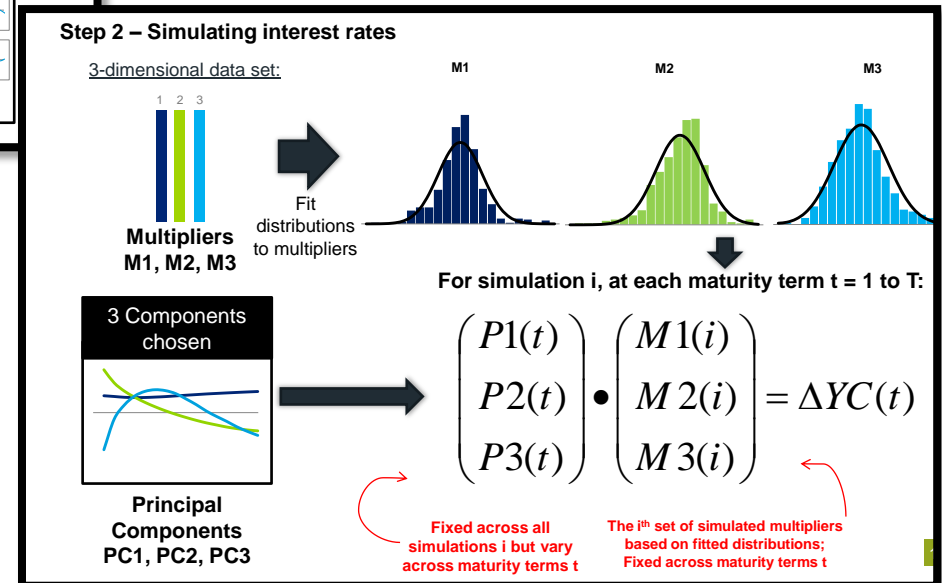
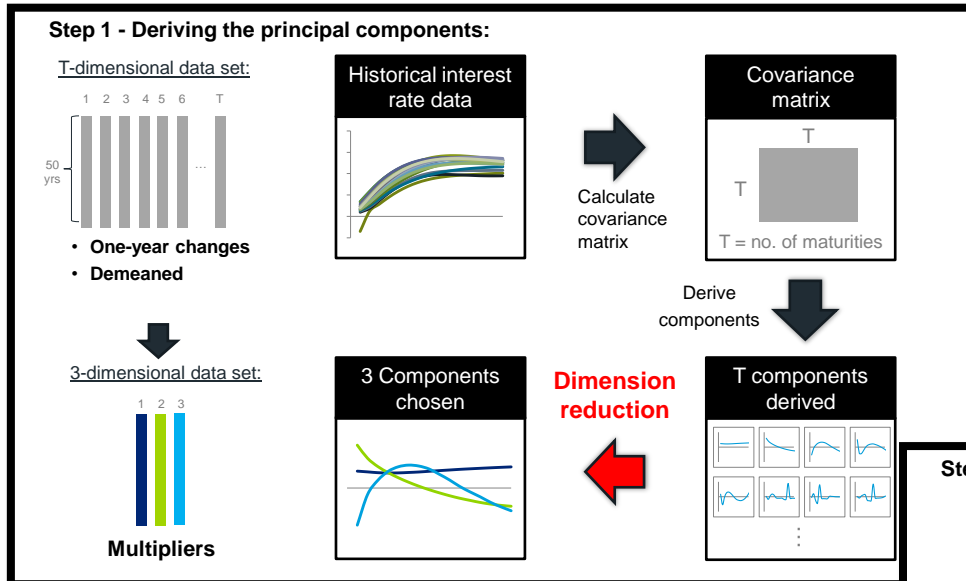


1. Introduction

1. Introduction

Big data and technical sufficiency – so what?



1. Introduction

Big data and technical sufficiency – so what?



