

**Seminar Name: 15th Seminar on Current Issues
in Life Assurance (CILA)**

Venue: Hotel Sea Princess, Mumbai

Date: 20-12-2019

HOW AI IS CHANGING THE WORLD OF INSURANCE

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WHY AI?

CHALLENGES FACED BY INSURERS

Tapping into potential customers ***at the right time***

Reduce ***fraud***

Providing the ***right set of products/services*** that meet customer requirements

Giving customers a ***hassle-free claim experience***

AI helps re-define ***Customer Experience***

WHAT IS AI?

Neural networks

Self driving vehicles

Deep learning

Robotics

Machine Learning

Computer vision

Expert systems

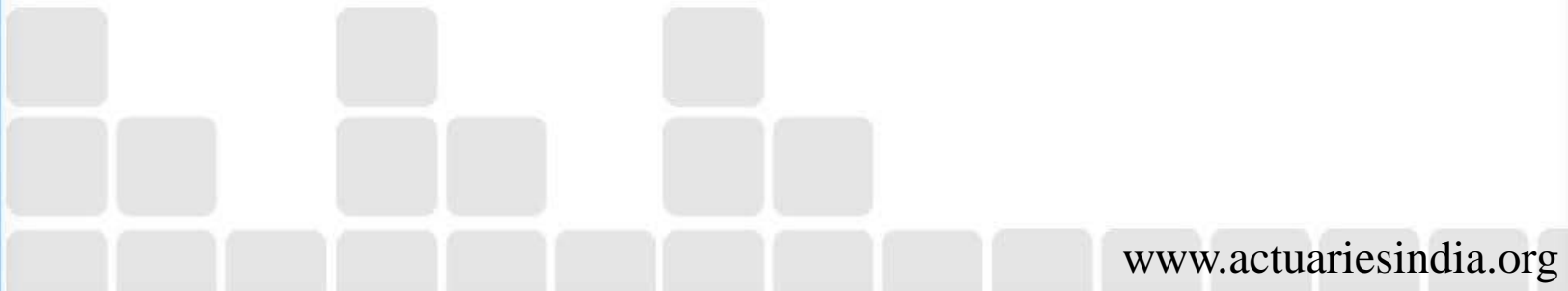
Natural language processing

Fuzzy logic



WHAT IS ARTIFICIAL INTELLIGENCE?

THE THEORY AND DEVELOPMENT OF COMPUTER SYSTEMS
ABLE TO PERFORM TASKS NORMALLY REQUIRING HUMAN
INTELLIGENCE

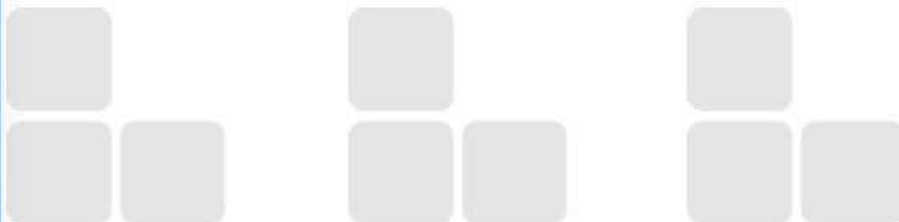


WHAT REQUIRES HUMAN INTELLIGENCE

$$\left(78829 \div \frac{173467 + \sqrt{2663747}}{283} \right)^{\frac{1}{3}}$$

Finding the fastest check-out line at the super market

Identifying your spouse in their school photograph



WHAT IS ARTIFICIAL INTELLIGENCE?

THE THEORY AND DEVELOPMENT OF COMPUTER SYSTEMS ABLE TO PERFORM TASKS NORMALLY REQUIRING HUMAN INTELLIGENCE, SUCH AS VISUAL PERCEPTION, LEARNING FROM EXPERIENCE, DECISION-MAKING, AND UNDERSTANDING HUMAN LANGUAGES.

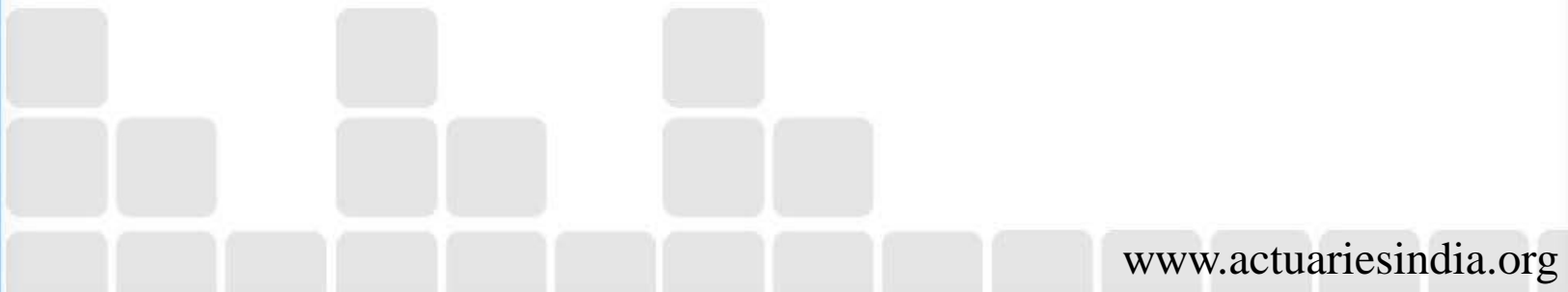
VISUAL PERCEPTION

ABILITY TO COMPREHEND IMAGES AND VIDEOS

IDENTIFYING OBJECTS

DETECTING MOVEMENT

GETTING A 3-D UNDERSTANDING OF THE ENVIRONMENT

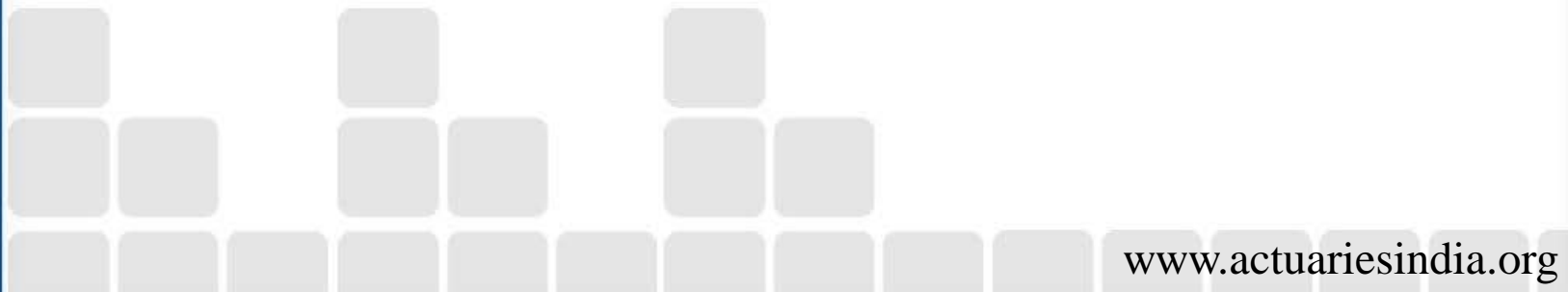


LEARNING FROM EXPERIENCE

LEARNING FROM HISTORICAL INFORMATION (DATA)

