

Presentation to Actuarial Society of Malaysia  
21<sup>st</sup> November 2017  
Annual Dinner + Seminar  
“Who Wants to be a Data Scientist?”

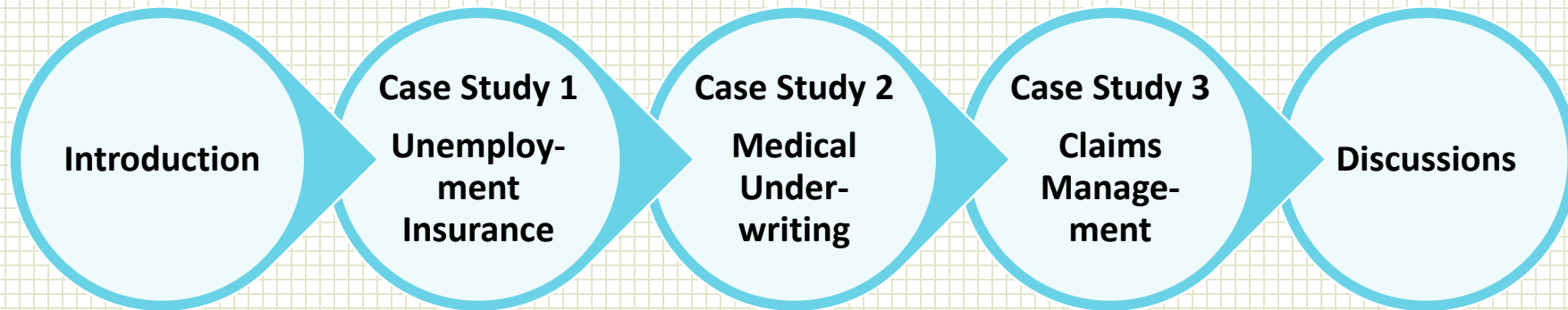
# Data Analytics Case Studies

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# Background

This is a presentation to the Actuarial Society of Malaysia prepared by Nicholas Actuarial Solutions. The objective of this presentation is to share our experience in actual applications of data analytics into insurance business to create value.

The contents of this presentation are as follows:



# Introduction



# Case Study 1

## Unemployment Claims

Insurer specialising in payment protection insurance

≈25% of portfolio (in terms of GWP) is involuntary unemployment cover

Covers monthly repayment for underlying finance for up to 12 months following redundancy

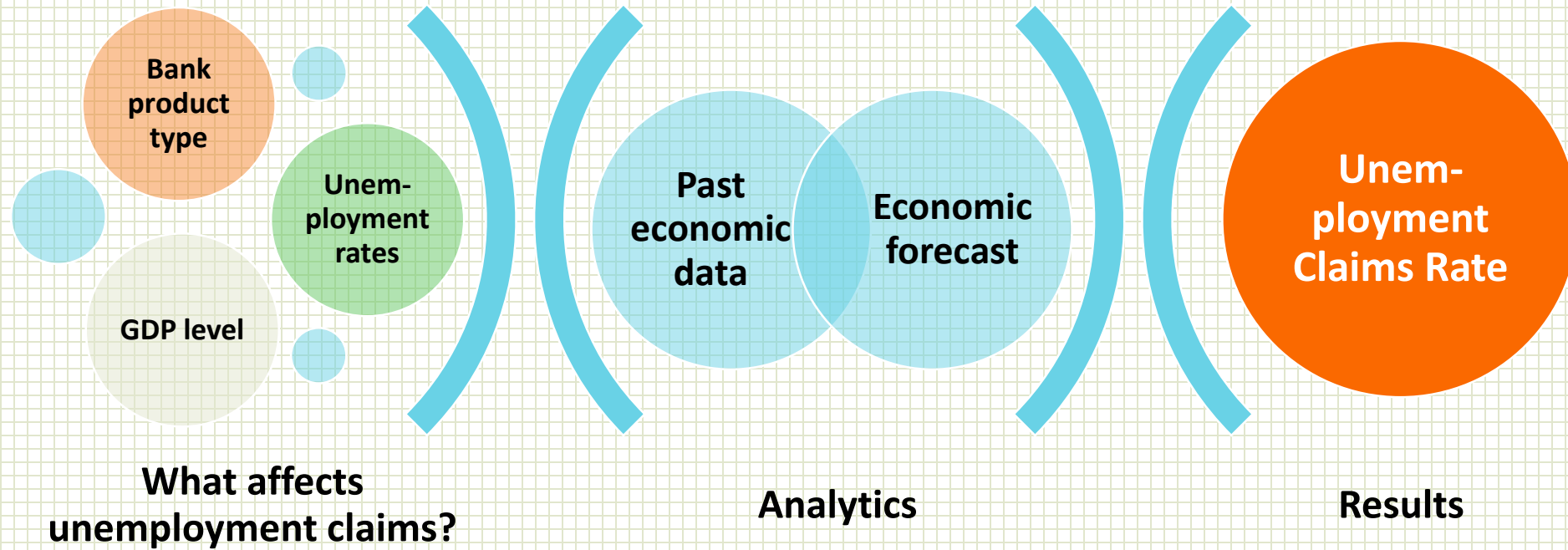
Tied to house mortgage, car loan, commercial loan, credit card, personal finance or overdraft