1. Introduction

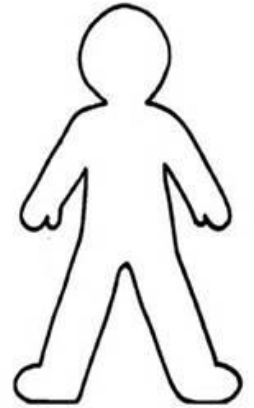
Data intelligence



Mathematics



Visualization

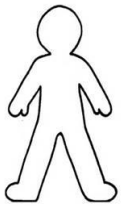


1. Introduction

Spectrum of understanding



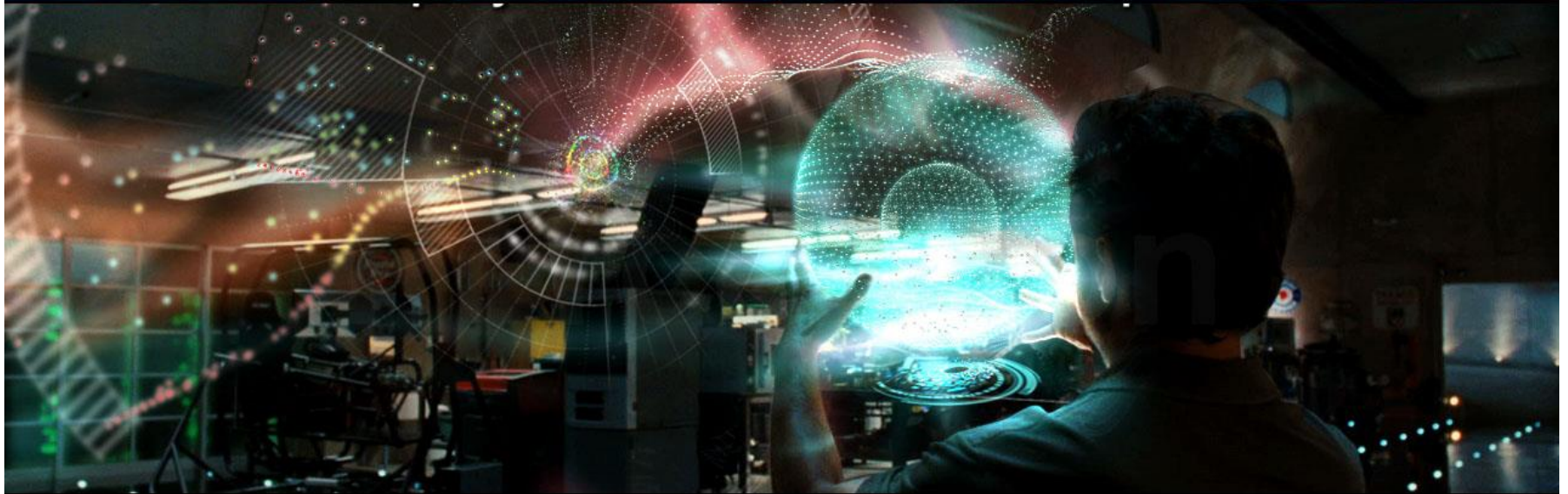
Practitioners



- Too much breadth
- Insufficient depth

Management





2. The Mind of a CRO

3. Risk Identification Framework

3. Risk Identification Framework