ABILITY TO ADAPT TO CHANGES IN ENVIRONMENT

ABILITY TO GENERALIZE

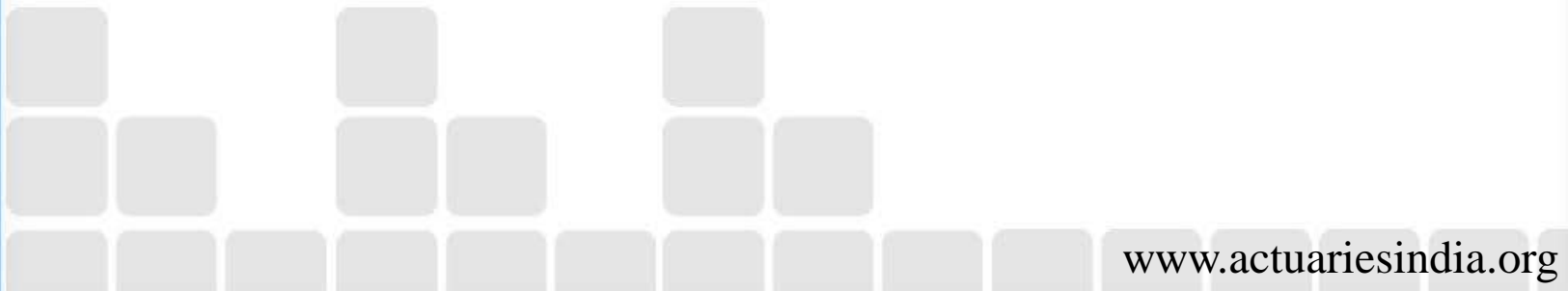


DECISION MAKING

ABILITY TO USE EXISTING EXPERT KNOWLEDGE

COMBINE WITH KNOWLEDGE FROM EXPERIENCE

RESOLVE CONFLICTING RULES



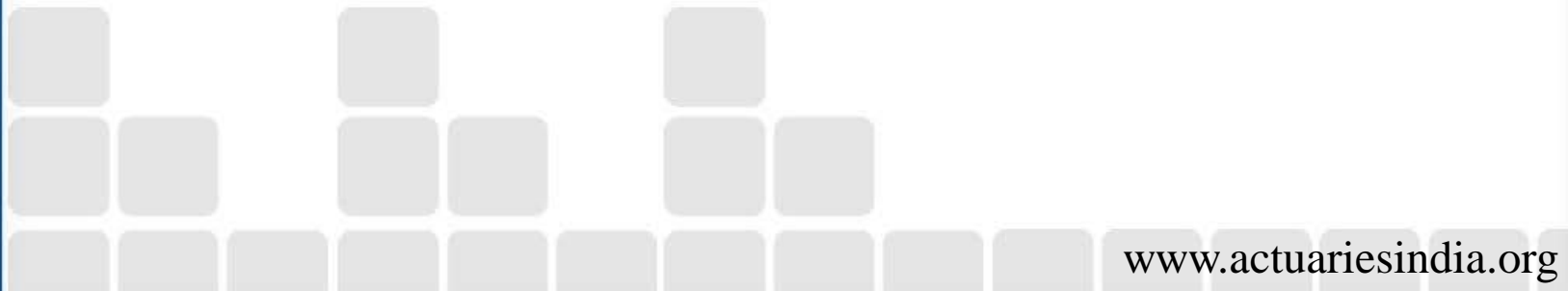
UNDERSTANDING HUMAN LANGUAGE

UNDERSTANDING WRITTEN LANGUAGE

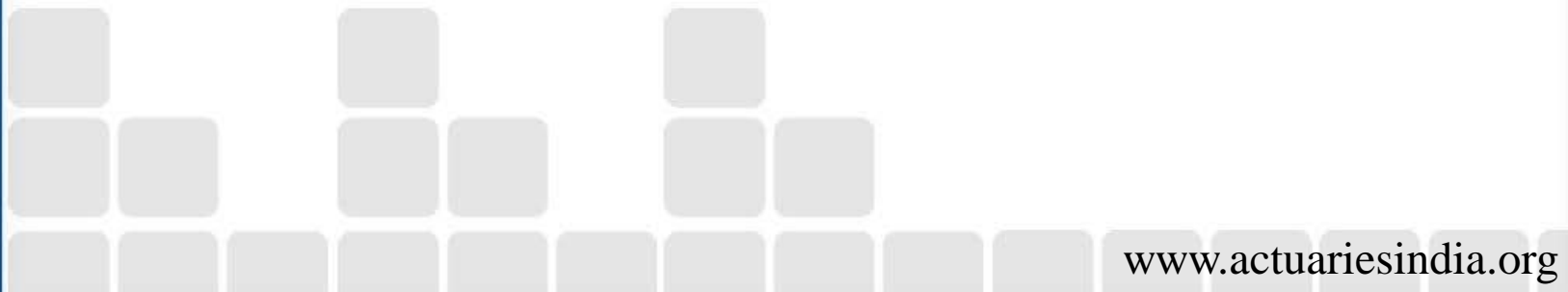
UNDERSTANDING SPEECH

RESPONDING IN HUMAN LIKE LANGUAGE

RESPONDING IN HUMAN LIKE SPEECH



AI IN INSURANCE



WHAT'S IN A SELFIE?

