

A futuristic robot with white and blue joints is holding a glowing cube of binary code (0s and 1s) in its hands. The robot's arms are extended towards the center of the frame. The background is a light blue gradient.

# ***Trust AI to Lead your Insurance Business***

*September 2019*



The better the question. The better the answer.  
The better the world works.



**EY**

**Building a better  
working world**



# brief

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What is AI and its impacts in insurance

2

Our Value Proposal

2a

EY SCEFI

2b

EY Pricing Tool

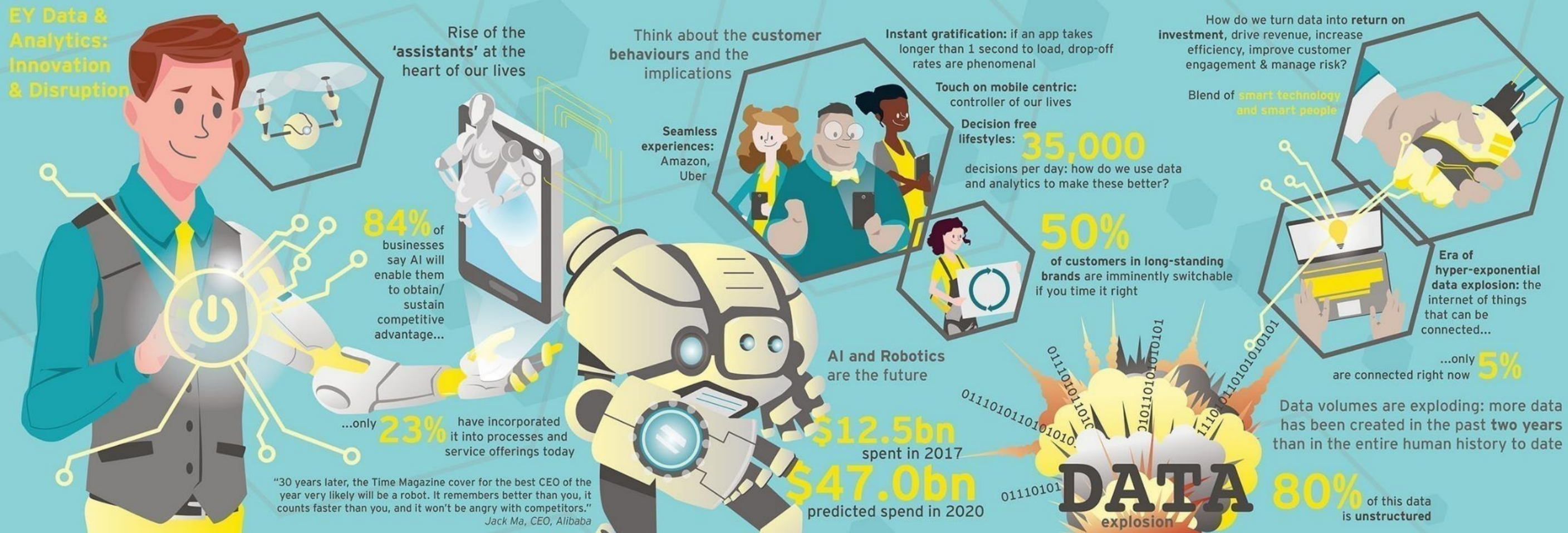


# 1/ What is AI and its impacts on insurance

*"Can machines think?"* Alan Turing, 1950



# AI and the abundance of digital data create many opportunities for the insurance industry



# Artificial Intelligence: what are we talking about?

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What is intelligence?