Visualising risk exposures

A VISUALISATION IS WORTH A BILLION DATA POINTS



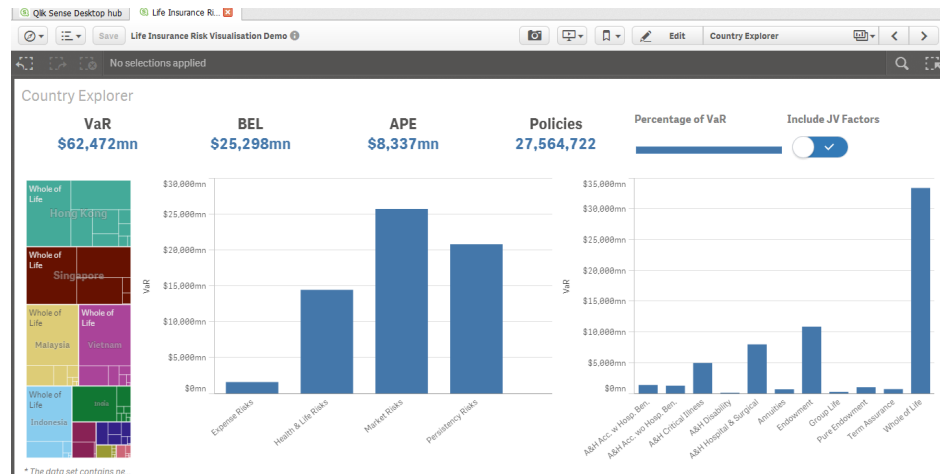
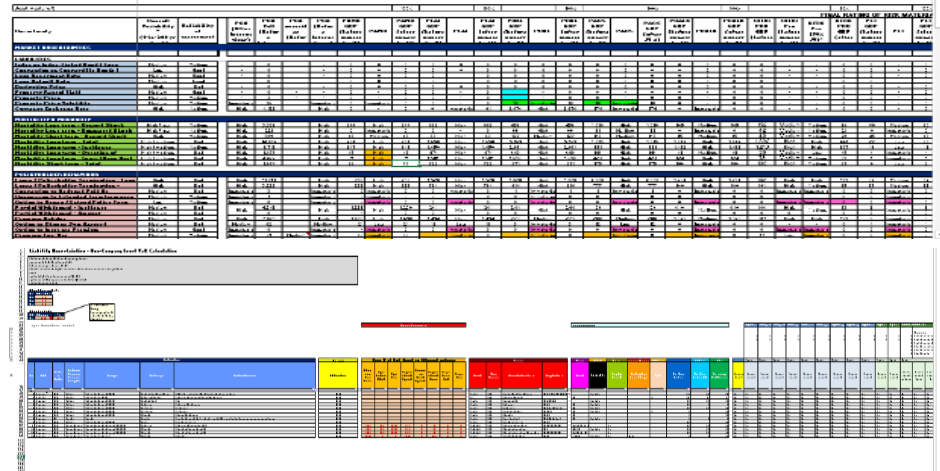
Visualisation focuses on presenting data in the most meaningful way, for quick delivery of insight to support decision making.



It involves making best use of graphical means to reinforce human cognition and facilitate understanding of insight.