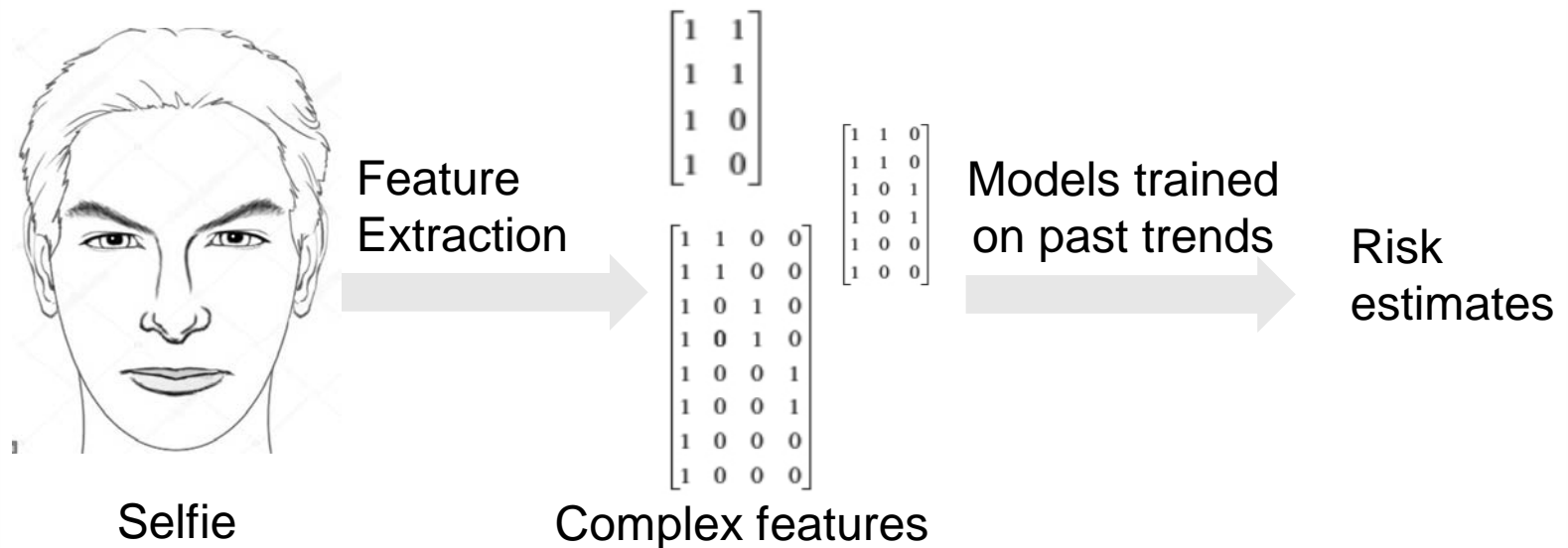


New facial analysis technology helps find indication of:

- BMI
- Age
- Gender
- Smoking

Useful for better underwriting of life insurance policies.

HOW DOES IT WORK?



LEGAL & GENERAL AMERICA

Other applications of image and video analysis

Automatic analysis of accident pictures for faster claim processing

Analyzing Geo-Spatial imagery for better estimates of property and home insurance premiums

Real time analysis of driver behavior for road safety

ALLSTATE

**AGRICULTURAL INSURANCE
COMPANY OF INDIA**

LIBERTY MUTUAL

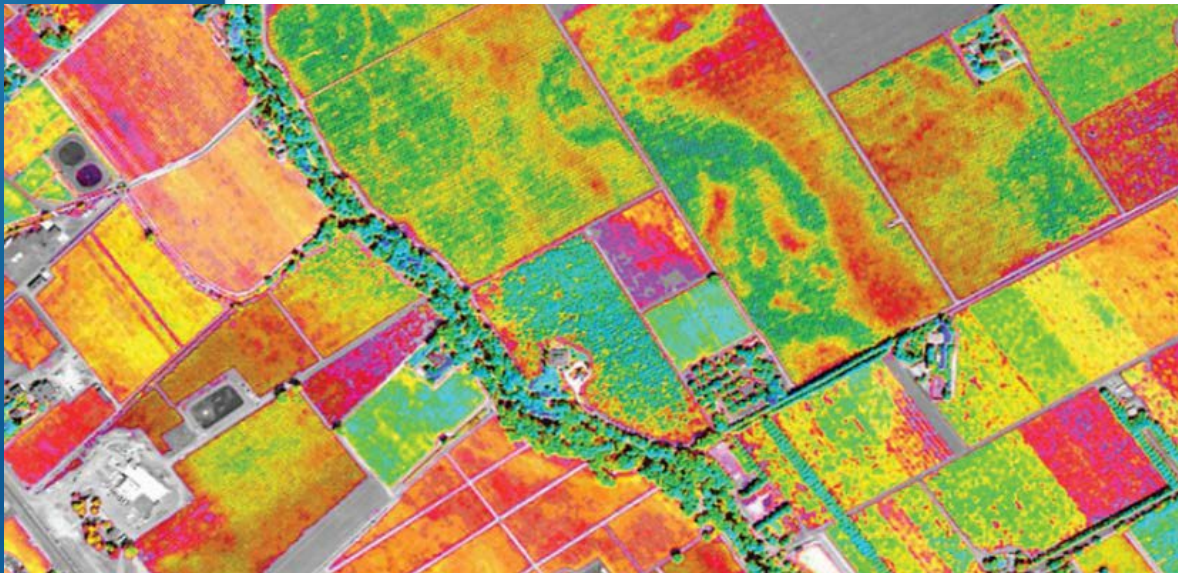
REAL-TIME CAR DAMAGE ASSESSMENT



Tractable technology uses image recognition technology for automated damage analysis.

The technology is expected to shorten the process for assessor to visit, inspect and evaluate the expenses for the damaged car - **significantly from weeks to one day.**

SATELLITE IMAGES FOR AGRICULTURAL INSURANCE PRICING



The use of satellite images helps to survey and monitor a large agricultural area day and night.

The satellite images allow insurers to receive real-time updates of potential perils in the fields. The data from the images, with the boundary of the insured, will help insurance to price risks more accurately, increase efficiencies and lower operating costs

USE DRONES TO TAKE PHOTOS OF HOUSE ROOFS



The use of drones in the Property & Casualty insurance will soon become the standard procedure for quoting, inspection and damage assessment.

A drone can take hundreds of images in 10 to 20 minutes for quoting purpose. The use of drones provides speed and service.