## Case Study 1 Unemployment Claims

### **Problem statement:**

**Prospective unemployment claims has little correlation with historical unemployment claims.**

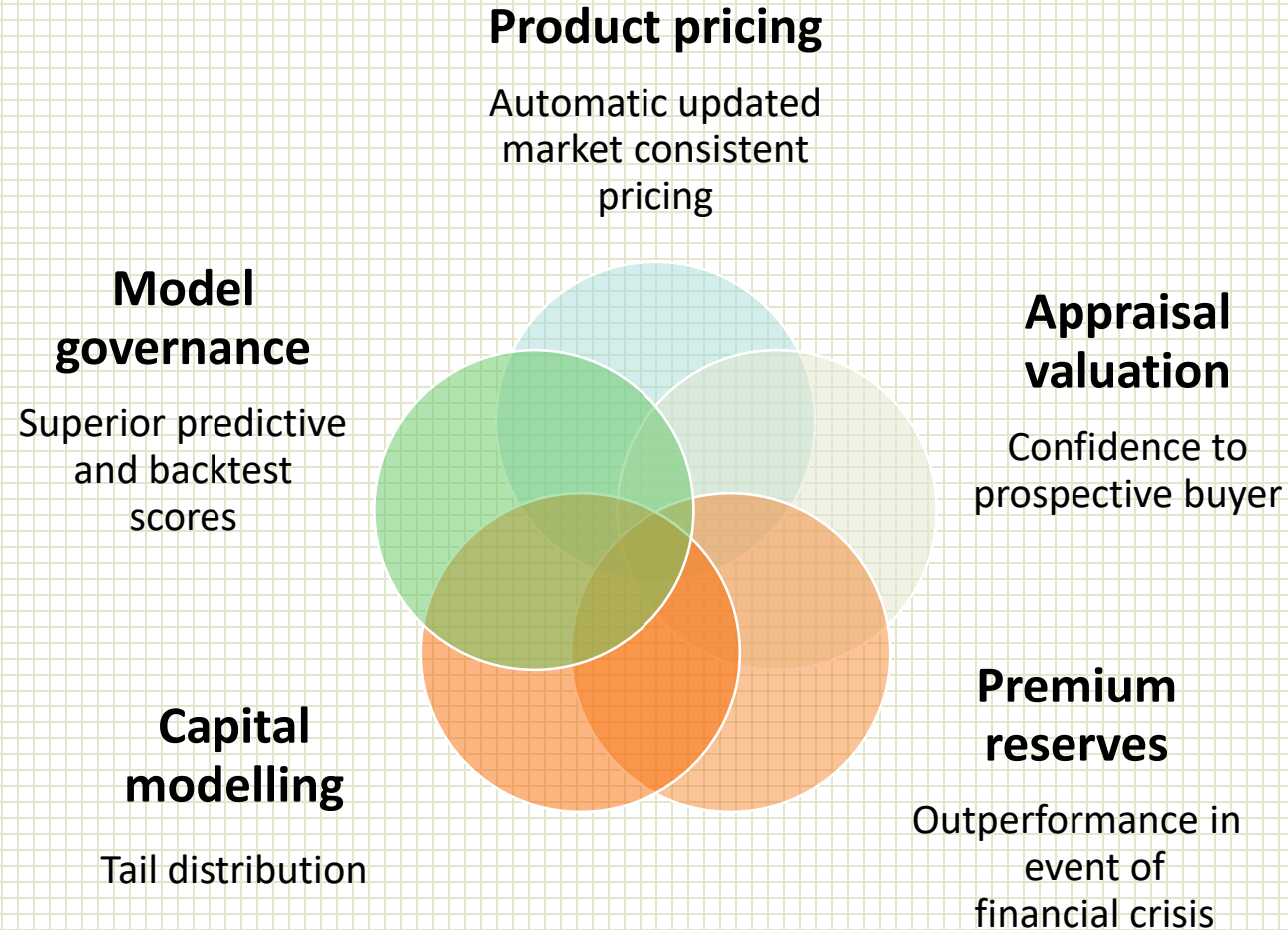
# Model Structure



## Sample Model Results (For Illustration Purpose Only)

Country	Bank Product	GDP Forecast (USD trillion)	Unemployment Forecast	Best Estimate Unemployment Claims Rate	95% Confidence Level
A	House Mortgage	3.5	4.2%	0.13%	[0.12%, 0.14%]
A	Car Loan	3.5	4.2%	0.15%	[0.12%, 0.18%]
A	Personal Loan	3.5	4.2%	0.22%	[0.15%, 0.30%]
B	House Mortgage	0.2	20.7%	3.12%	[2.58%, 3.66%]
B	Personal Loan	0.2	20.7%	4.01%	[3.43%, 4.59%]
...	...	...	...	...	...