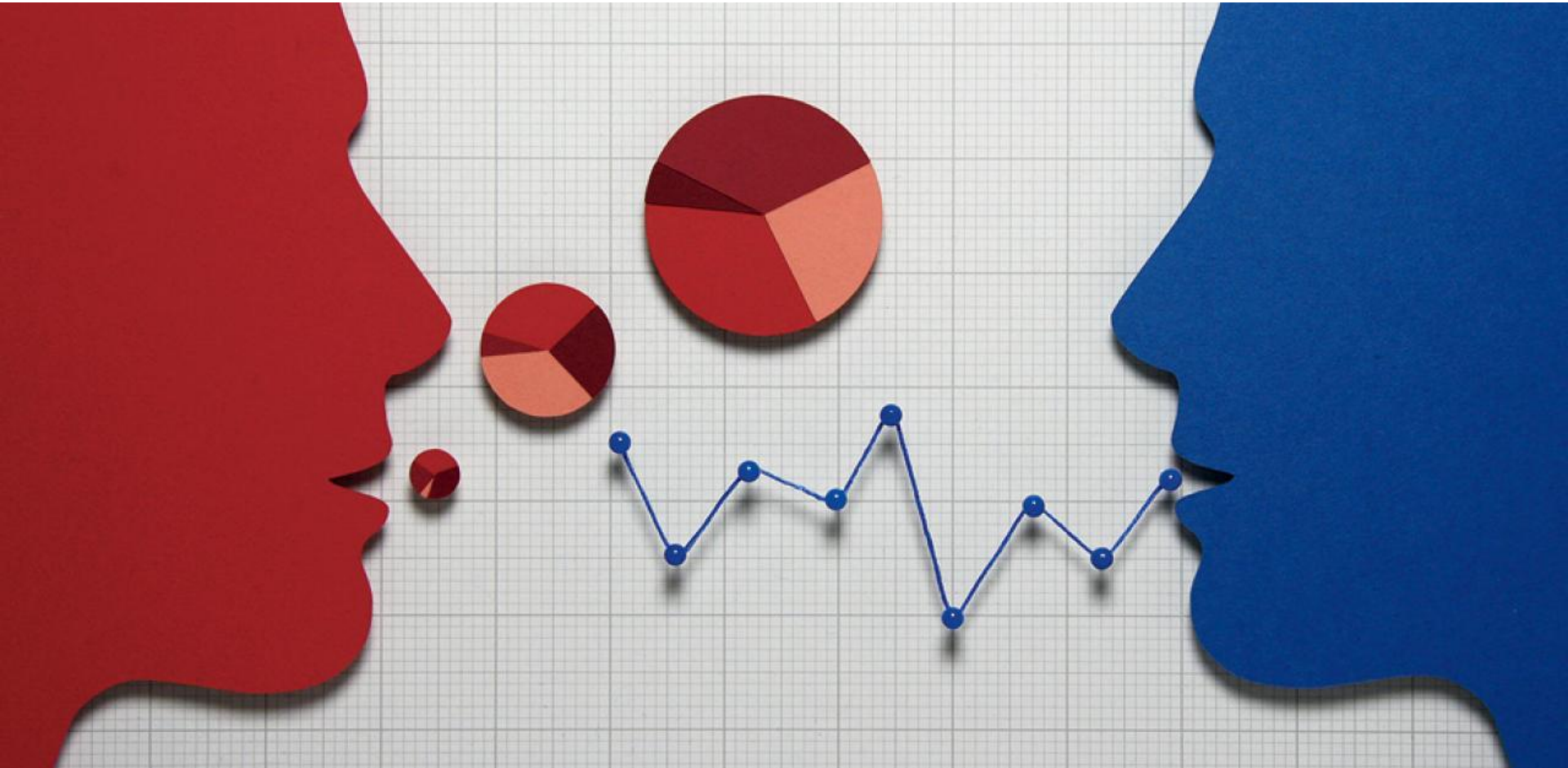


With technological advances that make it easier to routinely collect enormous amounts of data, there is an ever increasing need to understand large volumes of information at once.



3. Risk Identification Framework

A common language and platform



3. Risk Identification Framework

Criteria around a Risk Identification Framework



Risk Metrics

- Solvency position
- Liquidity position
- Statutory profits
- Embedded Value
- Economic Capital

Level of Confidence

- 90th percentile (1 in 10)
- 95th percentile (1 in 20)
- 99th percentile (1 in 100)
- 99.5th percentile (1 in 200)

Time Horizon

- 1 week
- 1 year
- Lifetime

Materiality

- Immaterial – threshold of X million VaR, leave unmodelled

3. Risk Identification Framework

Business information

Business environment information enables an assessment of the volatility of the underlying uncertainties.

Economy

- Market, Command or mixed, with varying degree of involvement from the government

Investment markets

- Restrictions in types of investments affects diversification

Demographics

- Degree of exposure to mortality/morbidity/longevity risk factors

Competitors

- Level of competitiveness affects uncertainty in lapse experience as well as new business sales and mix