RISK MODELING WITH IMAGE DATA

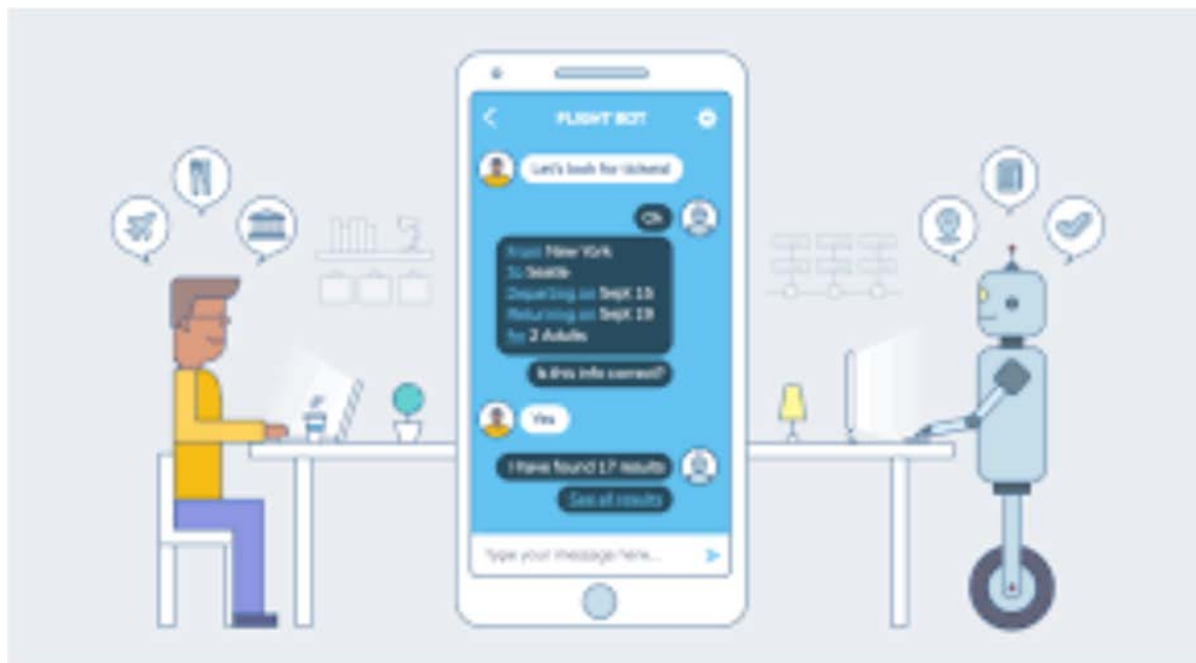
A fraud model can be enhanced by the image score to identify a false account and transaction.



Facebook can identify 98% of its images to the right person.

Facebook uses its imaging technology to identify and remove fake accounts. Such image-based fake-identification has immense potential in banking and insurance. There is numerous potential in using the image data for fraud identification.

LOOK WHO'S TALKING?



Chatbots have been used successfully to achieve

- Improved customer response times
- Cost savings

HOW DOES IT WORK?

Natural language understanding

Natural language generation

ALLSTATE / ABIE

LEMONADE

CLAIMS PROCESS AUTOMATION



CASE STUDY

Allstate's Intelligent Agent Reduces Call Center Traffic and Provides Help During Quoting Process

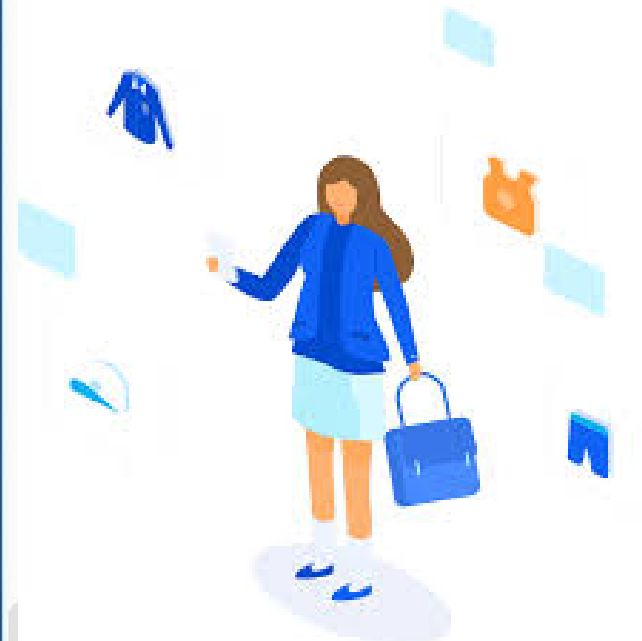
The Allstate Corporation is the nation's largest publicly held personal lines insurer, protecting approximately 16 million households from life's uncertainties through auto, home, life and other insurance offered through its Allstate,

Esurance, Encompass and Answer Financial brand names. Allstate is widely known through the slogan "You're In Good Hands With Allstate®." The Allstate brand's network of small businesses offers auto, home, life and retirement products and services to customers in the United States and Canada. In the 20 years since Allstate became a fully independent public company, The Allstate Foundation, Allstate, its employees and agency owners have donated more than \$405 million to support local communities. Earley Information Science (EIS) worked with Allstate Business Insurance, which provides insurance products for commercial vehicles, properties, and liability exposures.



Allstate Business Insurance has also recently developed ABLe in partnership with EIS. **ABLe (spoken as Abbie) is an AI-based virtual assistant application designed** to cater to Allstate insurance agents looking for information on ABI's commercial insurance products.

RECOMMENDING THE CORRECT PRODUCT



- Product recommendation models are getting more and more popular.
- They improve lead conversion.
- The customer benefits from an unbiased recommendation and is likely to be more persistent.

HOW DOES IT WORK?

Matching customer profile with available choices

Customized coverage as per customer needs

Predicting purchase propensity

Right time to offer

External data can be very useful.

INSURIFY

INSHUR

CLEARCOVER

PREDICTIVE MODELS

Prediction is difficult,

Especially so when it is about the future !