# Business Case





## Case Study 2 Medical Underwriting

Large bank with millions of customers and a bancassurance partnership

Sales of credit life is strong as insurance is tied to the underlying finance

Sales of non-credit related insurance is very low, mainly due to medical underwriting requirements

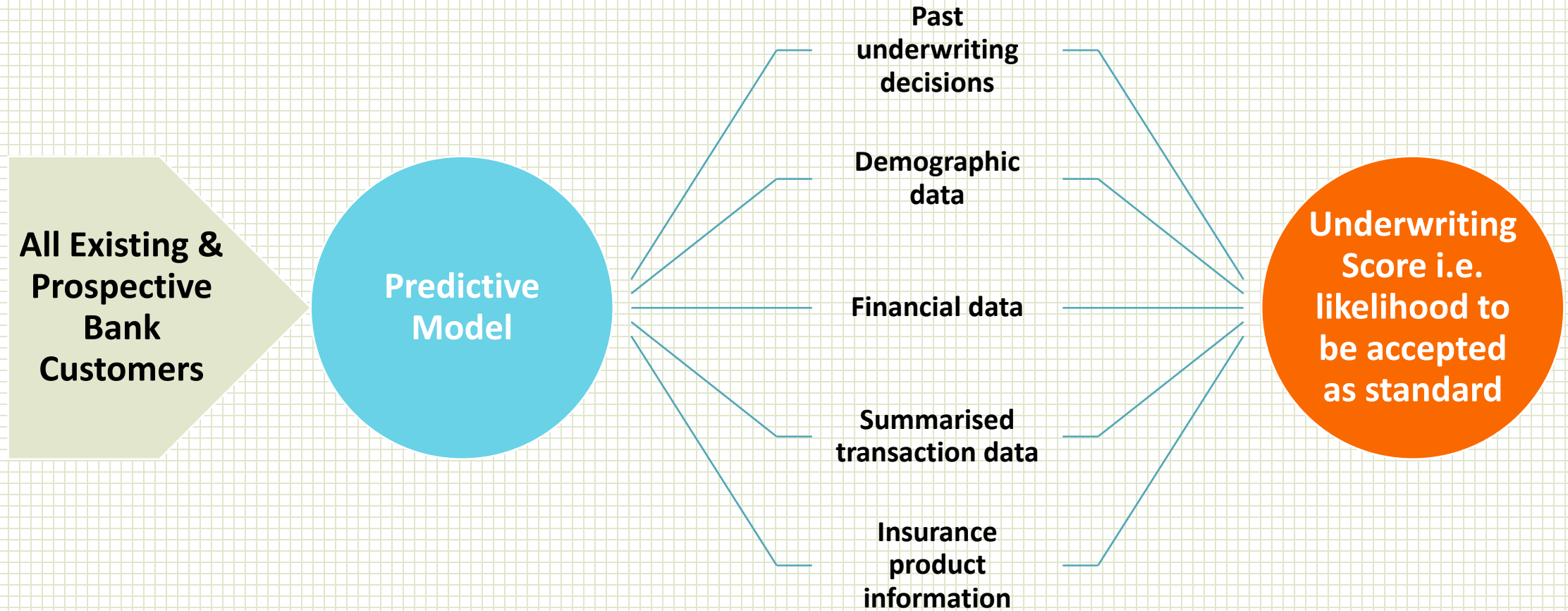
Medical underwriting requirements are tight in the market as anti-selection is prevalent