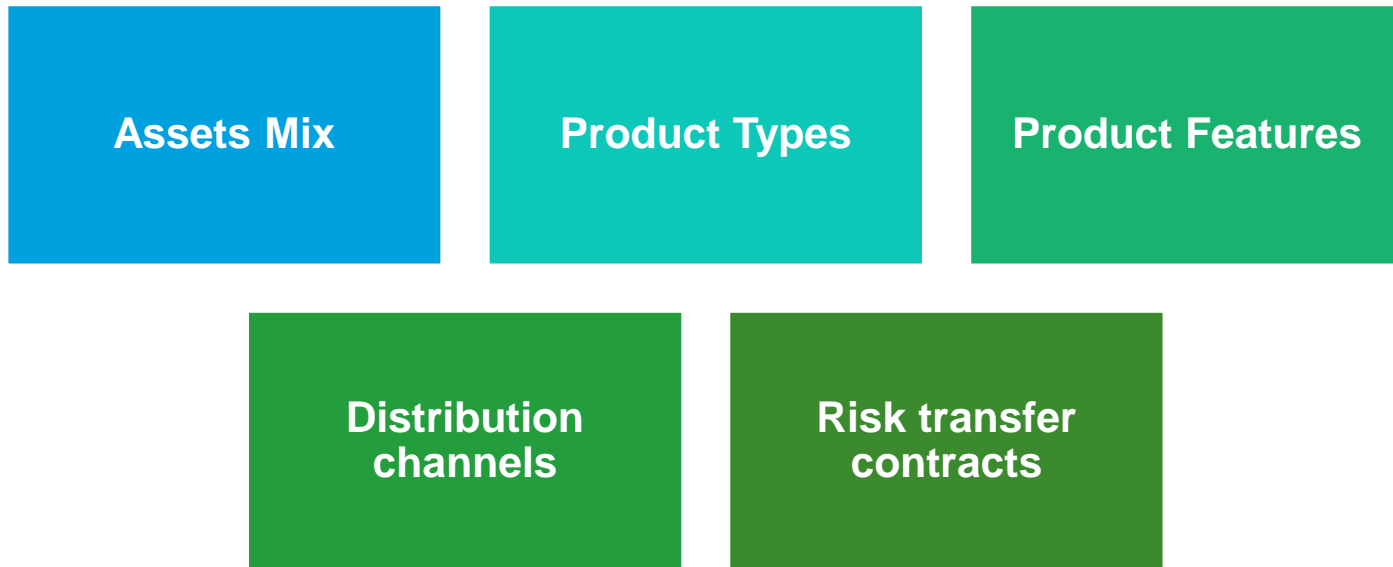
Alternative to insurance products

- The extent of availability affects sensitivity of lapses to perceived attractiveness of insurance products

3. Risk Identification Framework

Business information

The level of information gathered needs to be sufficiently granular so that exposure to specific risks can be determined.