IMPROVED LEAD CONVERSION

FRAUD PREVENTION

FASTER CLAIM PROCESSING

IMPROVING SPEED OF POLICY ISSUANCE

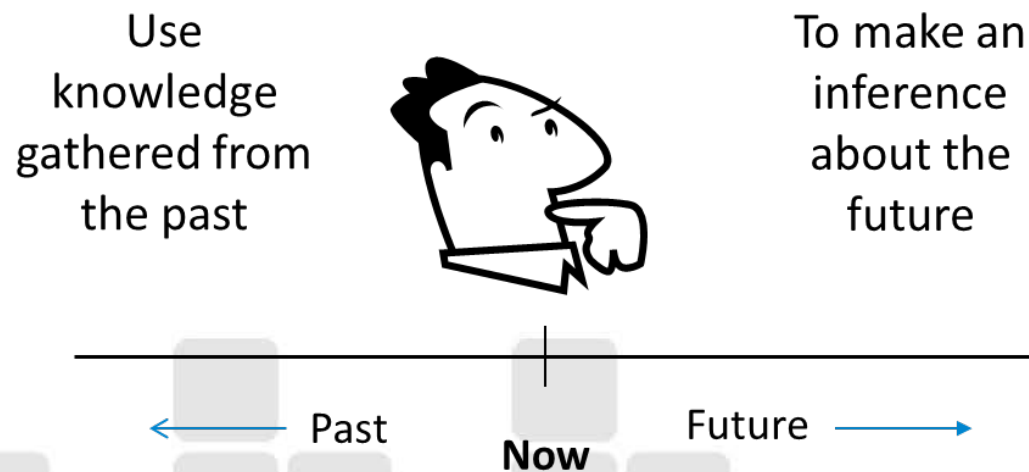
IMPROVING PREMIUM COLLECTION

IMPROVED CROSS-SELL

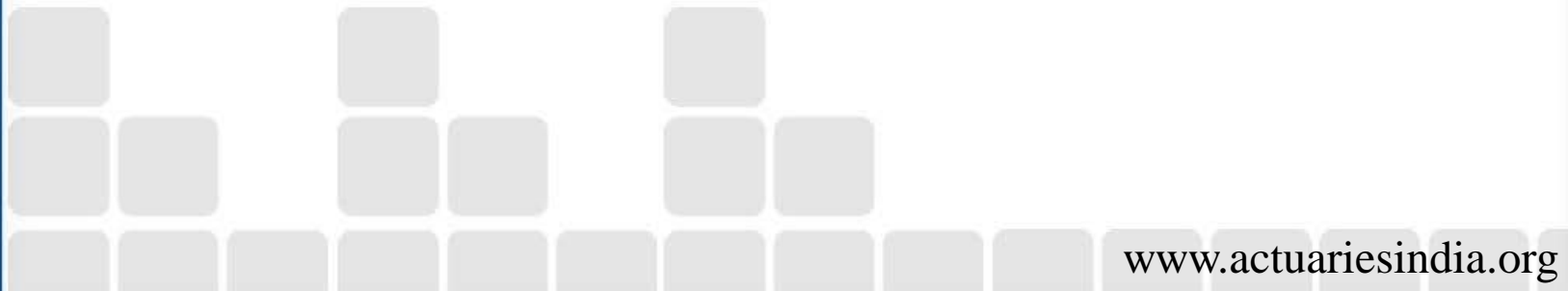
HOW DOES IT WORK?

Machine learning algorithms

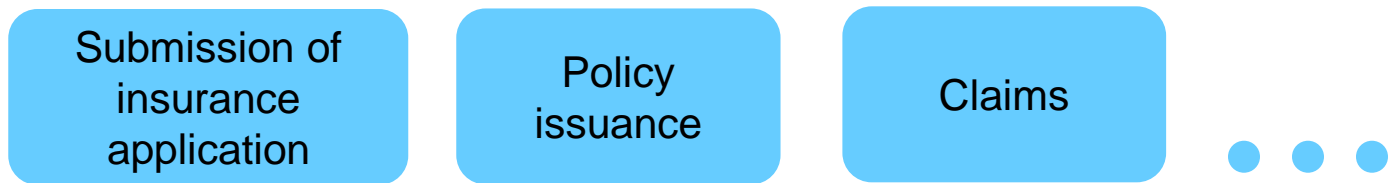
Learning repeating patterns from historical data



CASE STUDY: PREDICTING THE RISK OF AN EARLY CLAIM



OVERALL PICTURE



Insurer systems

Cloud

Real time request : sent for every submitted proposal

Real time response : Prediction of early claim risk

End of day data feed to update metrics used by model

Request for scoring a proposal includes information about that proposal, such as premium, sum assured, etc

Predictive model for identifying the risk of early claims

Model data

Scored response by the predictive model generally includes a numerical score, a category label (such as RAG) and a list of influencers (detail about how variables affect the prediction)

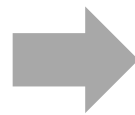
PREDICTIVE PROBLEM DEFINITION

Predict the risk of a early claim – claim within 3 years of issuance.