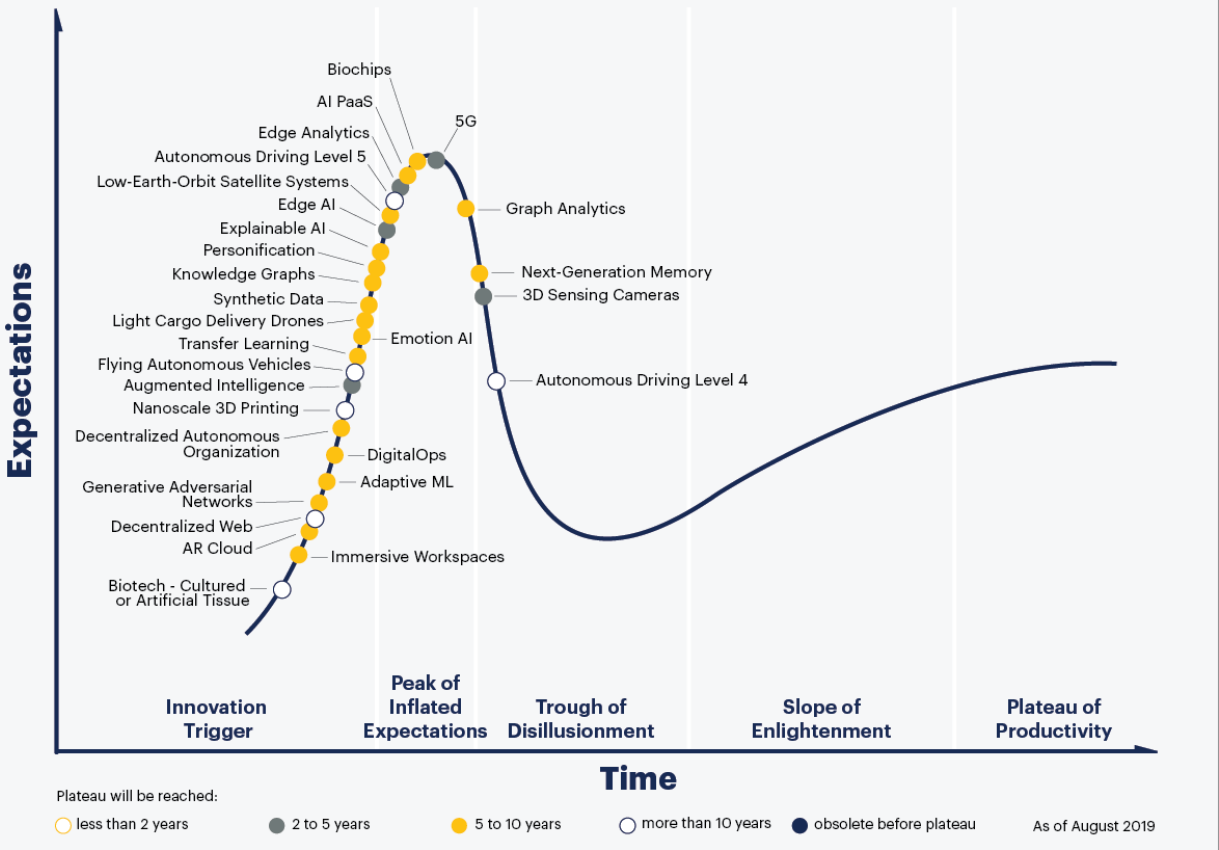
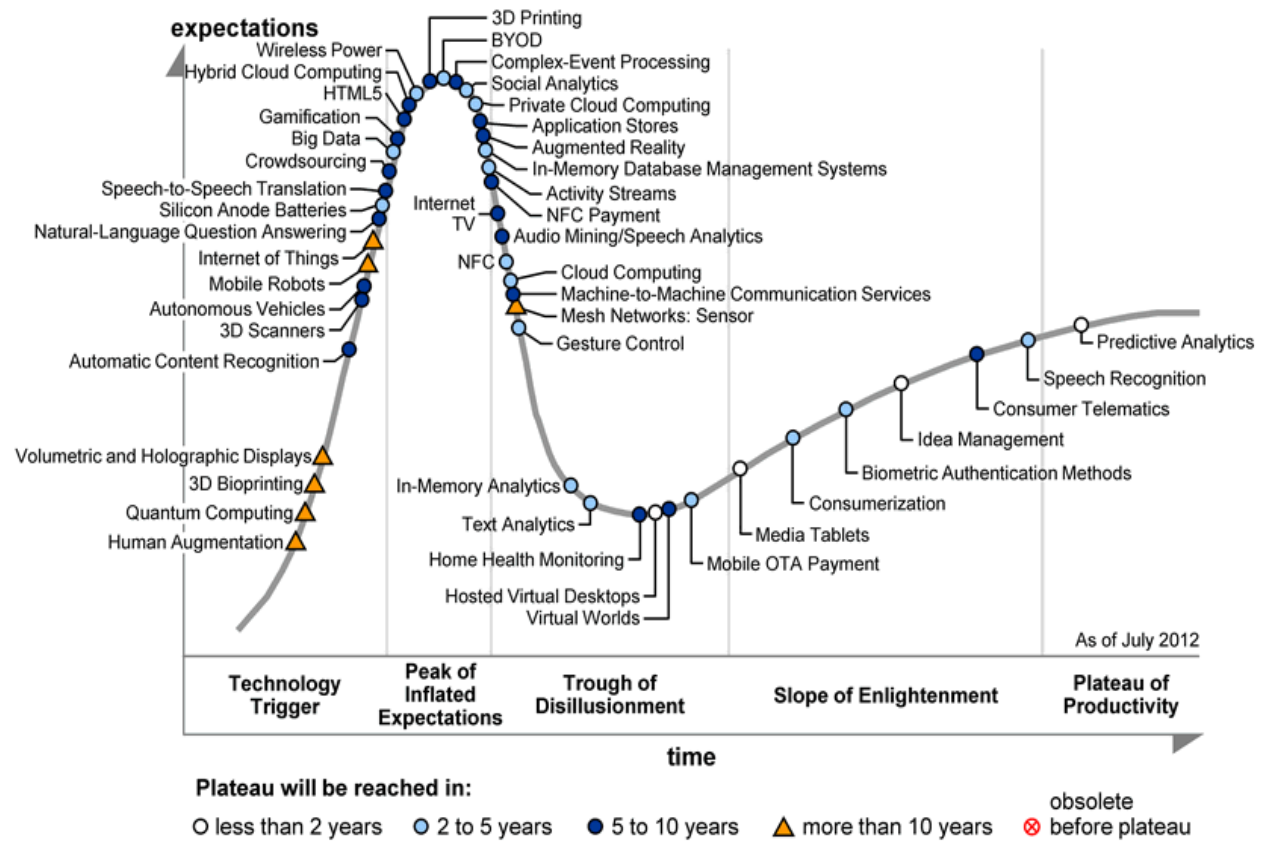
Is it the ability to perceive the world, to predict the immediate or distant future, or to plan a series of actions to make a decision and achieve a goal?

Is it the ability to learn, or is it the ability to apply one's knowledge wisely?

« **Artificial intelligence (AI)** is a set of **Techniques allowing machines to perform tasks** and solve problems normally **reserved for humans** and some animals. »

*Yann Le Cun* Introducing **Collège de France**  
(Head of AI Research Division at Facebook from 2013 to 2019)

# Gartner Hype Curves



[gartner.com/SmarterWithGartner](https://gartner.com/SmarterWithGartner)

Source: Gartner  
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# Artificial Intelligence is booming in insurance...

## KEY MARKET FIGURES

124  
M\$

Average investment by the world's leading insurers in 2015 in AI technologies. Key features impacted: IT, Customer Service, Finance, Marketing - Sales  
#1 among the world's 13 largest industries

0.52%

Average share of sales of major AI insurers in 2015  
#3 among the world's 13 largest industries

\$2  
billio  
n

Funds raised by Insurtech worldwide in 2019

## OF THE GAME IN THE FRONTIERE OF METIERS AND TECHNOLOGY

- New technological trends are profoundly changing the insurance business:
  1. Explosion of data from connected devices
  2. Increased prevalence of physical robotics
  3. Open source and data ecosystems
  4. Advances in cognitive technologies
- The challenge, then, is to move from "detection and repair" solutions to so-called "prediction and prevention" solutions, transforming all aspects of the industry: from distribution to claims management to underwriting and pricing

Sources: TCS, Fintech.Global, EY Analysis

# Artificial Intelligence asks insurers questions

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## PERSONALIZATION: MUTUALIZATION VS. Individualization

- How much customization does AI allow?
- What are the limits in personalization for each customer?
- How to receive this personalization by customers identified as "at risk"?