3. Risk Identification Framework

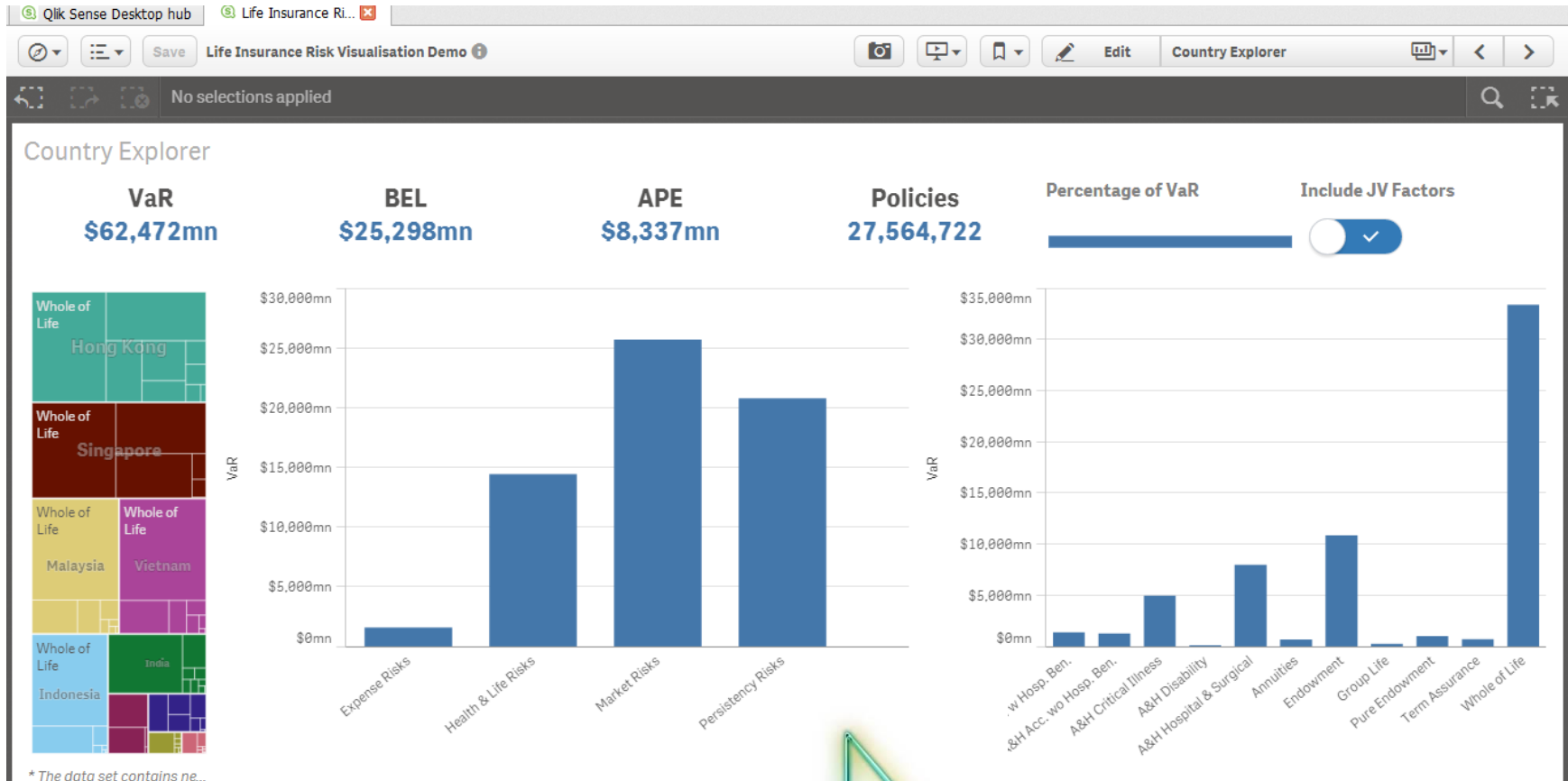
Uncertainty assessment

Uncertainty	Overall Variability * (1-in-200 yr shock)	Reliability of assessment	Est. VAR (\$m)	1. Quantitative assessment	2. Qualitative override	Dimensions of Uncertainty: not Closely Correlated
MARKET UNCERTAINTIES						
ASSETS						
Risk-free Interest Rate Level	High	Medium	1,471	High		Term structures, Geography, Currency, Government papers / Swaps
Equity Dividend Yield	Medium	Good	76	High		Currency
Equity Price	High	Medium	4,570	High		Sectors / Industries, Geography, Currency
Corporate Bond Spread	High	Bad	1,895	High		Credit rating, Term to maturity
Corporate Bond Default Rate	Medium	Medium	17	Medium		Credit rating, Term to maturity
Property Rental Yield	Medium	Good	1	Immaterial		Currency
Property Price	Medium	Medium	29	Medium		Land vs bricks & mortar, Commercial vs residential, Direct vs property fund, Location Currency
Currency Exchange Rate	High	Medium	4,454	High	Medium	Currency
Government Bond Spread	High		67	High		
LIABILITIES						
Risk-free Interest Rate Level	High	Medium	3,110	High		Term structures, Geography, Currency, Government papers / Swaps
Risk-free Interest Rate Volatility	High	Bad	0	Immaterial		Term structures, Geography, Currency
Equity Dividend Yield	Medium	Good	80	High		Currency
Equity Price	High	Medium	4,452	High		Sectors / Industries, Geography, Currency
Equity Price Volatility	High	Medium	0	Immaterial		Sectors / Industries, Geography, Currency
Corporate Bond Spread	High	Bad	638	High		Credit rating, Term to maturity
Corporate Bond Default Rate	Medium	Medium	5	Low		Credit rating, Term to maturity
Property Price Volatility	Medium	Medium	0	Immaterial		Rental yield, Location, Direct / Property Fund
MORTALITY & MORBIDITY						
LIABILITIES						
						Death by accident/Death by illness, Age based mortality