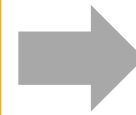
Prediction at proposal submission

Universe for prediction : All submitted proposals

Data available
at the time of
policy
issuance



Predictive
model

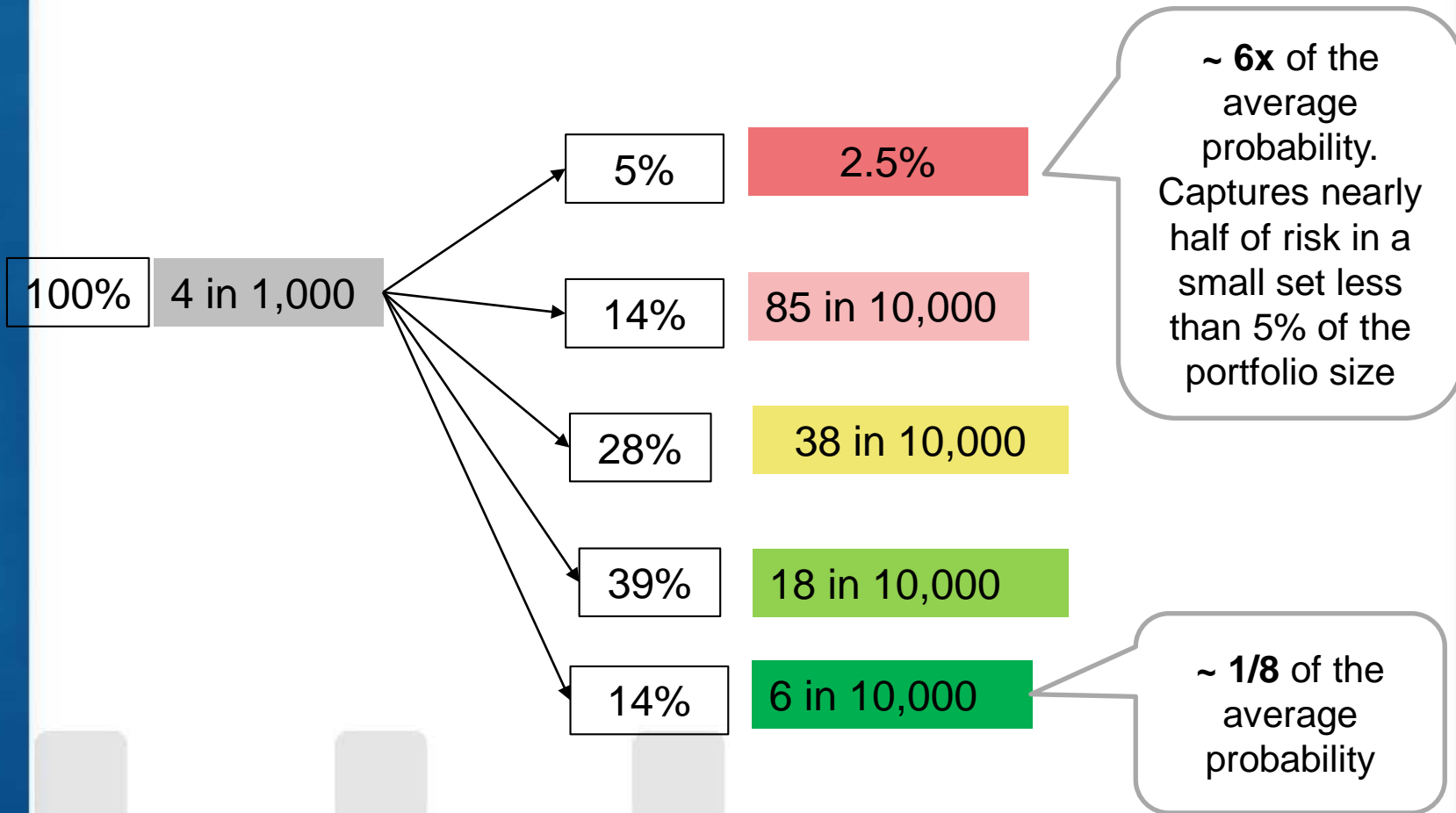


Red – High risk policies

Amber – Medium risk
policies

Green – Low risk
policies

RESULTS



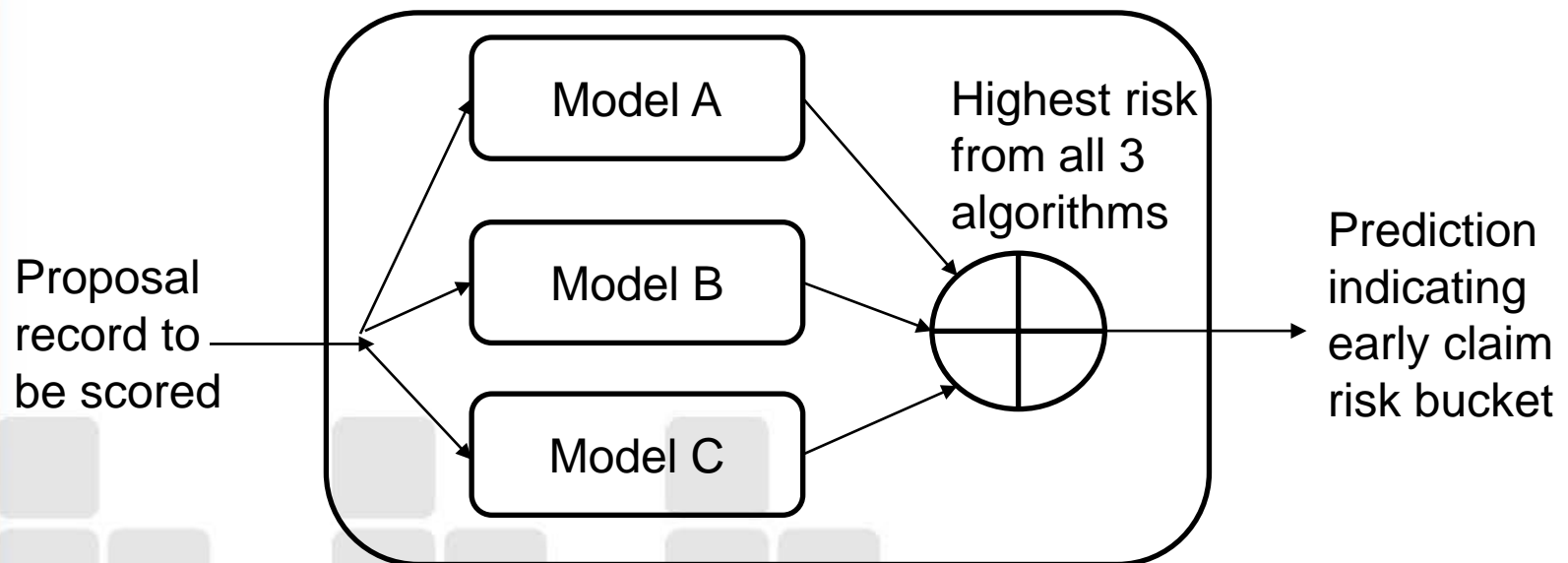
HOW WAS THE MODEL CREATED ?

A composite model created by combining 3 different models:

Model 1: Uses Random Forest algorithm

Model 2: Uses Gradient Boosting algorithm

Model 3: Uses a neural network

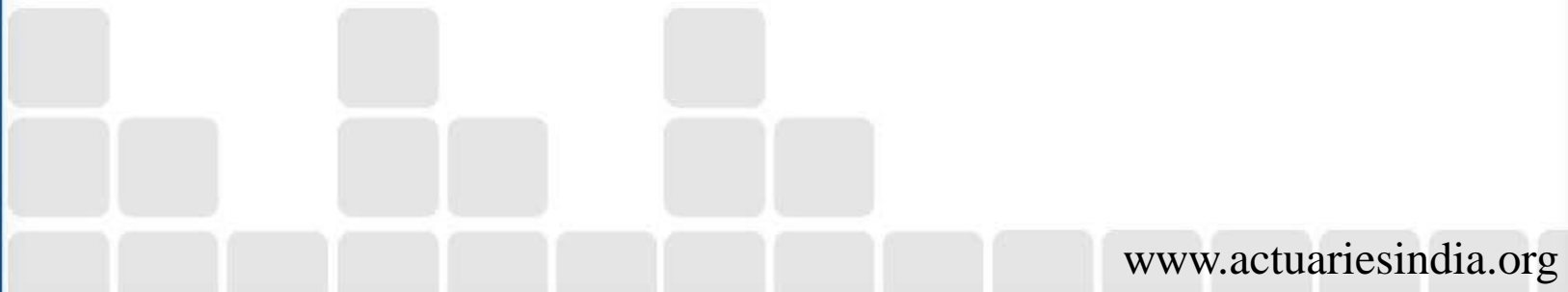


SIGNIFICANT PREDICTORS

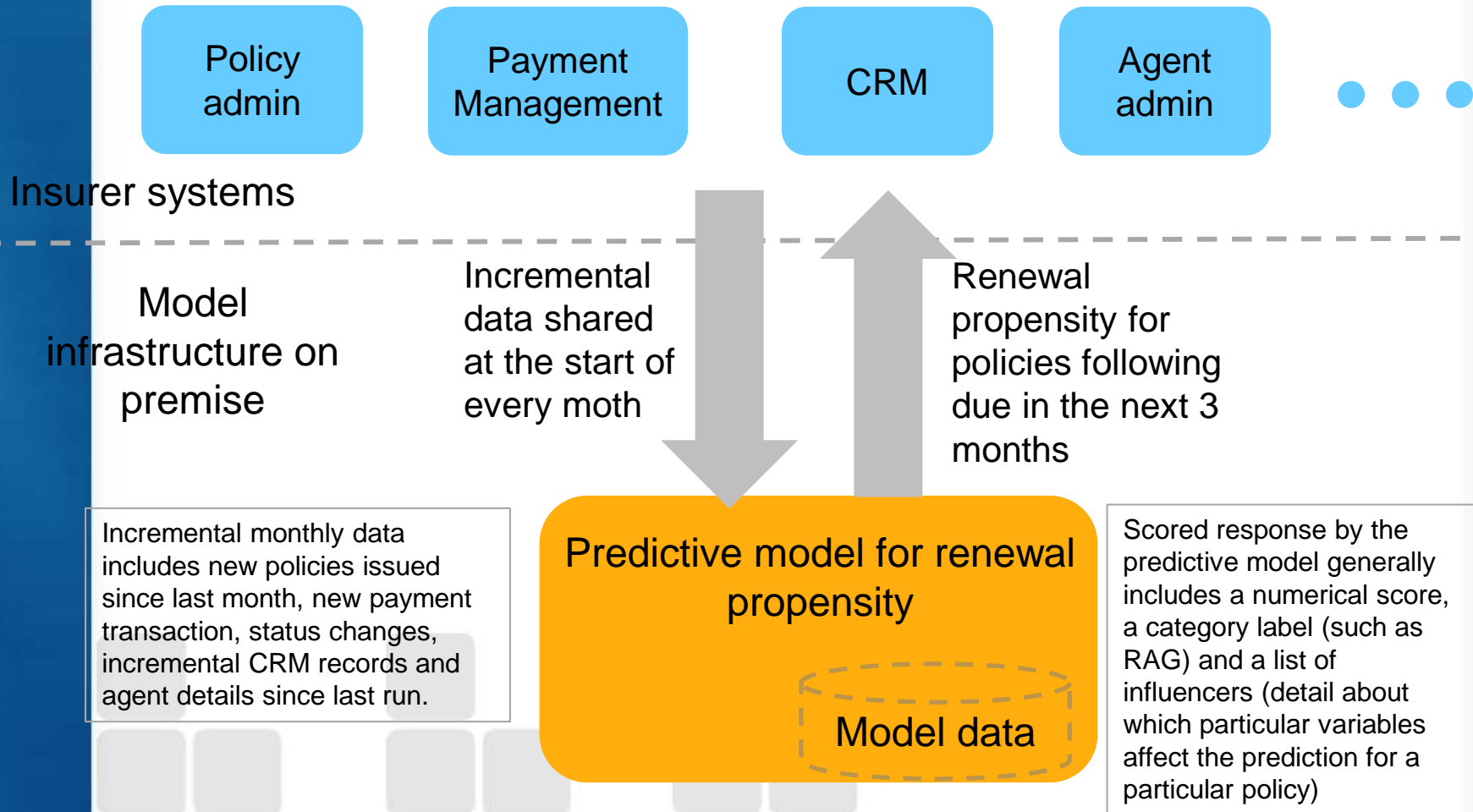
1. Age of Customer as on Submission Date
2. Product Category
3. Ratio of Premium Paying Term to Benefit Term
4. Agent's Claims to policies Issued Ratio
5. Marital Status of Customer

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CASE STUDY: PREDICTING RENEWAL PROPENSITY



OVERALL PICTURE

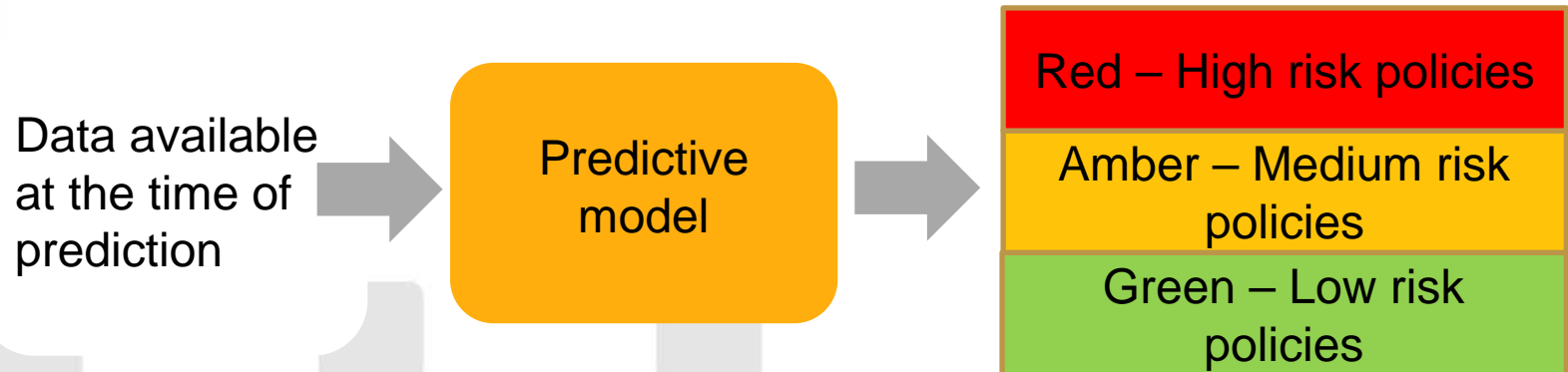


PREDICTIVE PROBLEM DEFINITION

Predict whether a given policy (which is nearing its due date) will pay the premium *before the end of its grace period*.

