
SCOR
The Art & Science of Risk

Merge data and actuarial science

Jisun Park

Senior Treaty Underwriter SCOR

05/10/2022

SCOR
The Art & Science of Risk

Speakers

Jisun Park

APAC alternative solution coordinator - SCOR P&C Alternative Solutions

Jisun Park is a senior treaty underwriter & APAC Alternative Solution coordinator of SCOR since 2022, he joined SCOR in 2018 as a pricing manager for SCOR APAC P&C. Previously, he spent 9 years in the Munich Re Korea and a client manager working on client relationship and then head of underwriting for treaty and facultative reinsurance. He is an actuary and hold a Master in data science from northwestern university in the US.

Place some text

Title of the page

Subtitle of the page

01 Machine learning in general

02 Tradition rate-making workflow

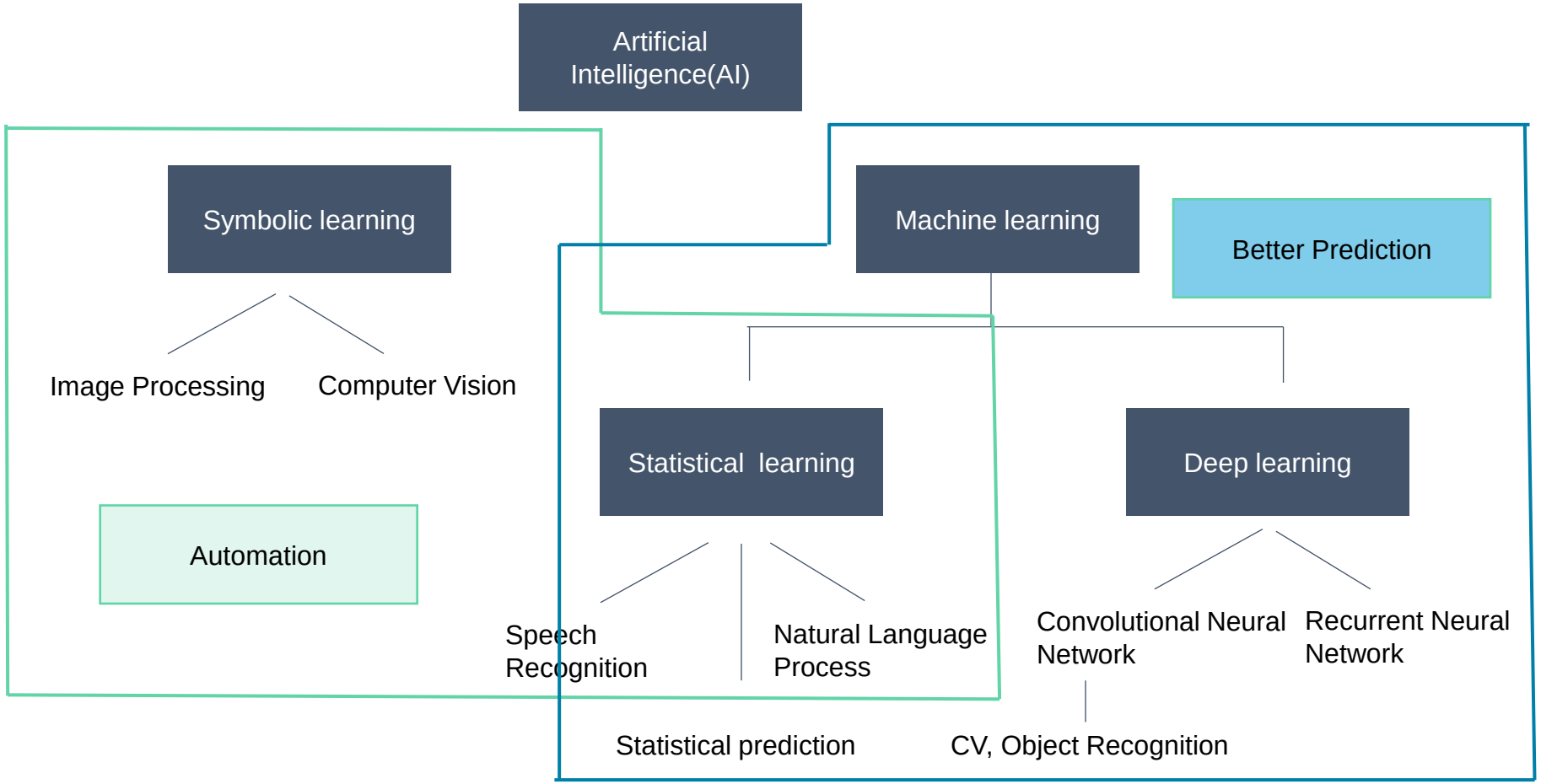
03 Rate-making workflow using ML/DL

04 Consideration

1. Machine learning in general

1. Machine learning in general

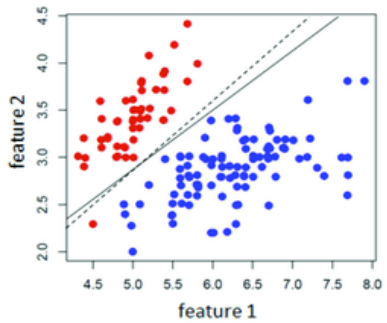
Deep Learning performance much better than other machine learning methods



SCOR The Art & Science of Risk

1. Machine learning in general

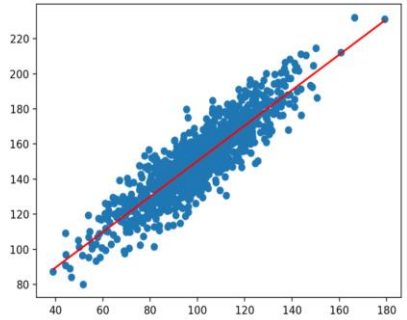
Actuaries are familiar with prediction model. However, necessity of knowing classification model is increasing



Classification

Machine learning algorithm

Prediction



- Logit classification
- Decision Tree
- Random Forest
- Support Vector Machine
- K Nearest Neighbor