Case Study 2  
Medical Underwriting

**Problem statement:**

**Reduce medical underwriting requirements without increasing anti-selection risk.**

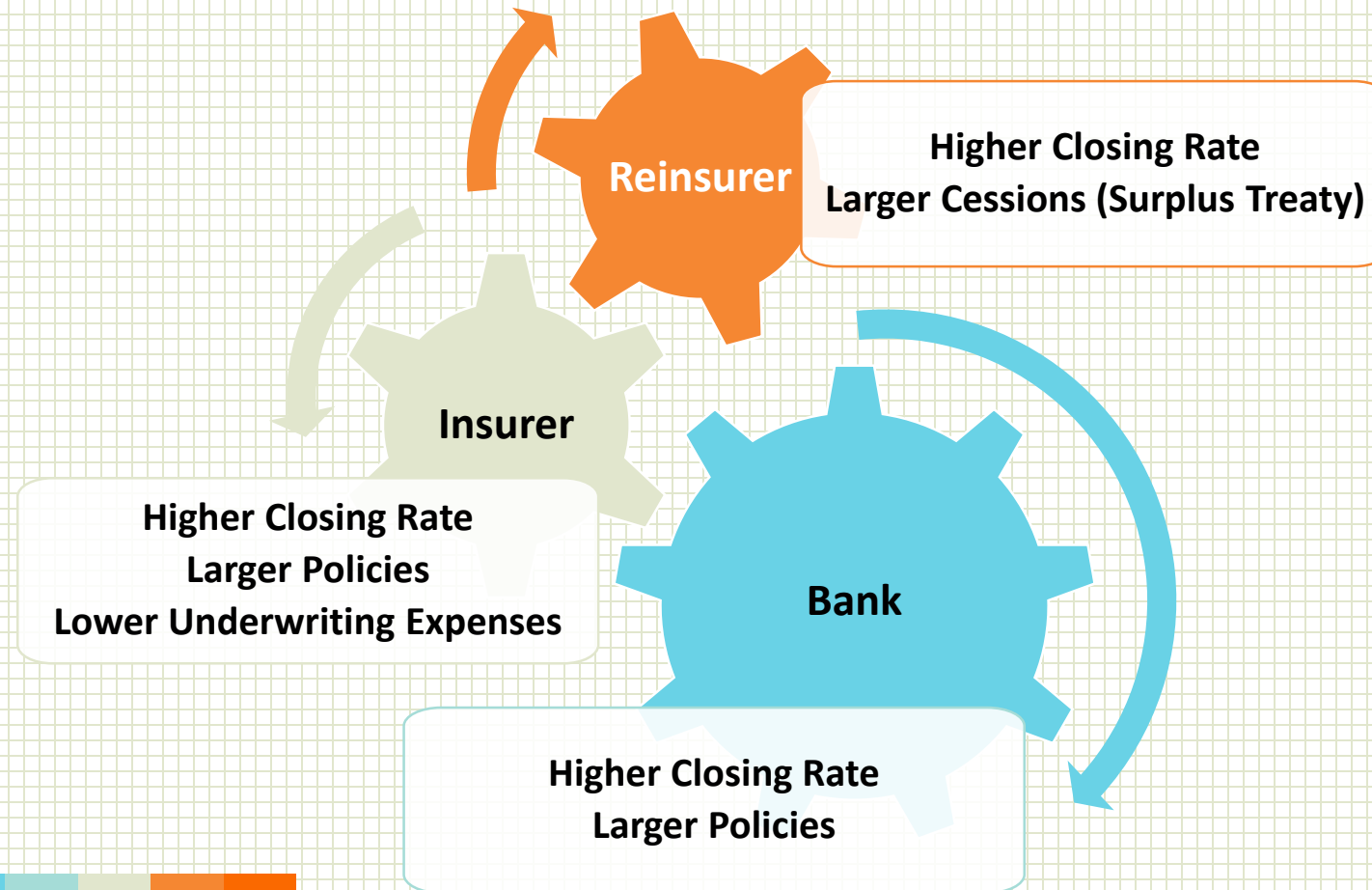
# Model Structure



## Sample Model Results (For Illustration Purpose Only)

Bank Customer	Insurance Product	Underwriting Score (likely to be rated as standard)	Underwriting Rule (with financial underwriting embedded)
A	Term Life	98%	Simplified underwriting up to \$1m sum at risk
A	Savings	98%	No underwriting up to \$100k sum at risk
B	Term Life	83%	Simplified underwriting up to \$150k sum at risk
B	Savings	83%	Simplified underwriting up to \$150k sum at risk
C	Term Life	67%	Full underwriting i.e. no change
C	Savings	67%	Simplified underwriting up to \$50k sum at risk
...	...	...	...

