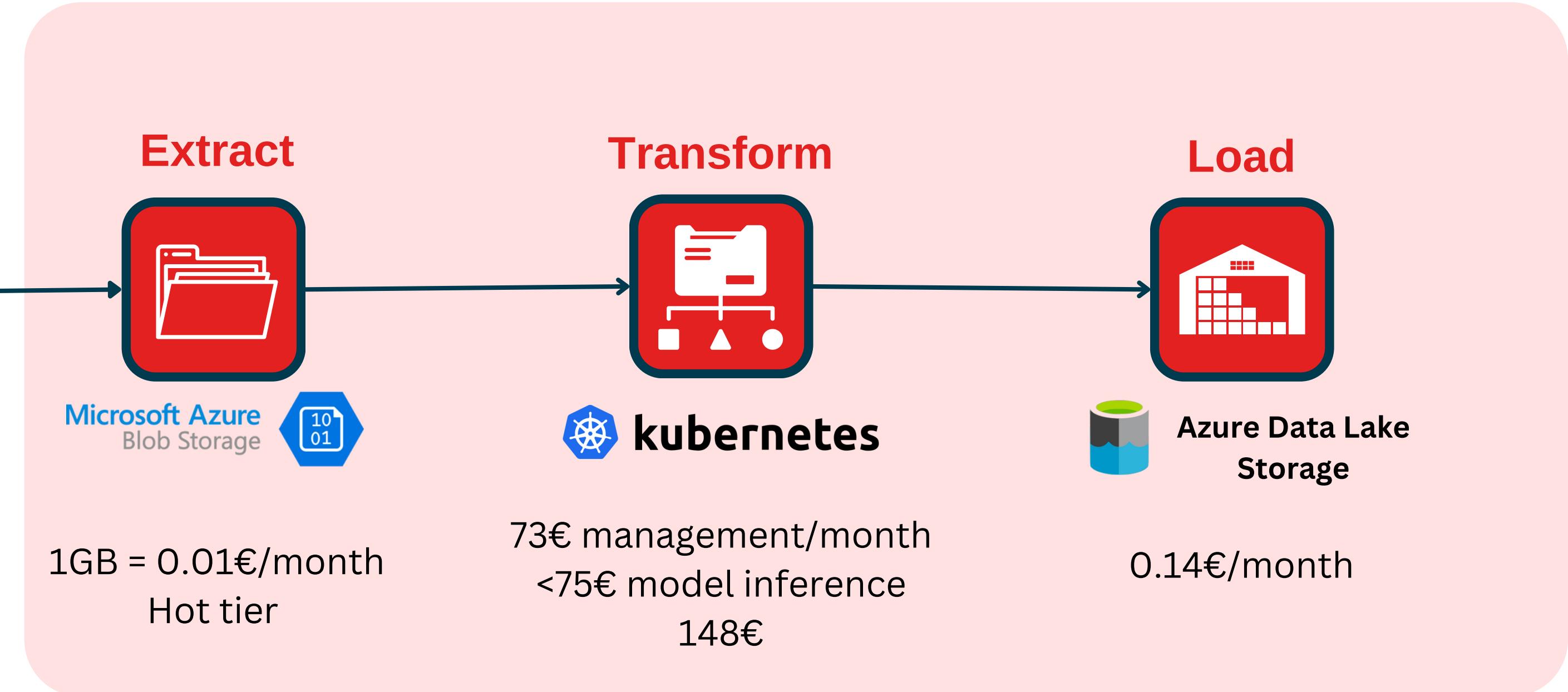
every 1000 inspections



UI

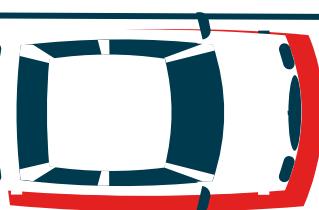


ETL