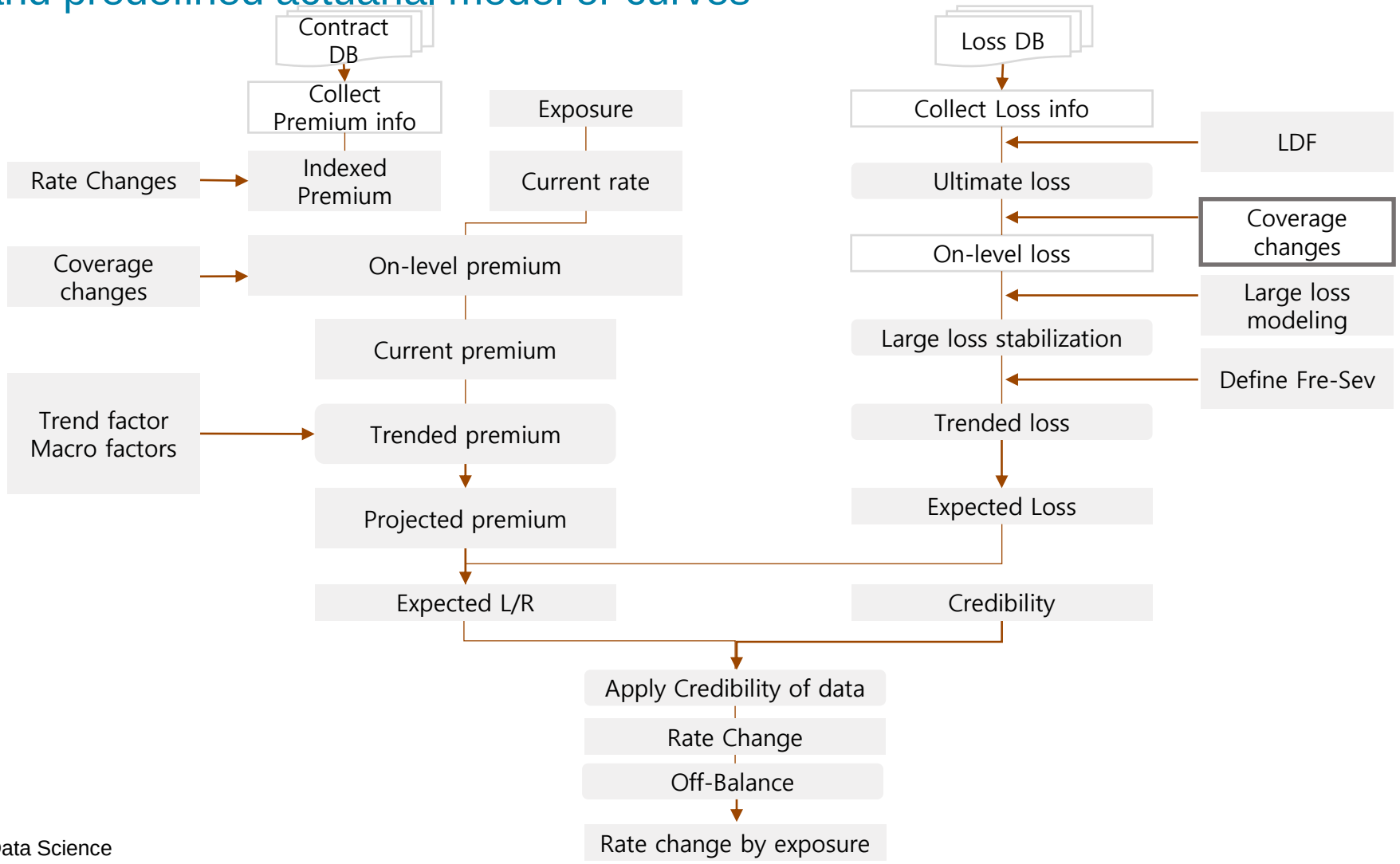
- Linear Regression
- Lasso Regression
- Random Forest Regression
- Support Vector Regression
- Gradient Boosted Model