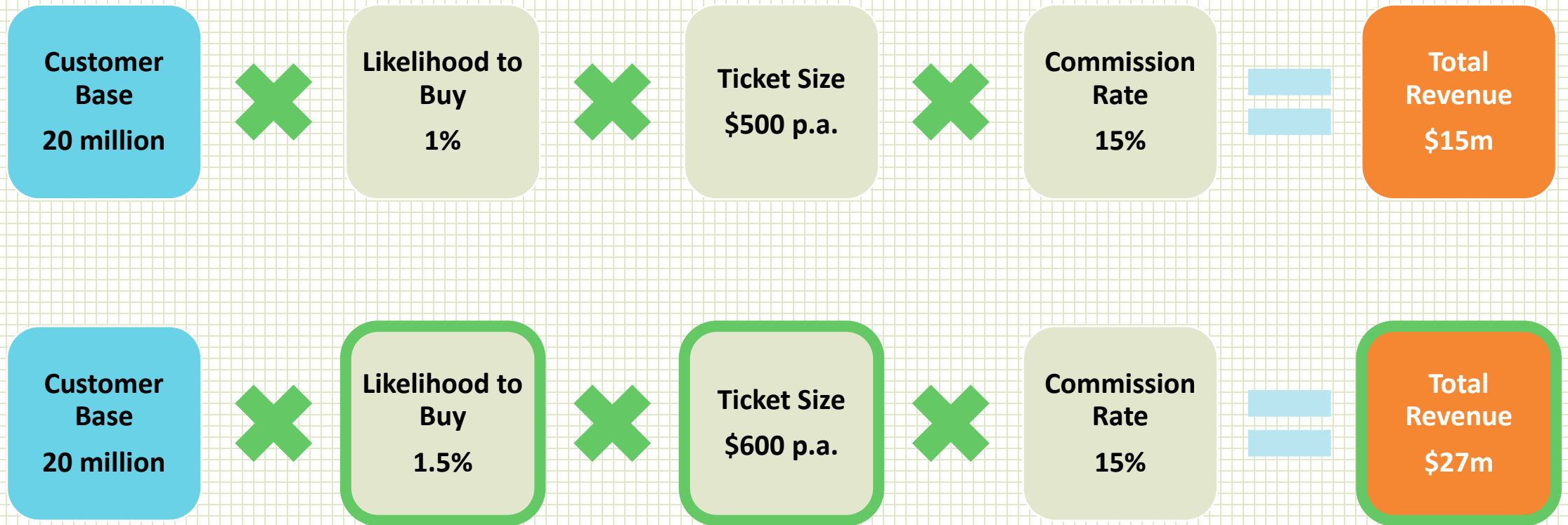
# Data Analytics Partnership



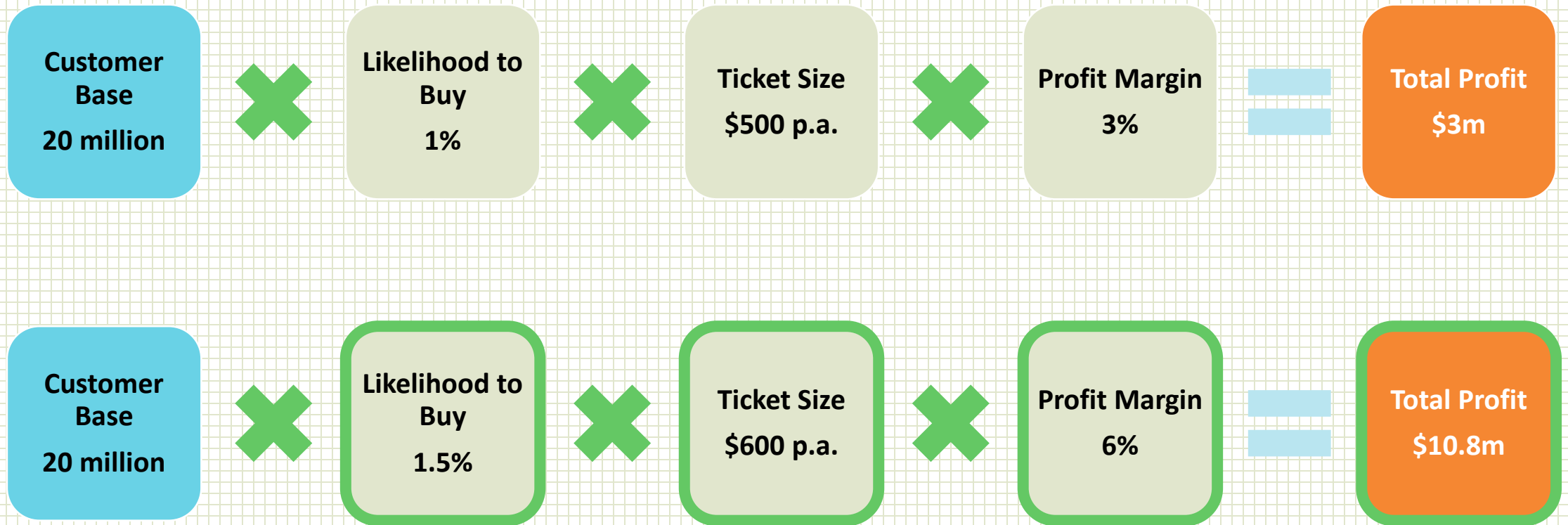
# How we look at analytics



# Business Case – Bank

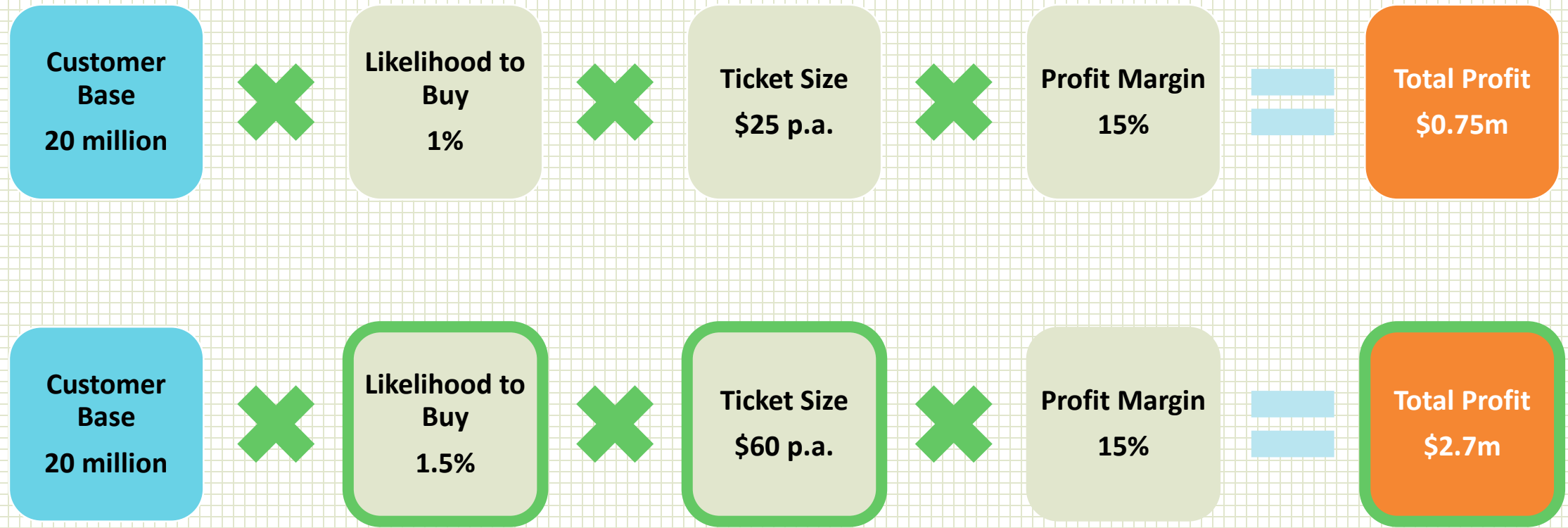


# Business Case – Insurer





# Business Case – Reinsurer



## Case Study 