## IMPACT OF THE PREDICIBILITY ON ASSURANCE PRODUCERS

- How can the insurers' business model be changed to take risk predictability into account?
- What are the evolutions for actuaries in a more predictable world?
- What is the balance between prevention, surveillance and treatment?
- New insurance opportunities with AI?
- How can expertise evolve with AI?

## EVOLUTION OF THE INSTORE

- What ethics for insurers with Artificial Intelligence in the insurer-insured relationship and insurance products?
- How do you go from risk coverage to supporting clients' lives?
- What positioning on data sharing?
- What are the impacts of increasing customers' knowledge of their risks through AI?
- What about collaborative insurance with AI



# Illustrations of some cases of use by AI application domain

## CUSTOMER RELATIONSHIP MANAGEMENT

XTRA Conversational Agent, hosted in a dedicated mobile application, whose goal is to accompany the user in his daily life

*Good Doctor* : can abine that diagnoses and prescribes drugs to patients through an artificial intelligence system

## PRODUCT DESIGN

Virtual assistant helps insurance advisors make decisions and directs them to the products most likely to meet their needs

Platform for insurers to correlate driving behaviour with their customers and adjust premium accordingly

## SINISTER GESTION

Bot AI that analyzes the disaster's request and treats it in 3 seconds in 25% of cases. The rest of the requests are forwarded to the advisors

Using medical certificates, care bills and the insurance contract, IBM's Watson calculates the amount of compensation. This must be validated by the employee.

Tractable uses the Deep learning to automate post-disaster damage assessments

First drone robot solution for insurance experts who can use an iPad

## Prevention

New feature implemented in the app MyHealth to detect symptoms, provide a diagnosis and determine if treatment is needed

Drone insurance that identifies at-risk flyover zones (determined by AI) and thus reduces the number of accidents of its users

## Fraud

Start-up offering AI solutions against bank and insurance fraud

Intelligence system that processes suspicious applications and uses data collected to improve fraud detection

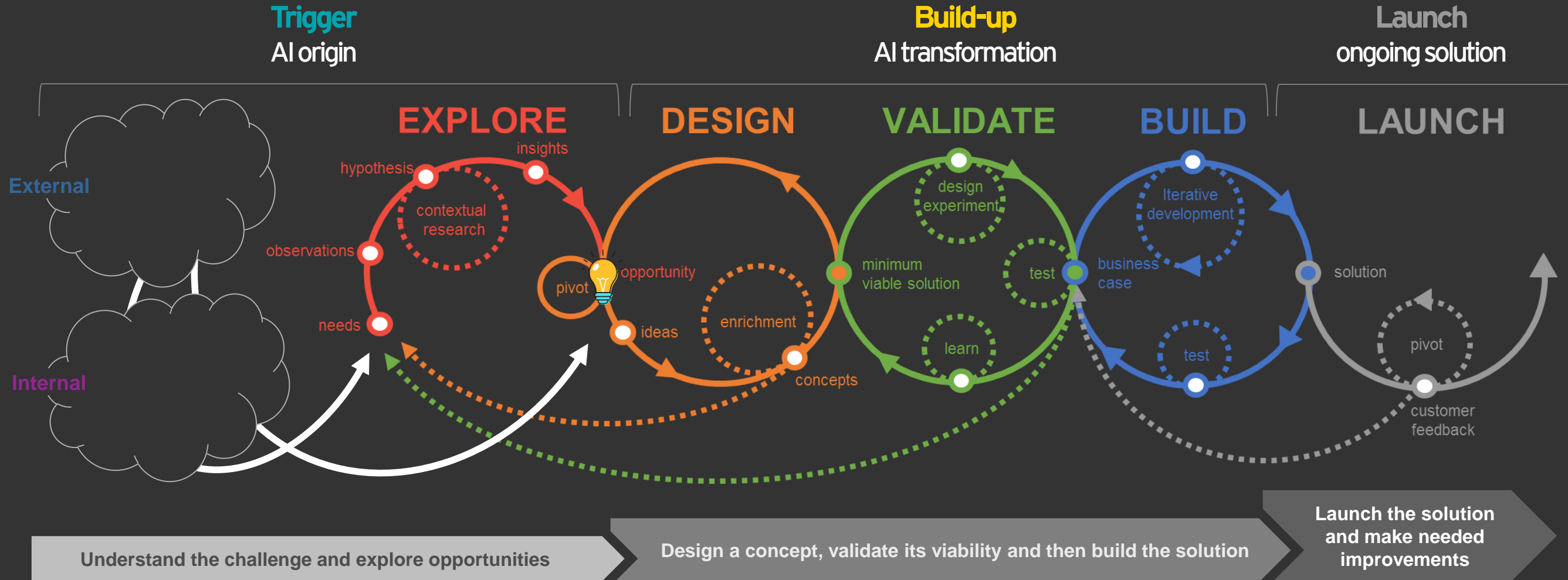
Machine learning algorithm detecting anomalies and frauds (75% of cases detected fraudulent)

# 2/EY Value Proposal

# Insurance TechLab

## How does they work?

AI Innovation begins by understanding the needs and challenges of any business ecosystem. Once this is done, exploring new ideas to build new solutions comes next. Having an Insurance Techlab dedicated to the complete innovation process, helps you catch the next wave of radical change and growth in the insurance sector, and gain market share.





# 2a/EY SCEFI

EY Smart Claims Evaluator and Fraud Investigator

# AI Insurance assets | EY SCEFI | Overview

A web application that evaluates claims and detects fraud



From a broken phone to a repaired phone by using EY SCEFI



EY SCEFI is a web application that can be used for:

## Policy management

- ❖ Manage policies
- ❖ Ask questions to a chatbot
- ❖ Register assets under a policy
- ❖ Upload receipts
- ❖ Extract information from the receipt using SIRE (EY OCR tool)
- ❖ Integrate into existing insurance systems (e.i. using RPA)