$$\text{ETL COST} = 73\text{€} + 75n\text{€}$$

* n = 1000 documents

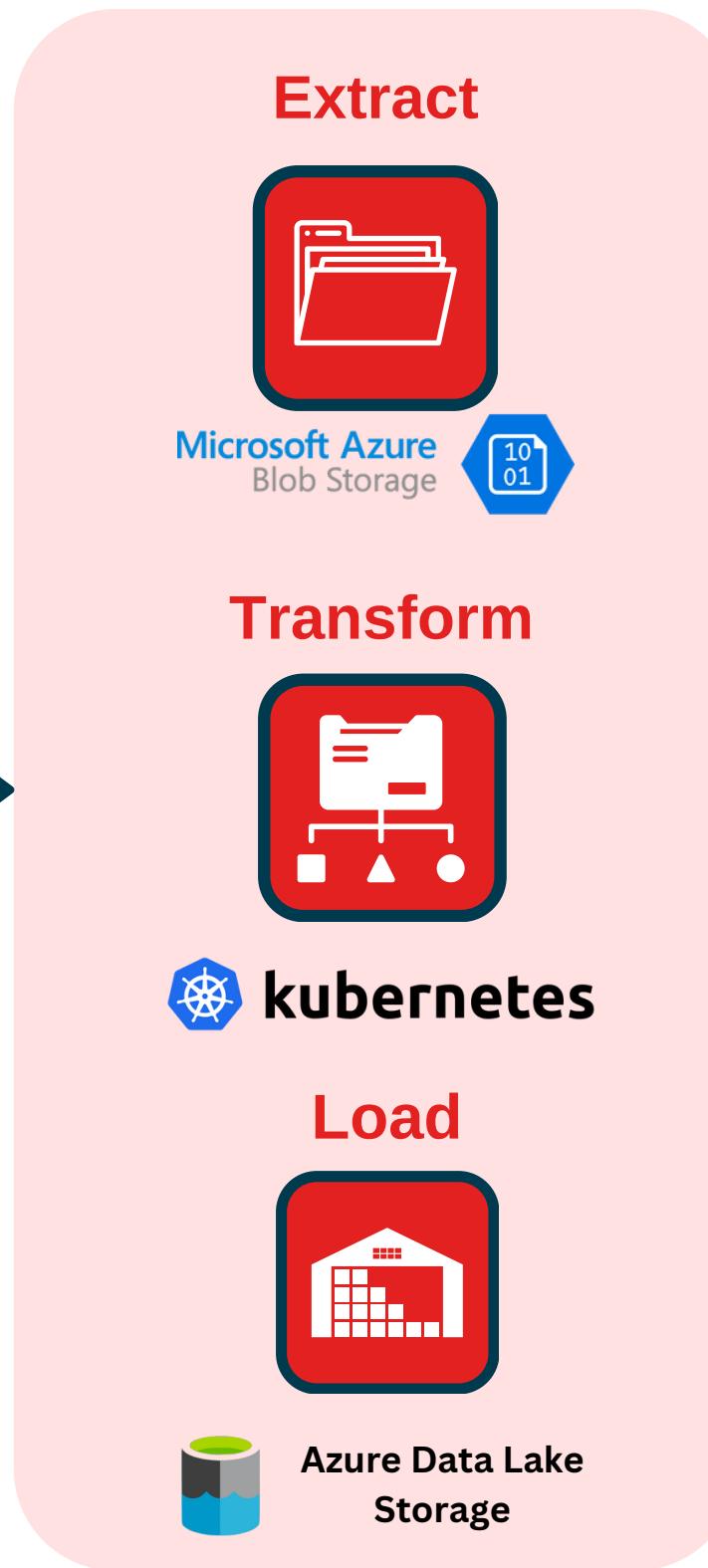
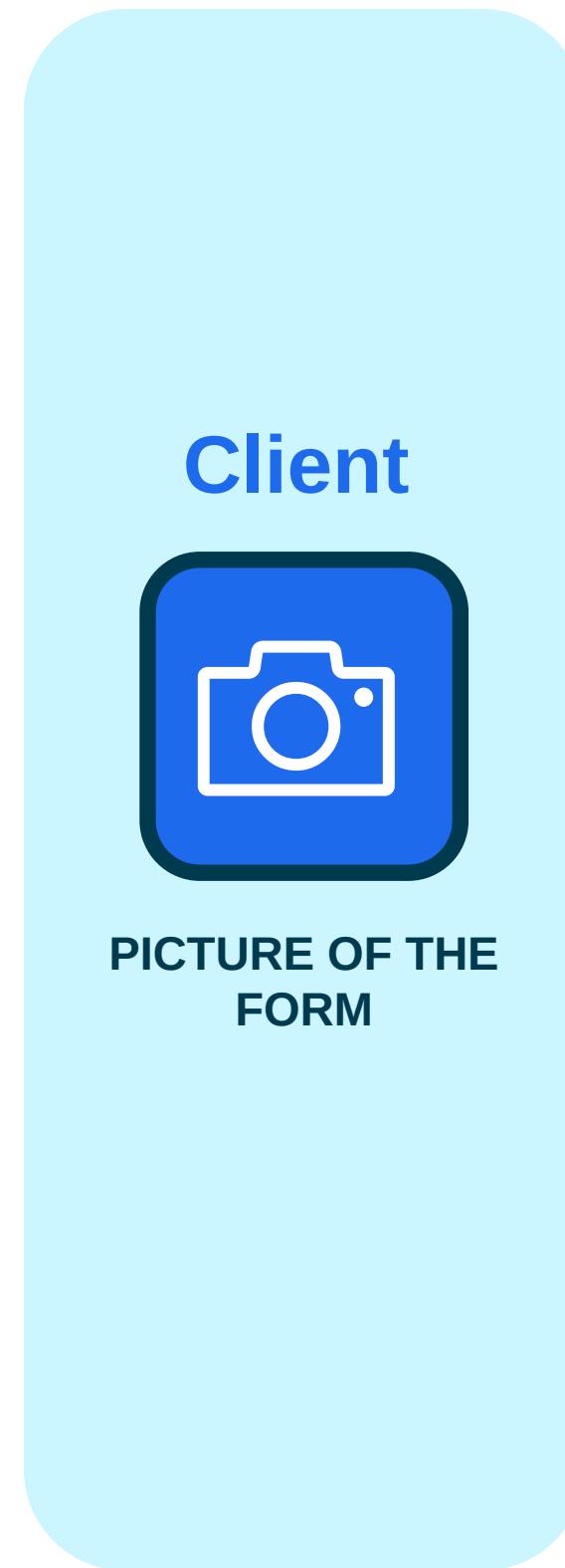