SCOR The Art & Science of Risk

2. Tradition rate-making workflow

Traditional rate-making workflow

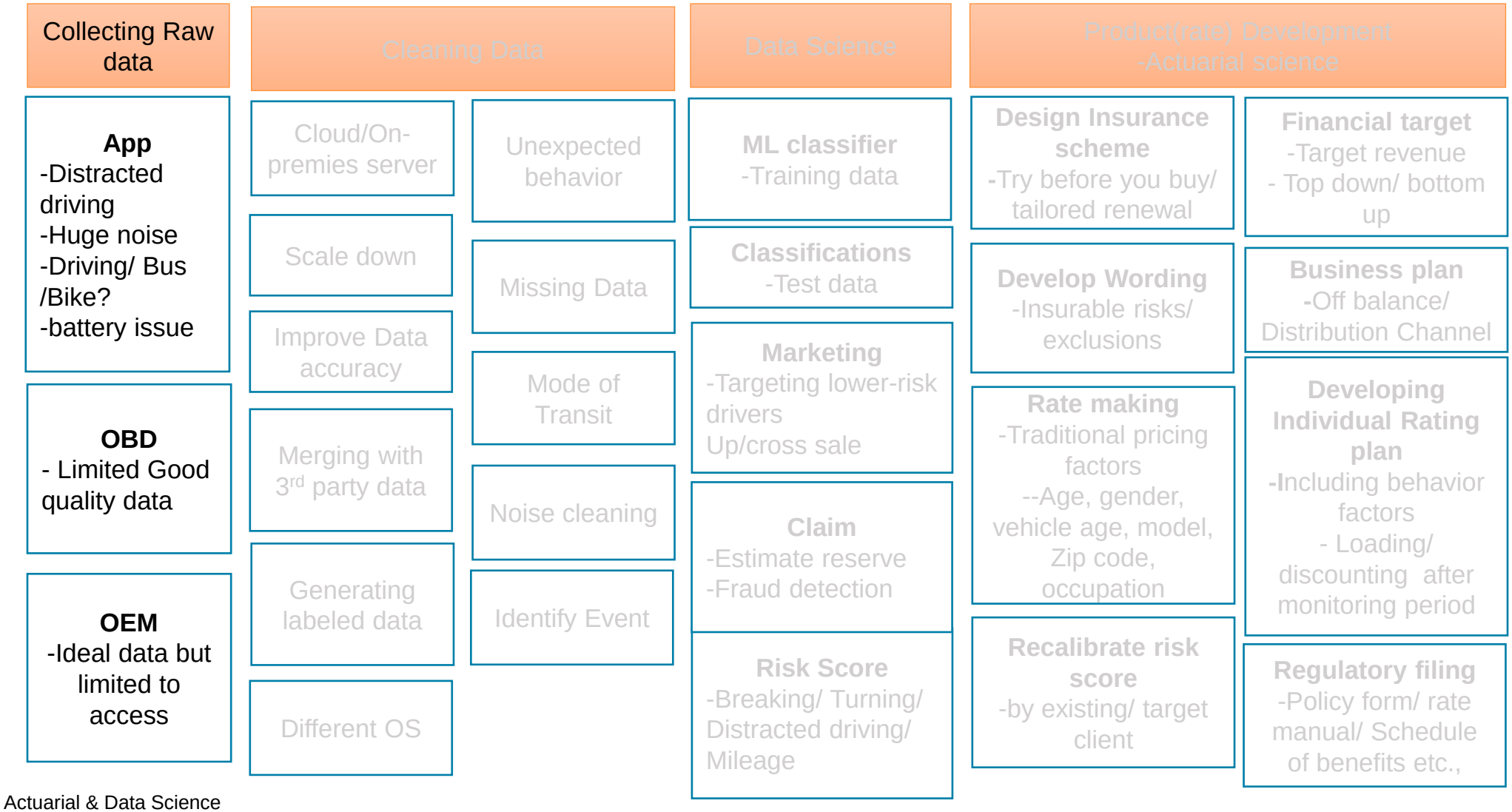
Traditional ratemaking uses predefined rating factors(exposure) such as revenue, building material, ages etc., and predefined actuarial model or curves