## Claims management

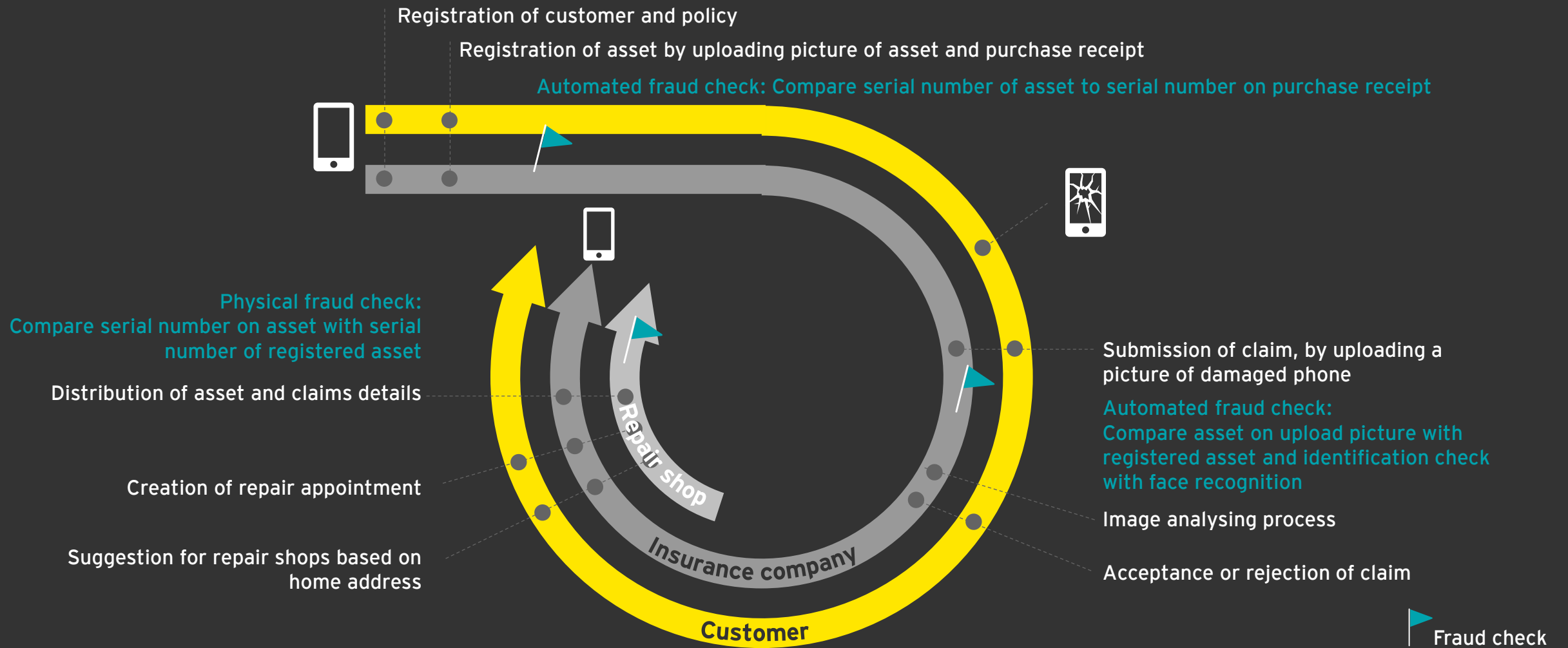
- ❖ Submit claims
- ❖ Perform **image analysis** process for detecting damage
- ❖ Perform a fraud check using **image analysis** process
- ❖ Fraud detection refinement **using machine learning**
- ❖ Analyse claims without interaction with claims handlers
- ❖ Increase claims approval and denial response accuracy using **machine learning**

## Repair

- ❖ Refinement of the repair process using **machine learning**
- ❖ Provide repair shop suggestions
- ❖ Make a repair appointment
- ❖ Share information with repair shop using RPA
- ❖ Physical fraud check by repair shop

# AI Insurance assets | EY SCEFI | Overview

A web application that evaluates claims and detects fraud





# AI Insurance assets | EY SCEFI | Overview

A web application that evaluates claims and detects fraud

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## The three building blocks:

### **A** Web application

End-to-end and interactive digital solution that combines smart policy management, smart claims management and processing to achieve higher customer satisfaction and a more efficient claims process.

### **B** Image recognition

For analysing the picture of the damaged asset an image recognition algorithm is used. The damage percentage output is applied to a weighting scale to determine insurance coverage.

### **C** Integration into insurance system

The information collected via the web application can be integrated into the insurance system throughout the policy life cycle, claims processing and closing using OCR and RPA allowing lower claims costs and faster processing.

# AI Insurance assets | EY SCEFI | Outcomes

A web application that evaluates claims and detects fraud

Fraud checks are implemented throughout the different stages of the customer journey



## Registration

Face recognition is used as identity check

- ❖ When the customer creates an account, the customer must take several pictures for face recognition purposes

Optical character recognition (OCR) is used as verification check

- ❖ For completing the profile of the gadget, the customer must upload purchase receipt as proof of purchase
- ❖ Using OCR the information on the receipt is extracted and automatically populated in insurance systems



## Claims submission

Face recognition is used as identity check

- ❖ During the claims submission process the customer looks in the camera for face recognition as an identification check

Image recognition is used as verification check

- ❖ The customer must upload a picture of the damaged gadget, therefore this picture can be compared with the picture of the gadget uploaded during the registration process