3 Health Insurance

Existing health schemes with varying claims experience

Prospective schemes with no knowledge of claims specific experience

Price competition is significant

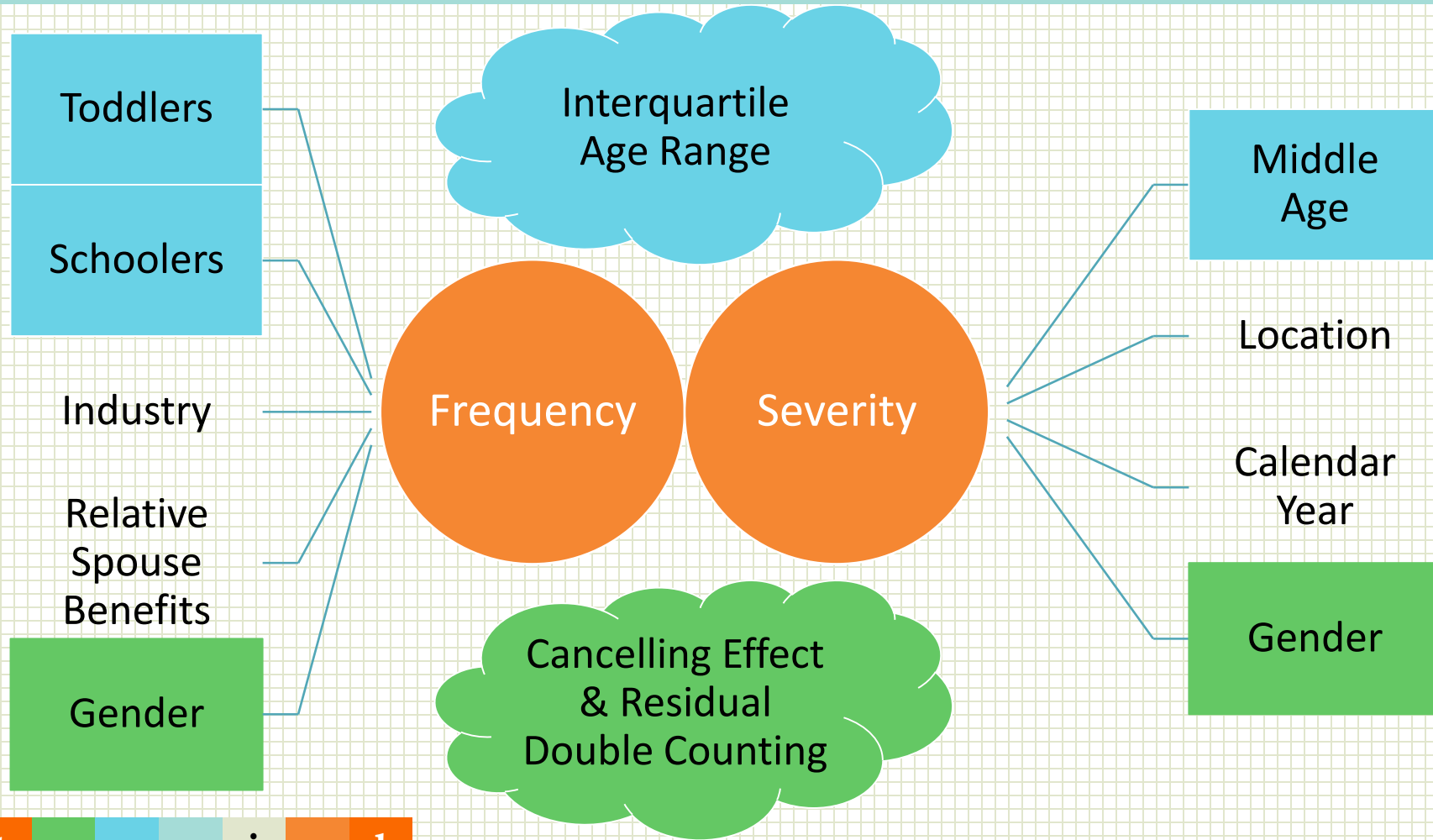
Pricing based on average experience result in anti-selection