3. Rate-making workflow using ML/DL

Product Development workflow – telematics motor case

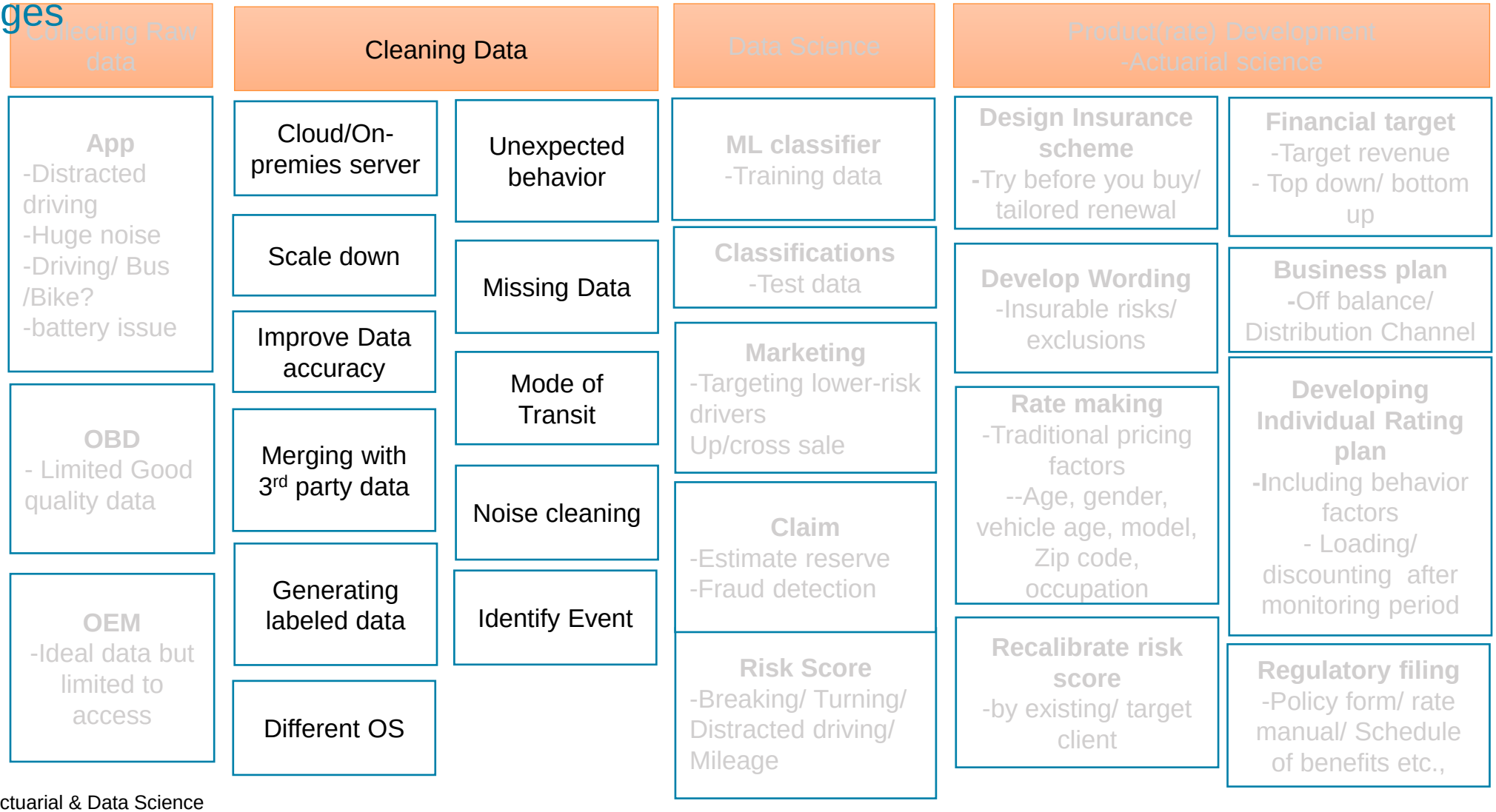
Telematics uses structure + unstructured data from various data sources