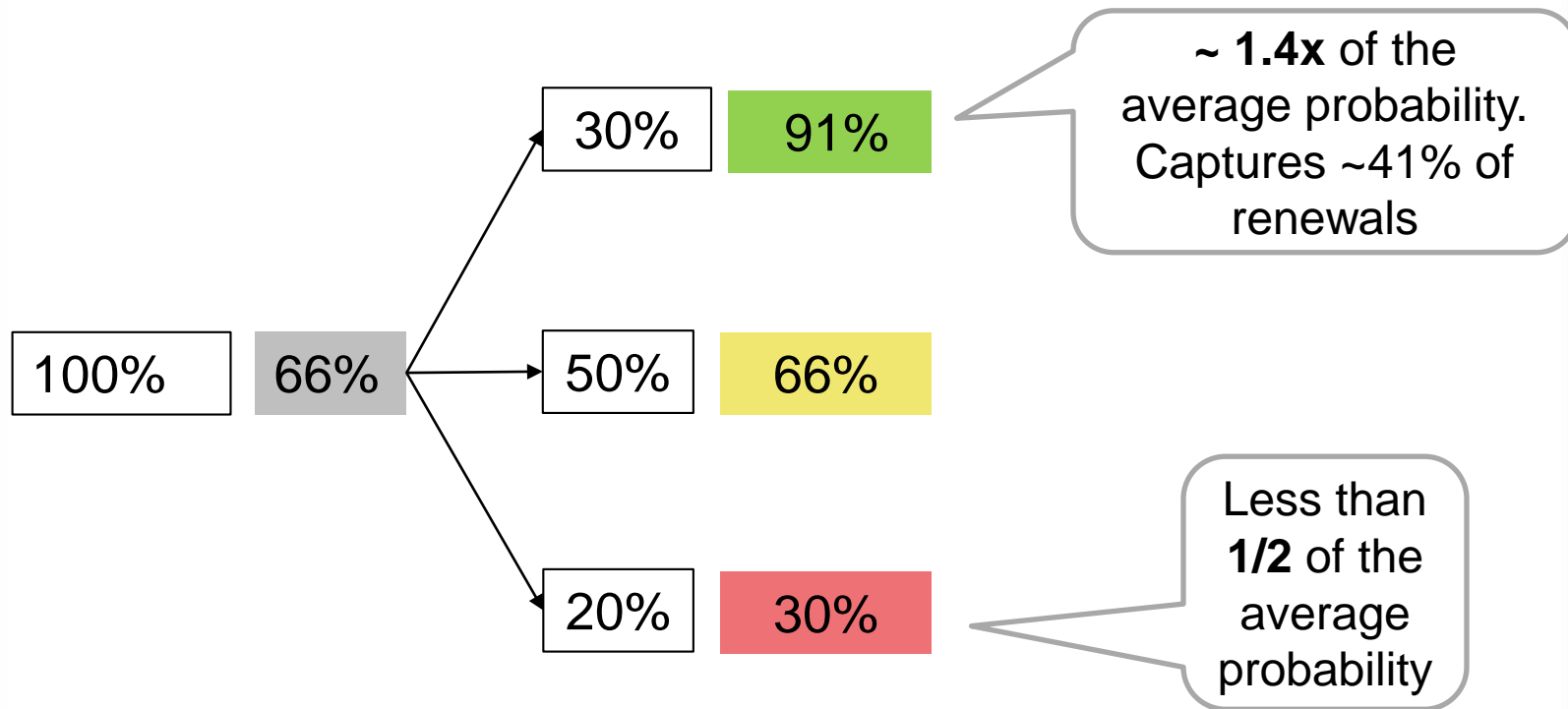
Prediction is done periodically – at the start of every month

Universe for prediction : All non-monthly policies*



*Note: A separate model was created for policies with monthly payment frequency.

RESULTS



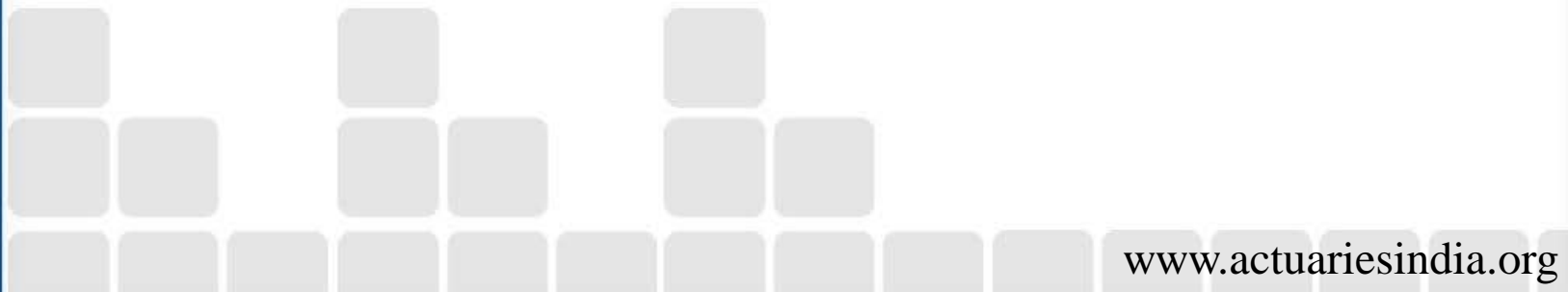
Note: This is a supervised ML model created using **G**radient **B**oosting **M**achine algorithm.

SIGNIFICANT PREDICTORS

1. Time of last payment
 2. Did the policy ever miss it's payment date in the past?
 3. Historical in-force ratio for the product
 4. State
 5. Vintage
- ...



INDUSTRY TRENDS



SIGNIFICANT PREDICTORS

WITH ONLY **1.3%** OF INSURANCE COMPANIES INVESTING IN AI COMPARED TO **32%** IN SOFTWARE AND INTERNET TECHNOLOGIES, THE INSURANCE INDUSTRY IS STILL LAGGING BEHIND IN THE AI MOVEMENT.

THE VALUE OF GLOBAL INSURANCE PREMIUMS UNDERWRITTEN BY ARTIFICIAL INTELLIGENCE WILL EXCEED **\$20 BILLION BY 2024**, UP FROM AN ESTIMATED **\$1.3 BILLION IN 2019**.

INSURANCE INDUSTRY COST SAVINGS FROM AI WILL GROW FROM **\$340 MILLION IN 2019** TO **\$2.3 BILLION BY 2024**.

Source: Juniper research



**ANY
QUESTIONS?**





THANKS!
AUREUS

Dr. Nilesh N. Karnik
Chief Data Scientist