Case Study 3  
Health Insurance

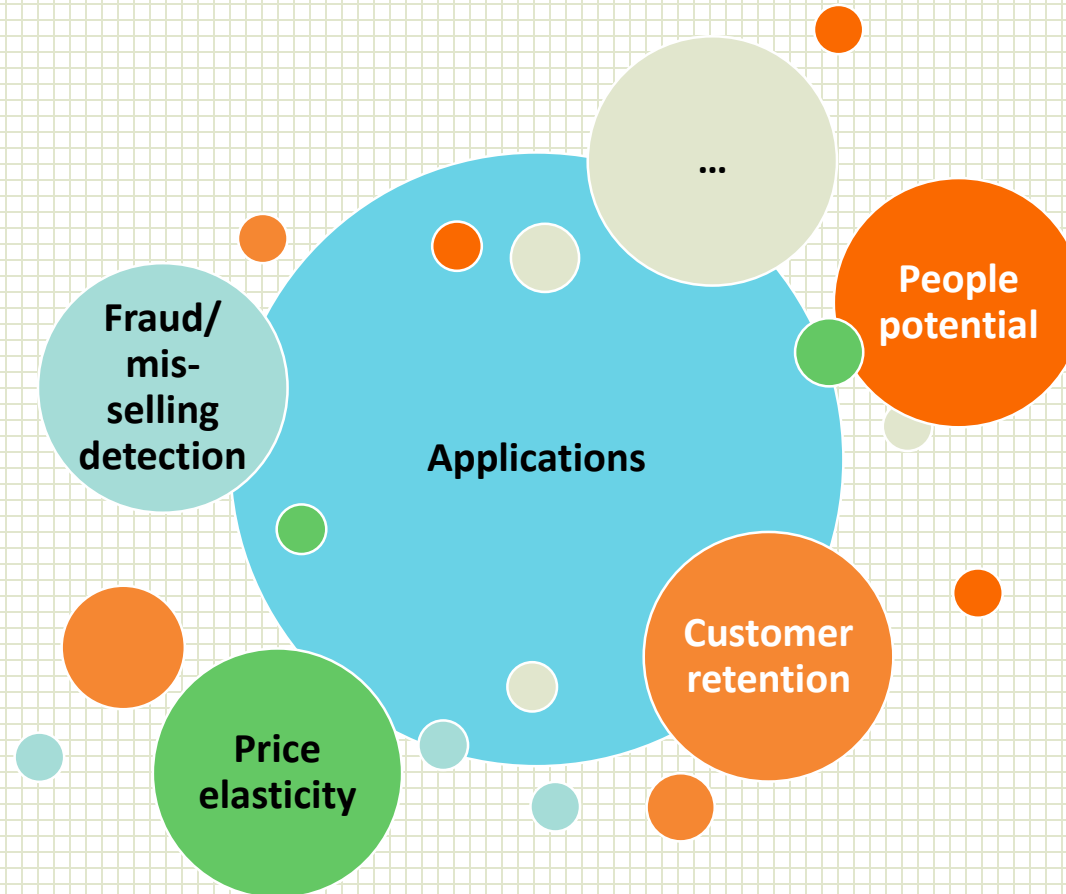
**Problem statement:**

**Accurate health insurance scheme pricing without historical scheme experience.**

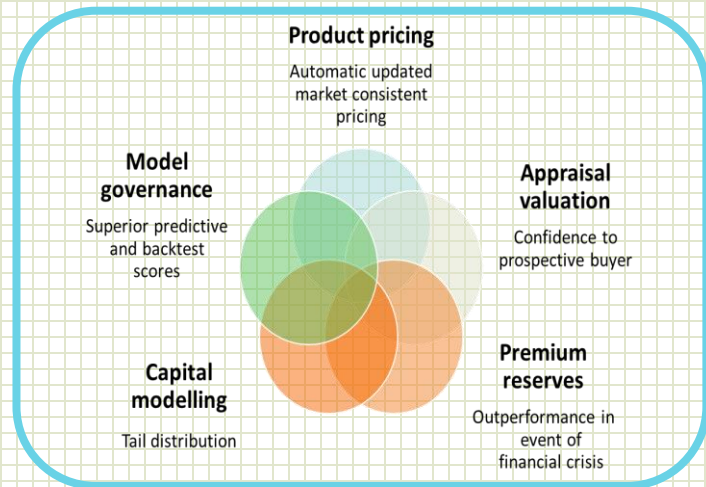
# Model Structure



# Other Applications



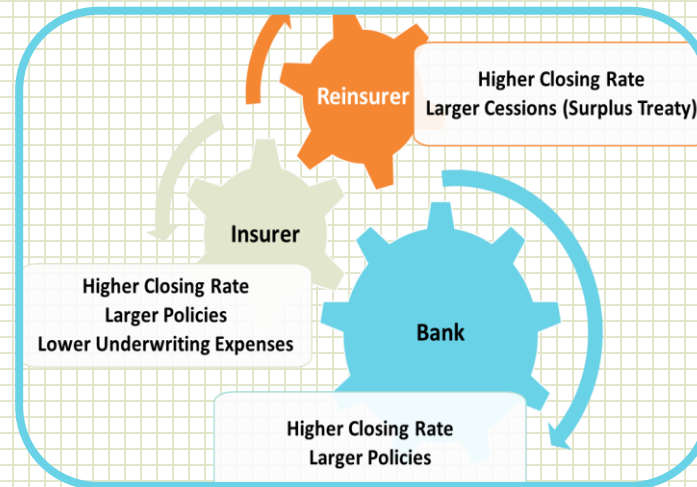
# Recap



## Case Study 1

### Unemployment Insurance

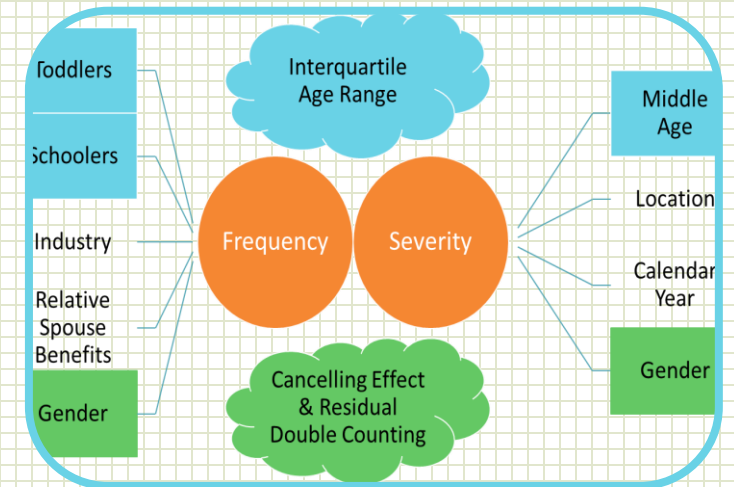