SCOR The Art & Science of Risk

Product Development workflow – telematics motor case

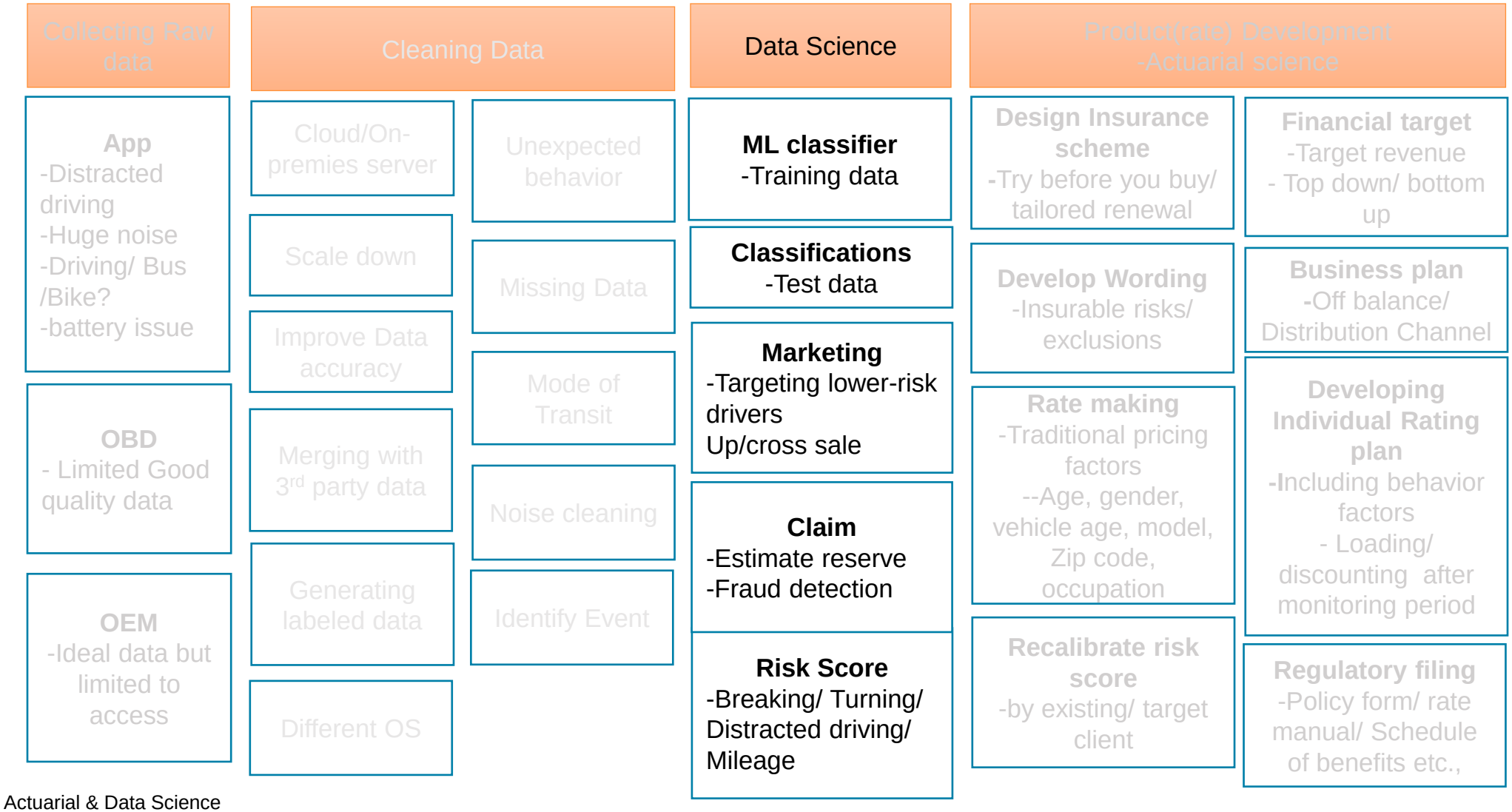
Special care is need for unstructured data handling because data cleansing can lead huge result changes