P

UI

ETL

CORP DATA



*n = 1000 documents

73€ + 75n€

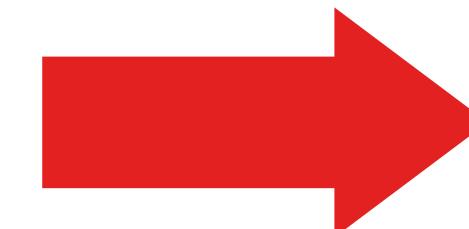
72€ + 40n€

MONTHLY COST

N documents: 1000

N daily documents/ inv: 15

N of investigators: 10



Days to analyze 1k documents: 6

Salary: 1500 euros /month



Price per 1k docs

3.4k euros

PRICE DROP FOR 10K DOCS

34,000€



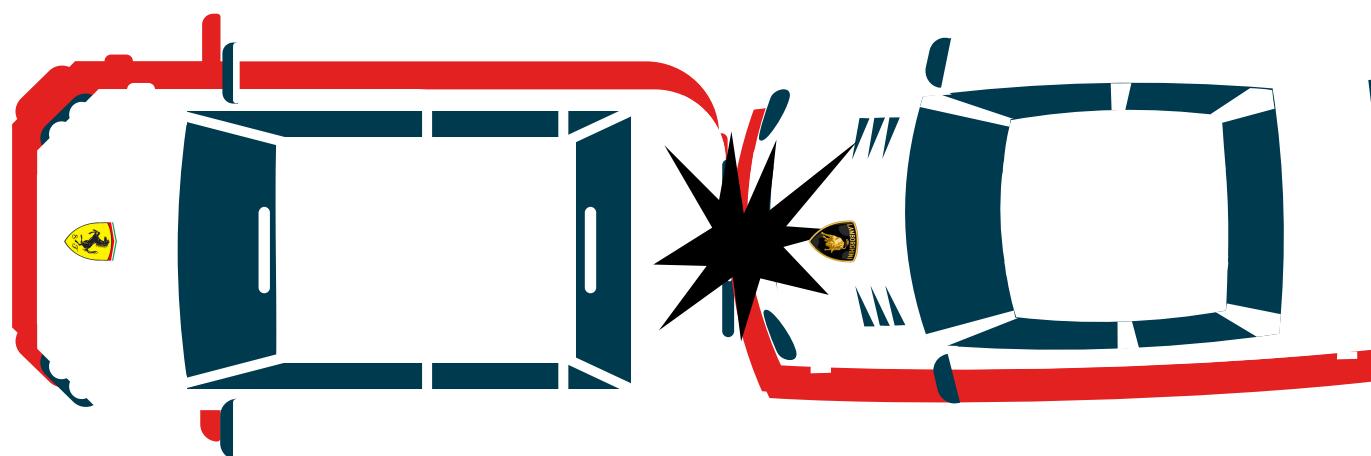
~1,300€

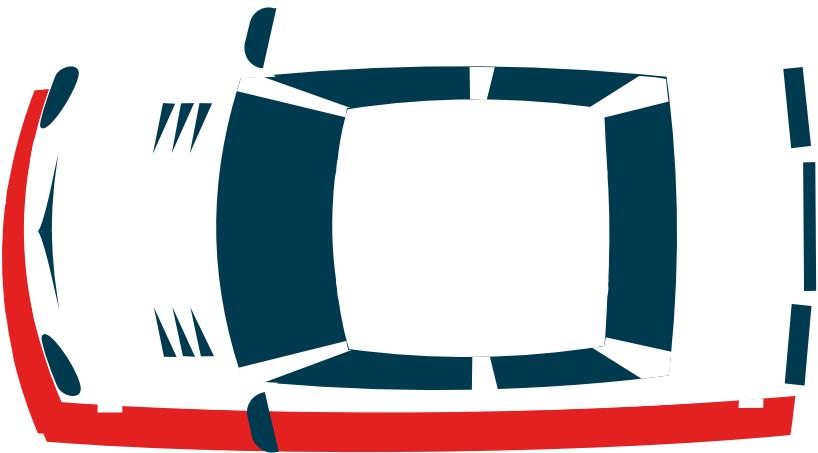
145€ + 115n€

*n = 1000 documents

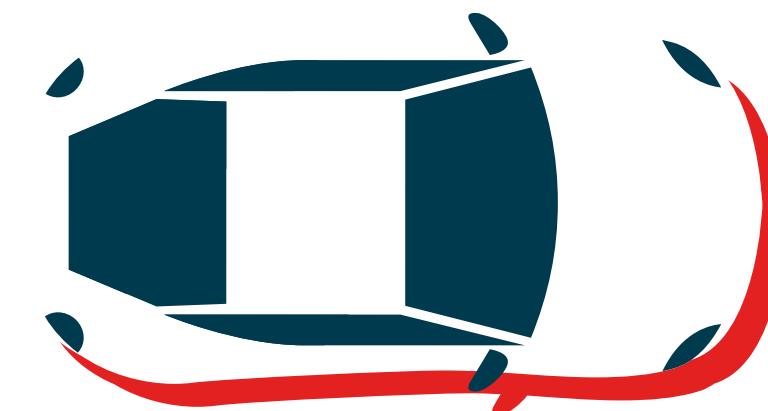
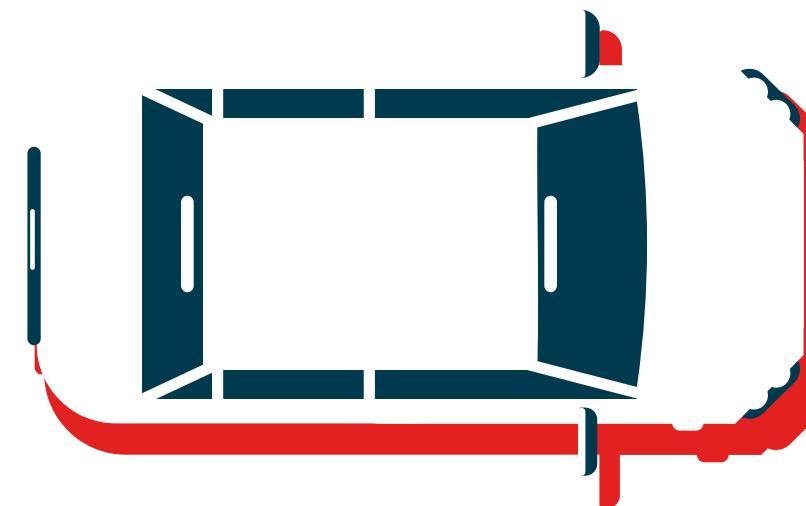
FINAL PRICE