Key to Sound Overall Financial Management



## Case Study 2

### Medical Underwriting

Significant Revenue & Profit Contribution



## Case Study 3

### Claims Management

Long Term, Incremental Benefits to Actuarial Models

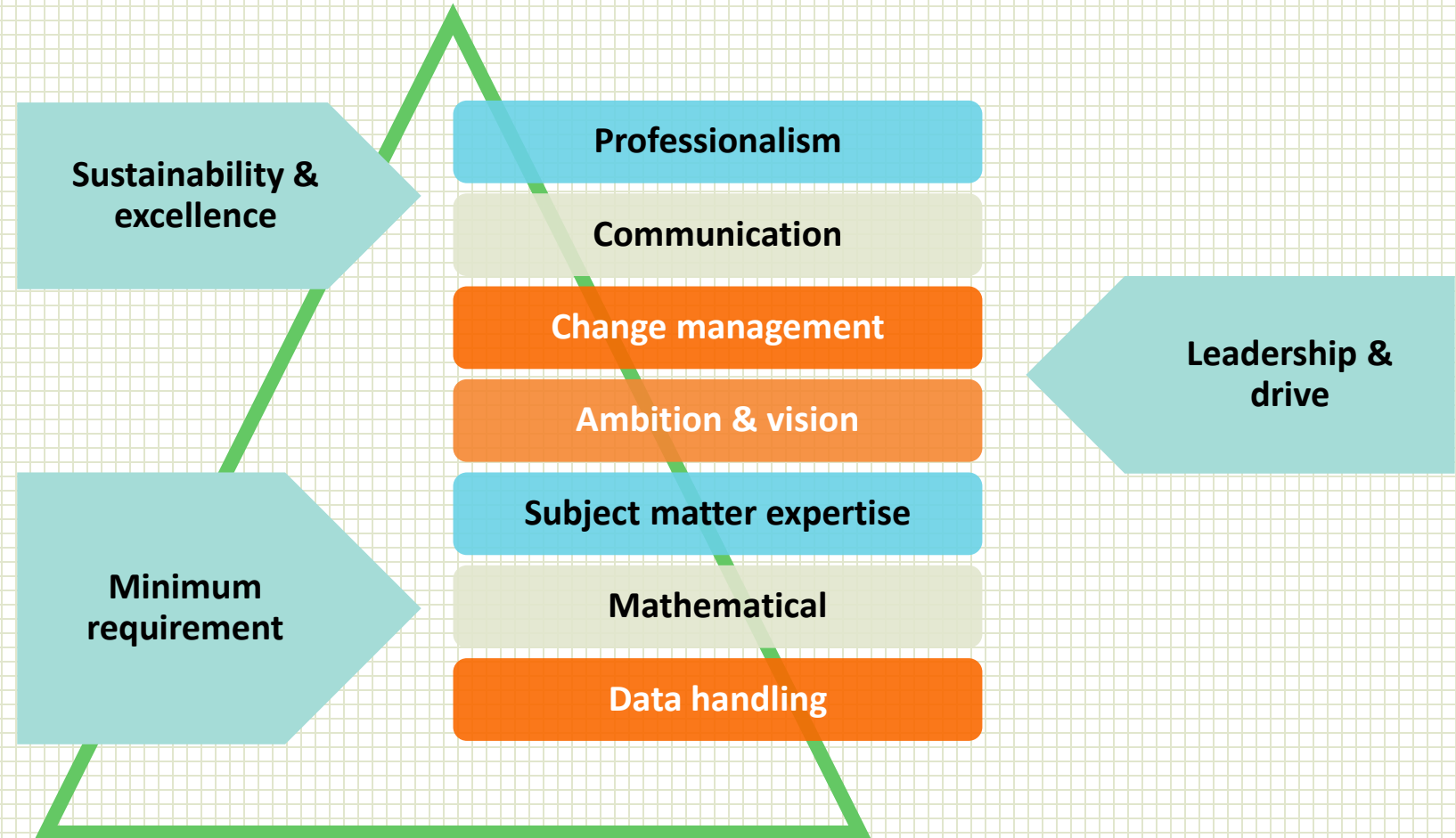
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Thank You

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n - a c t u a r i a l

# Expertise





# Learning