SCOR The Art & Science of Risk

Product Development workflow – telematics motor case

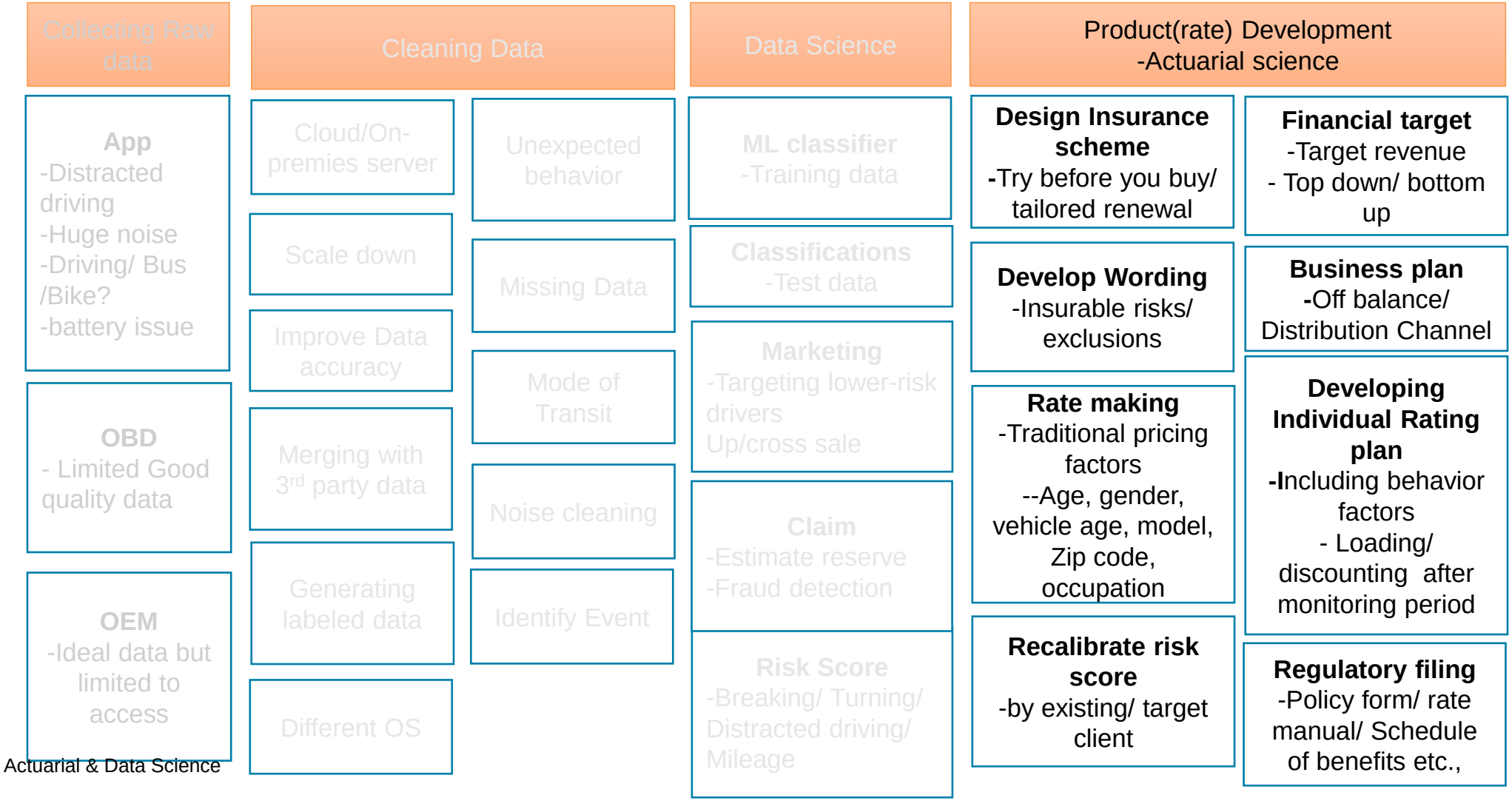
Model selection and define error by different usages is new feature in data science-based rate-making



SCOR The Art & Science of Risk

Product Development workflow – telematics motor case

Intersection between ML rating and existing actuarial factors can be existed. We have to think about whether is exist and how to avoid it.



Product Development workflow – telematics motor case

Based on product type, we may need develop individual rate. Manual rates of group risk will be adjusted by individual behavior assessment. Schedule rate will also be affected by data science rate making

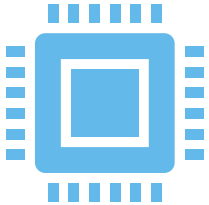
- Usage based product(Mileage-based)
  - ✓ Discount or loading based on usage
- Tailored renewal
  - ✓ Upfront discount and potential discount/loading at renewal based on driving behavior
- Pay how you drive
  - ✓ Upfront discount and cashback based on driving behavior
- Cash back insurance
  - ✓ Pay cashback at the end of policy period based on driving behavior and loss history
- Try-before-you-buy
  - ✓ A couple of week monitoring and then decide premium based on driving behavior

4. Consideration

4. Consideration

Why we used manual or schedule rate so far

The essential reason that most risks must be rated on the basis of broad group averages is that alone each risk is so small that its individual experience lacks the credibility or actuarial reliability essential to a sound rate structure.