## Repair shop

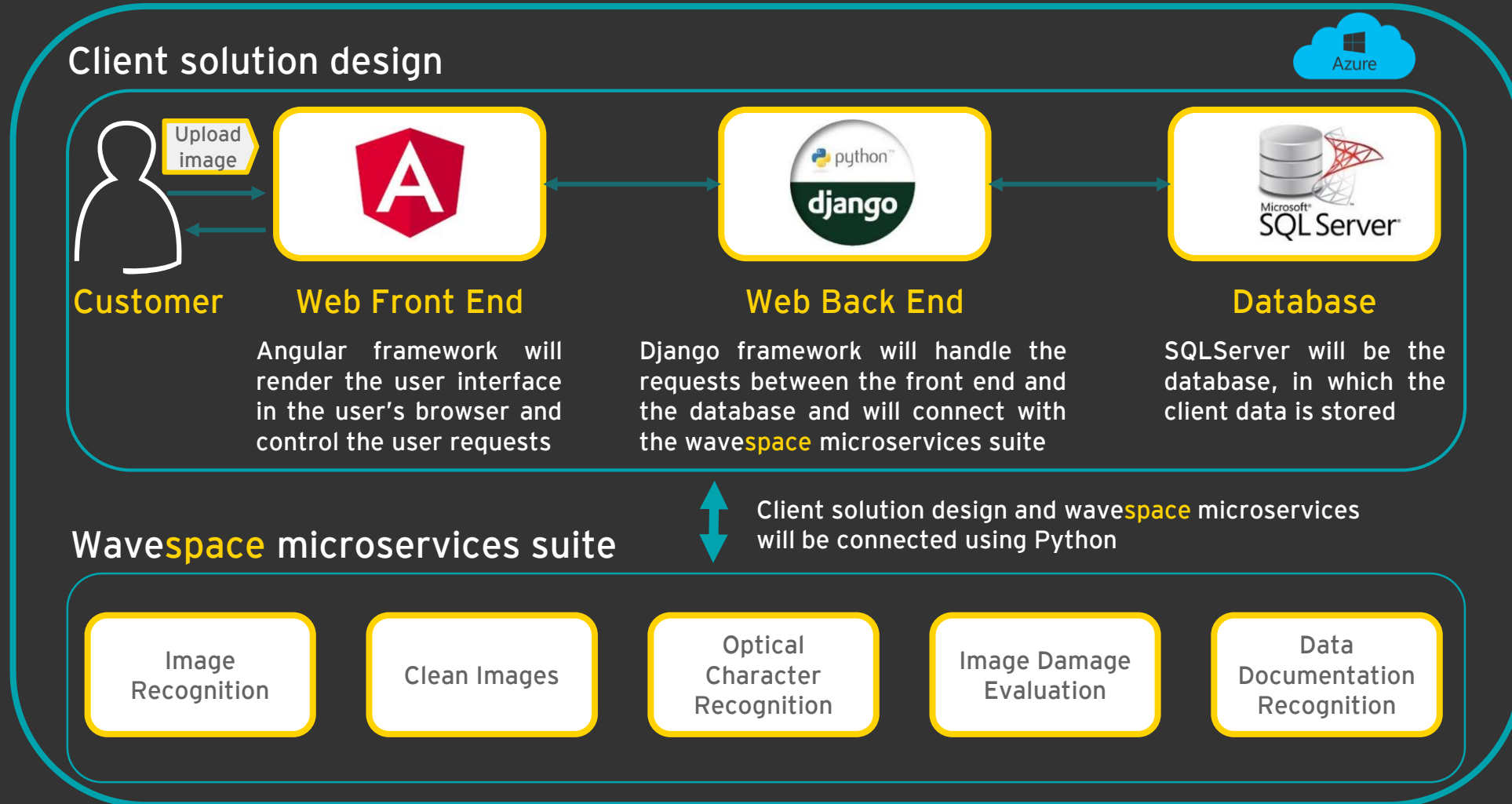
Physical verification check

- ❖ Repair shop receives from the insurance company the phone details, therefore the repair shop can check whether the IMEI (serial) number of the phone and phone type is the same as in the insurance contract

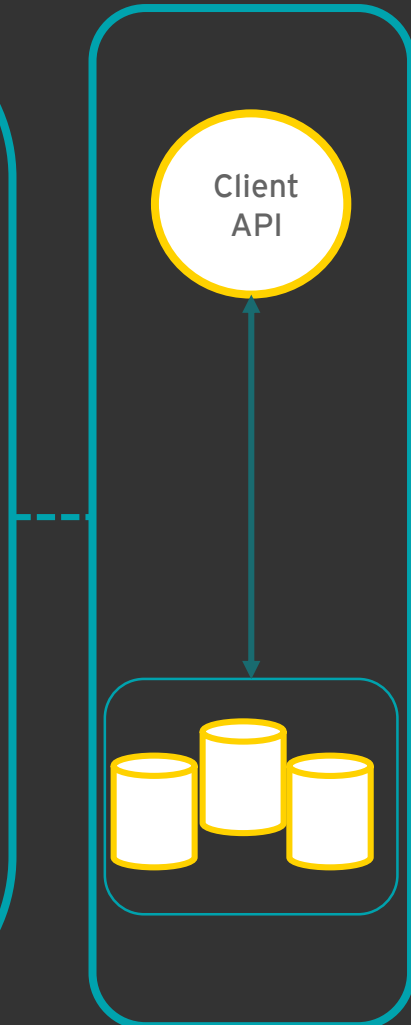
# AI Insurance assets | EY SCEFI | Architecture

A web application that evaluates claims and detects fraud

## EY Secure Environment



## Client Environment





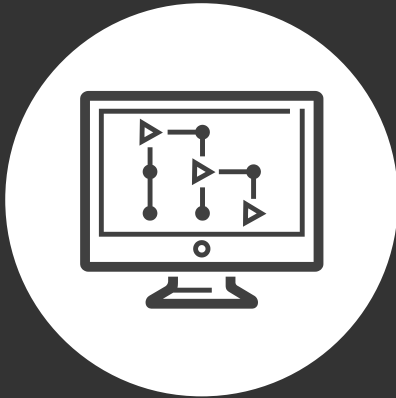
# 2b/EY Pricing Tool

# AI Insurance assets | EY Pricing Tool | Overview

Machine Learning for Insurance Pricing and Price Elasticity Modelling

Machine Learning for Insurance Pricing - Prediction model of individual customer price elasticity and prescription model for revenue maximization.