Number of documents	TRADITIONAL APPROACH Price per month	AIINSURANCE Price per month
1K	3.4K	260€
5K	17K	720€
10k	34K	1295€

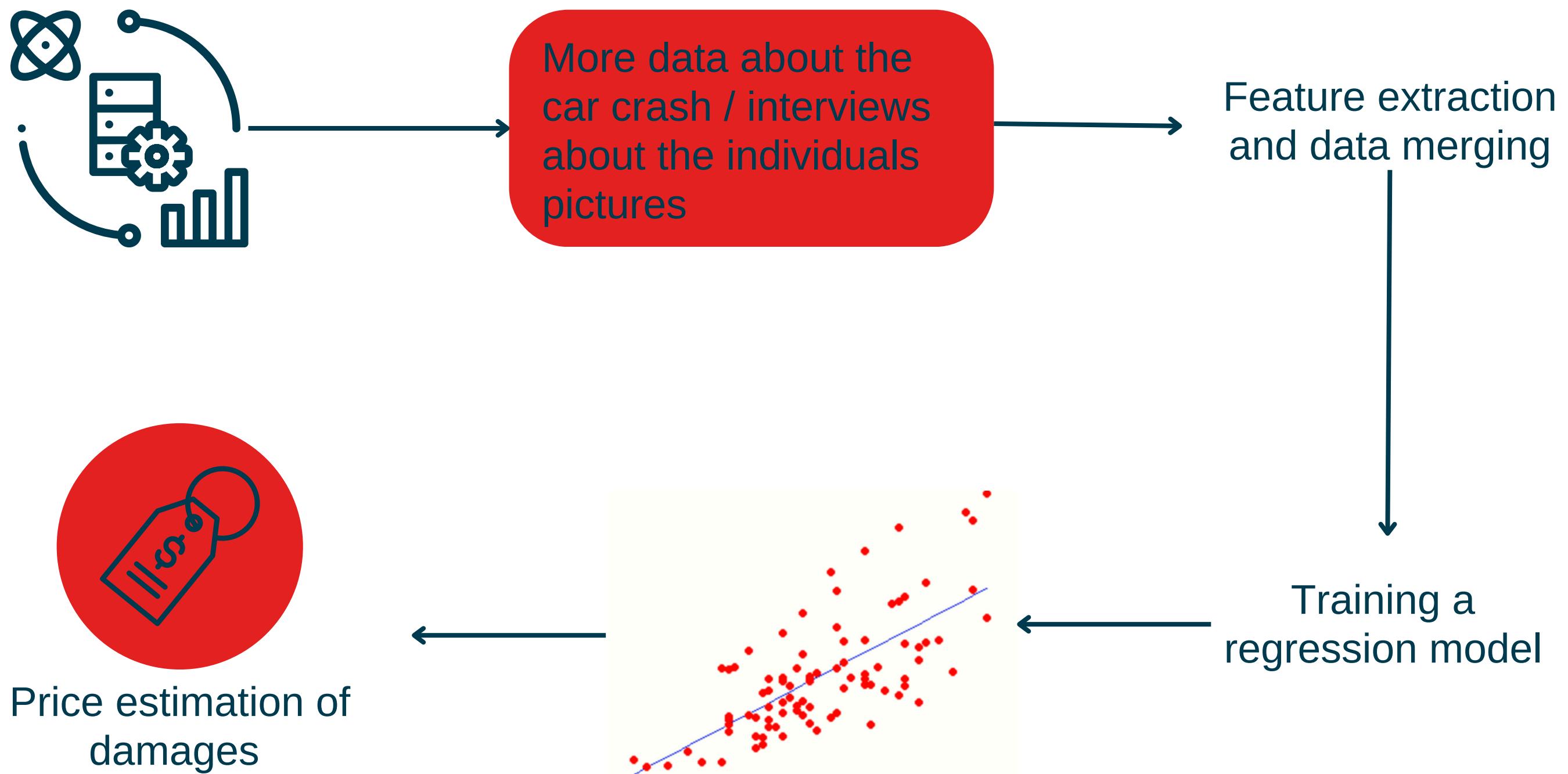




FUTURE IMPROVEMENTS



REGRESSION MODEL FOR COSTS ESTIMATION



UI

Client



PICTURE OF THE FORM

Extract



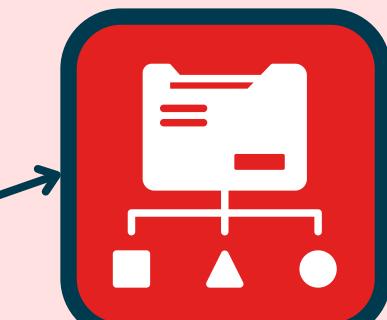
Microsoft Azure
Blob Storage



1GB = 0.01€/month
Hot tier

ETL

Transform



databricks

5.81€



Amazon Textract

50€

Load



Azure Data Lake
Storage

0.14€/month

ETL COST = 56n€

*n = 1000 documents



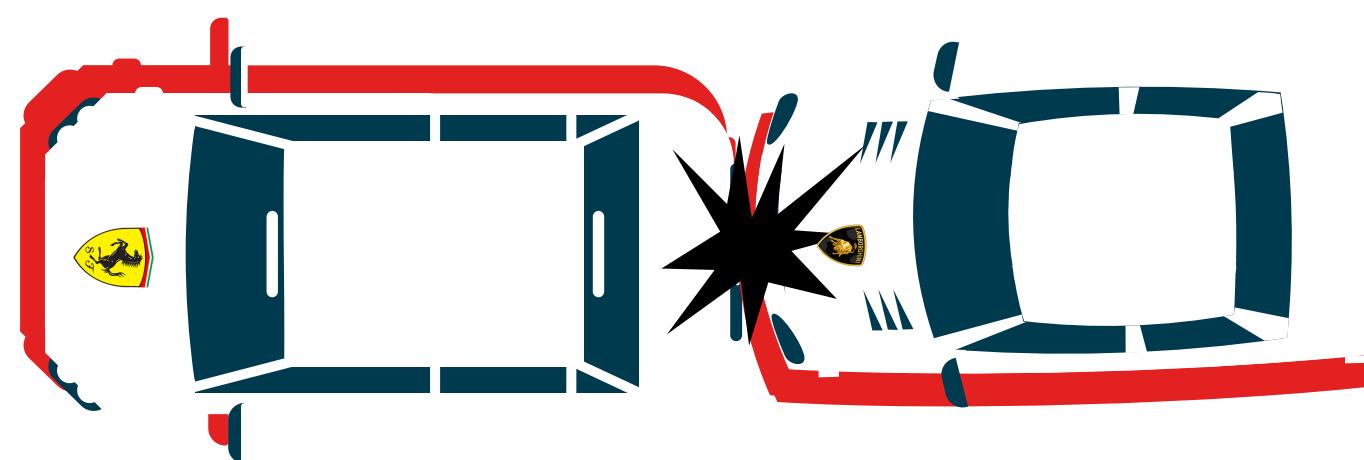
P

72€ + 90n€

*n = 1000 documents

FINAL PRICE

Number of documents	TRADITIONAL APPROACH Price per month(€)	AIINSURANCE Price per month	AWS Price per month
1K	3.4k	260€	162€
5K	17k	720€	522€
10k	34k	1295€	972€



PRICE DROP FOR 10K DOCS

34,000€



~1,300€



~972€

PRICE DROP FOR 10K DOCS

+97%

Cost Reduction

A scene from the Pixar movie Cars. Lightning McQueen, a bright red race car with a smiling face, is on the left. Mater, a blue tow truck with a smiling face, is on the right. They are positioned in front of the iconic Radiator Springs mountains at sunset. The sky is filled with warm orange and yellow hues.

THANKS

A
INSURANCE

WANT TO SEE IT IN ACTION ?