Now a day, we can utilize huge alternative data and have computing power to analyze it.

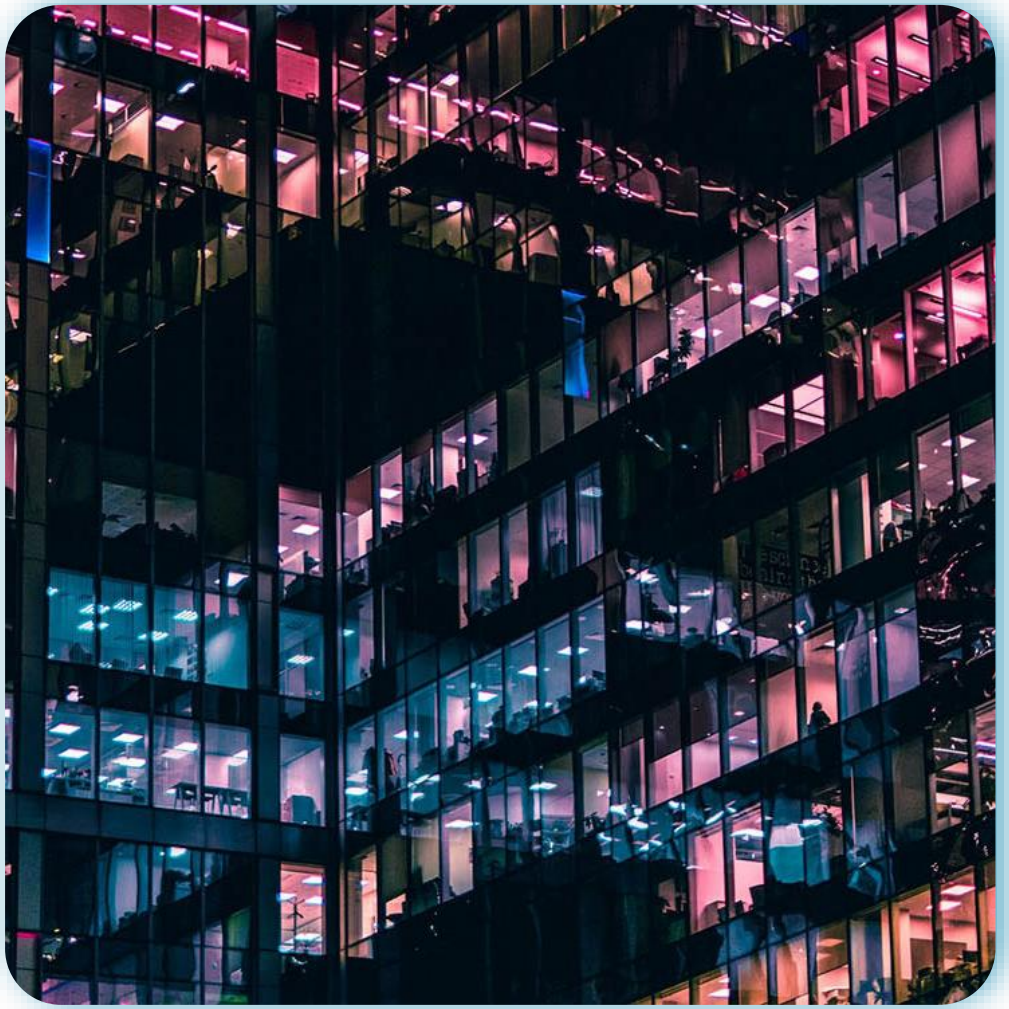
Unstructured data, such as video, audio, or image files, is new data source of rate-making.

In house or Cloud basis computing power

Actuaries have in depth knowledge on time-series analysis however we have to develop our knowledge on classification analysis and combined forecasting

The need of using individual rate is increasing, The core differentiate of induvial rate starts from well classified rate factors

And the need of classification and prediction combined modeling or forecasting is necessary



Thank You

SCOR
The Art & Science of Risk