## Available data



- Client historical information
- Postcode based information
- Elasticity modelling information
- External data enrichment

## Our value proposition



- State-of-the-art **Data Analytics and ML** expertise
- In-depth business understanding
- Experienced Insurance team

## Project objectives

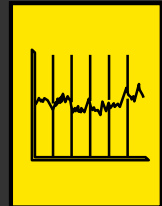


- Predict using **ML models**, if the customer will renew the insurance policy given the proposed price
- Optimize the price for each client based on their price elasticity

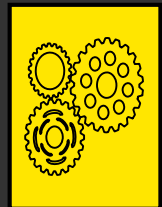
# AI Insurance assets | EY Pricing Tool | Outcomes

Machine Learning for Insurance Pricing and Price Elasticity Modelling

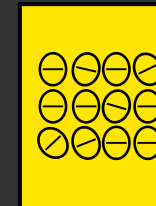
By combining **Data Analytics** and **Machine Learning** expertise with our industry knowledge we have achieved the following outcomes for the client:



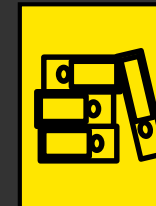
Improvement of the GLM baseline results using **ML models**



Interactive dashboards to enhance understanding of data driven results



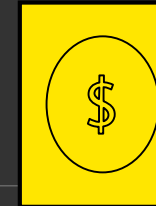
Improvement of the client behaviour prediction accuracy



Optimal risk exposure for risk management purposes



Elasticity analysis for individual clients

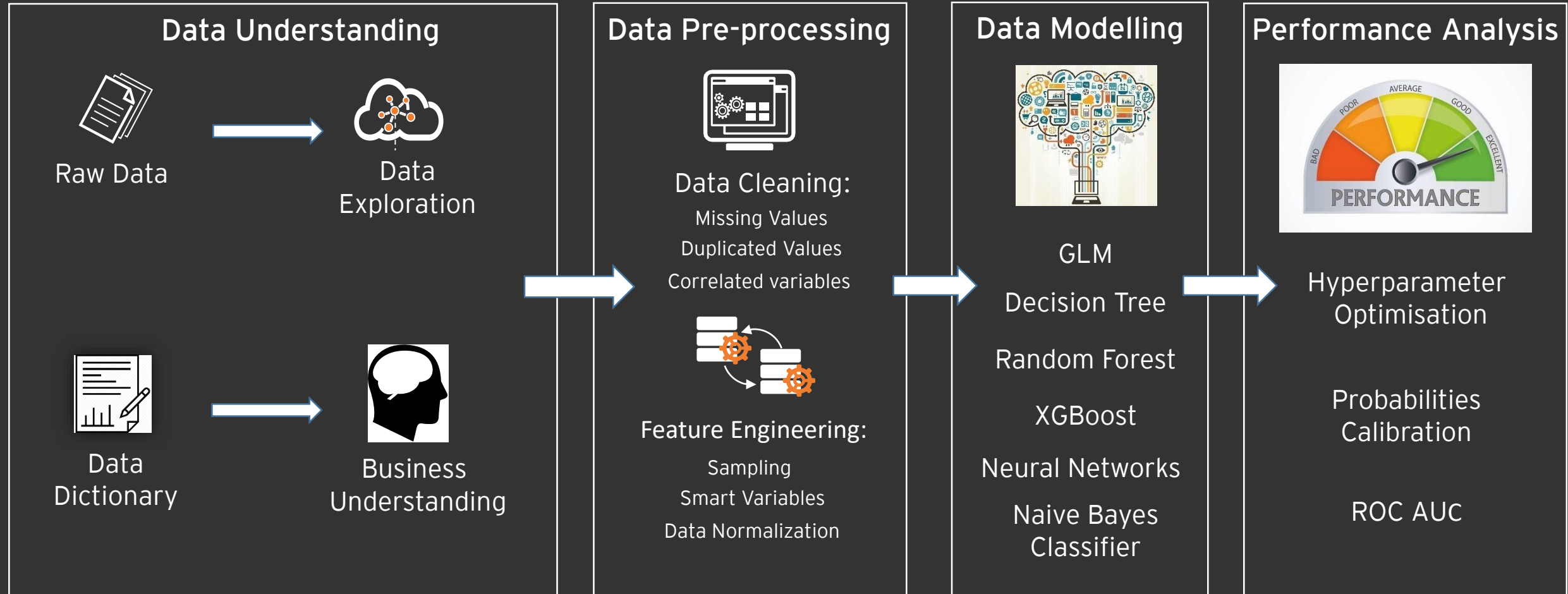


Calculation of the optimal price for each client



# AI Insurance assets | EY Pricing Tool | Approach

Machine Learning for Insurance Pricing and Price Elasticity Modelling



# AI Insurance assets | EY Pricing Tool | Model selection

Machine Learning for Insurance Pricing and Price Elasticity Modelling

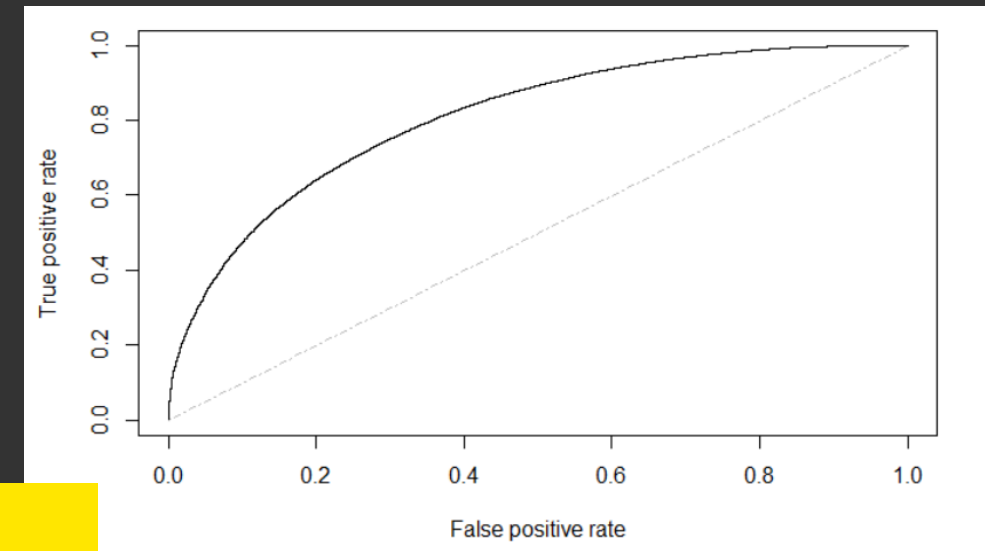
We have trained several ML models, evaluated them with respect to the chosen metric and made a benchmark comparison to find the best model.

Model	ROC AUC
GLM	0.72
GLM on clustered data	0.74
Naive Bayes	0.66
Random Forest	0.74
Neural Networks	0.76
Simple XGoost	0.73
XGBoost with Bayesian Optimization	0.79

**Benchmark**

**Benchmark  
improved by 10%**

ROC AUC

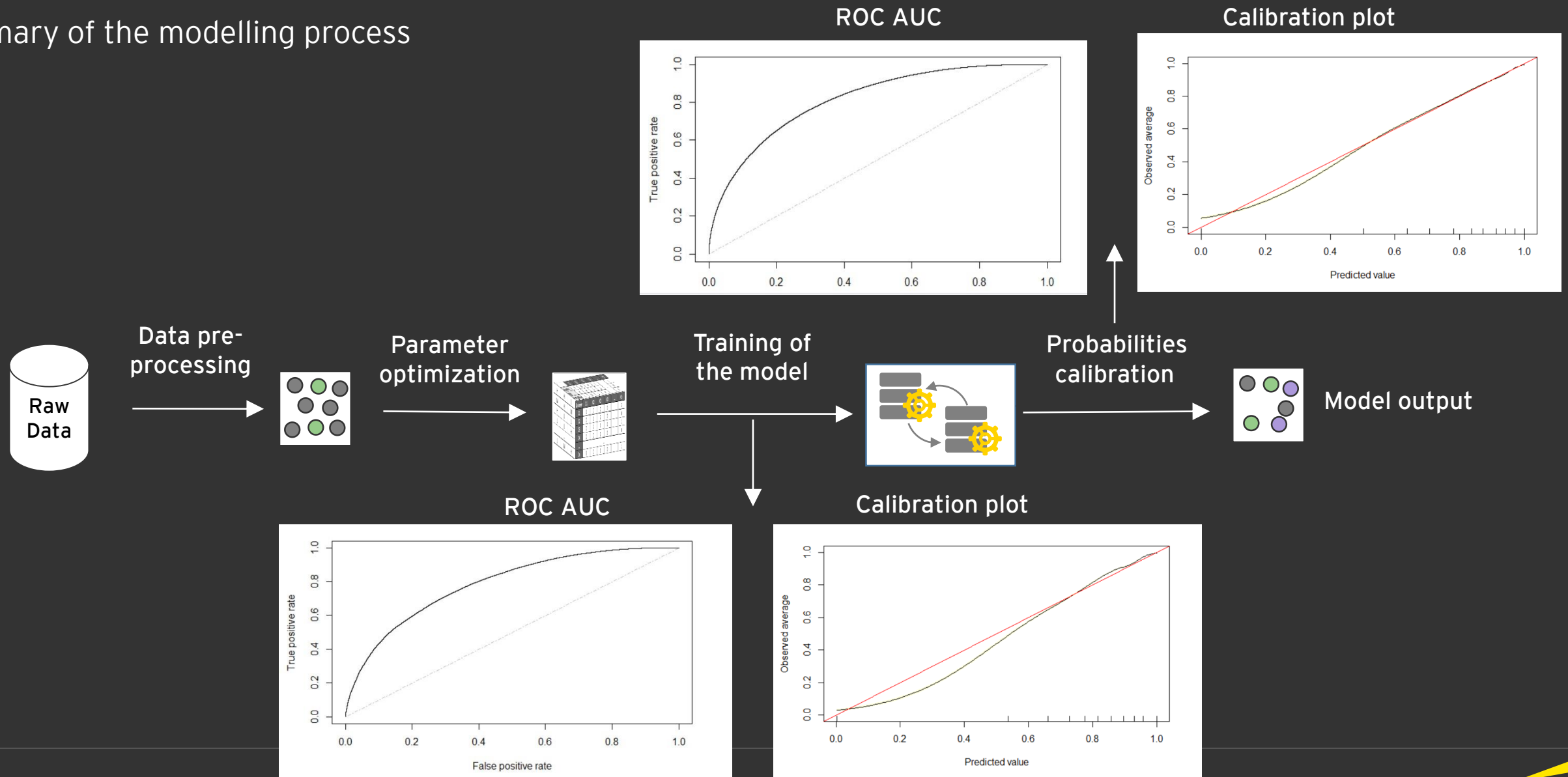


\*ROC AUC = Receiver Operating Characteristic curve, Area Under the Curve, is a graphical plot that illustrates the diagnostic ability of a binary classifier system as its discrimination threshold is varied.

# AI Insurance assets | EY Pricing Tool | Performance analysis

Machine Learning for Insurance Pricing and Price Elasticity Modelling

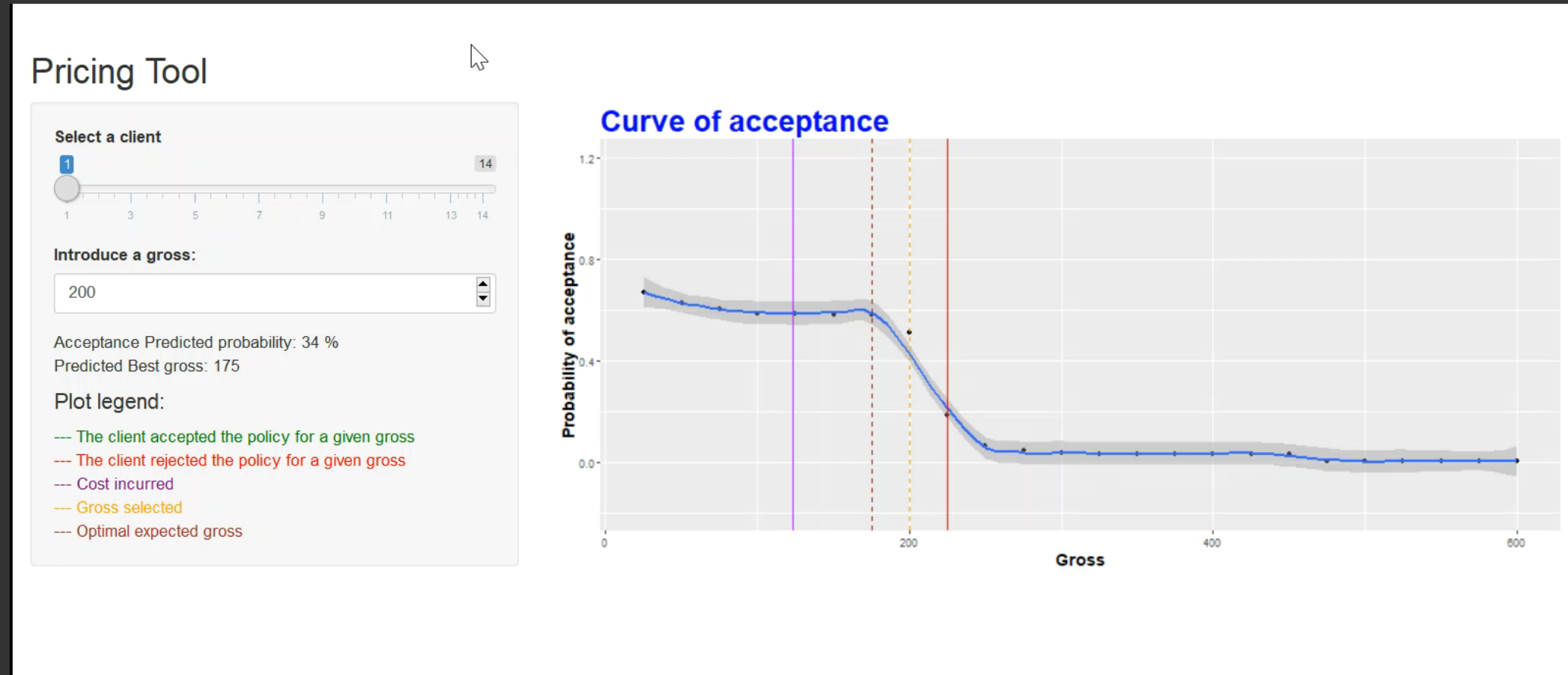
Summary of the modelling process



# AI Insurance assets | EY Pricing Tool | Elasticity modelling

Machine Learning for Insurance Pricing and Price Elasticity Modelling

Based on the trained machine learning model we construct acceptance rate curves for individual clients in order to study price elasticity of individuals with respect to the price change.

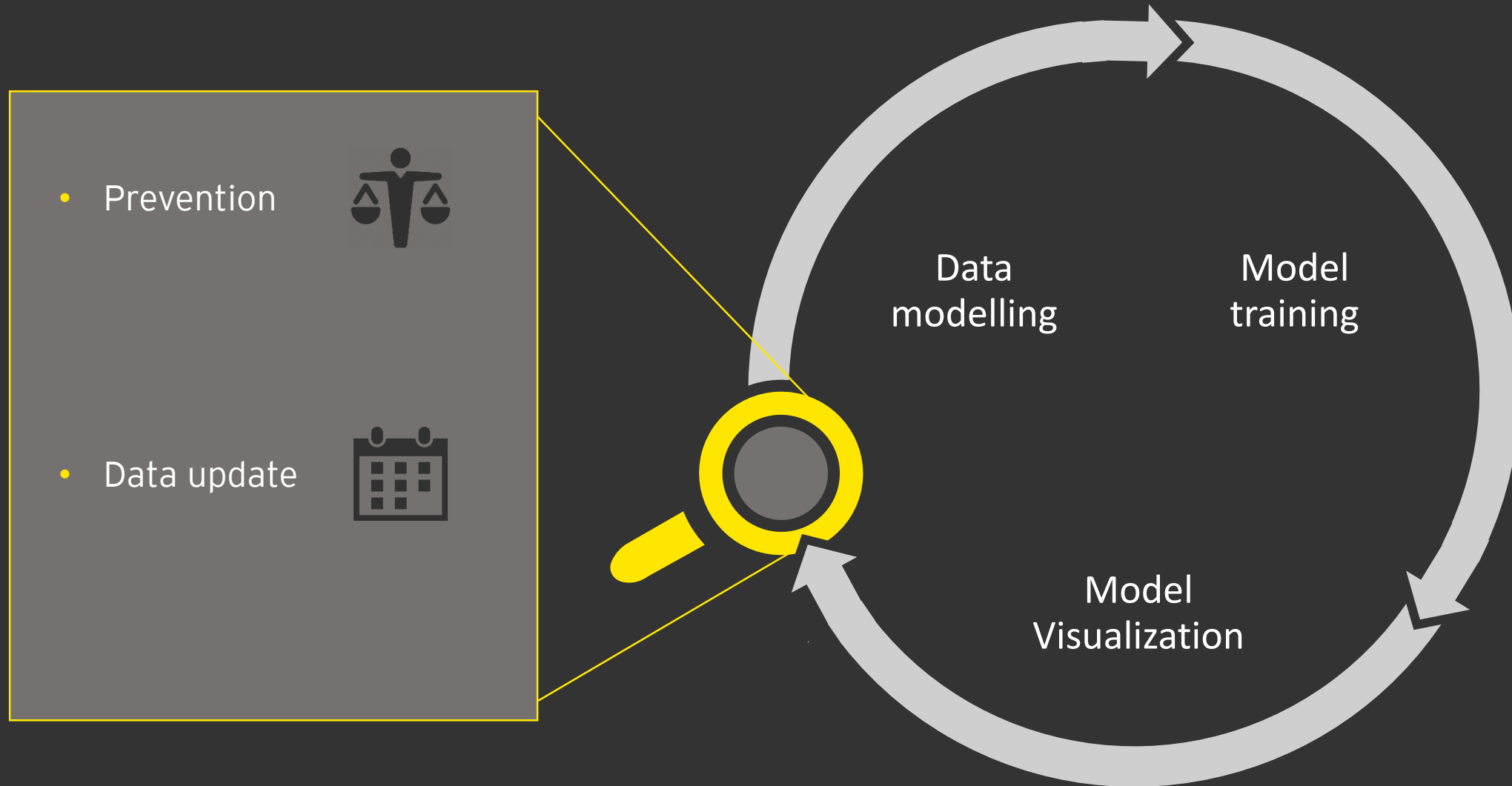




# AI Insurance assets | EY Pricing Tool | Feedback Loop and Prevention

Machine Learning for Insurance Pricing and Price Elasticity Modelling

EY pricing tool explanation API enable alignment between client expertise an AI pricing solutions.



**EY** | Assurance | Tax | Transactions | Advisory

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