4. Data Business Intelligence

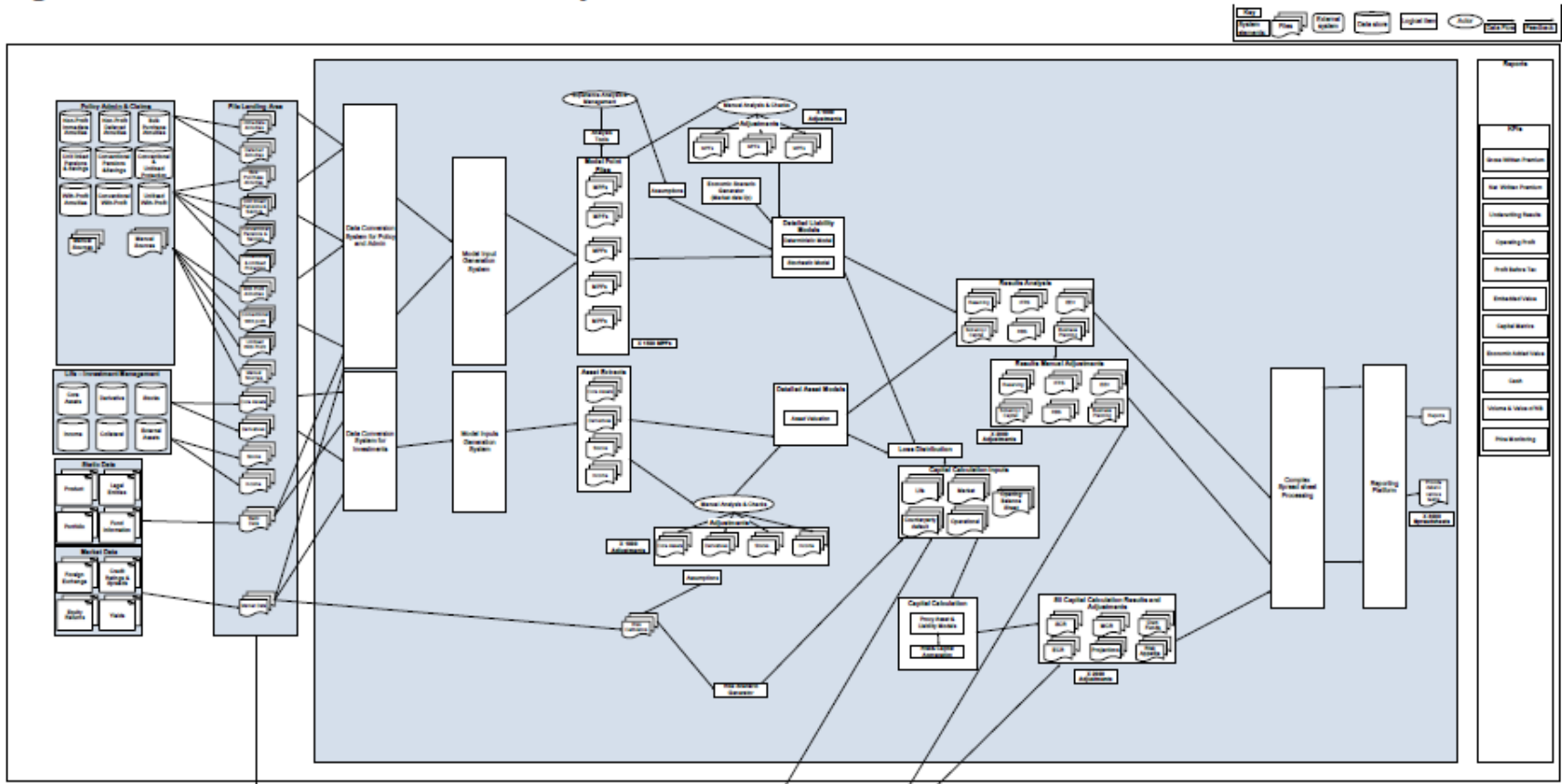
4. Data Business Intelligence

A common language and platform



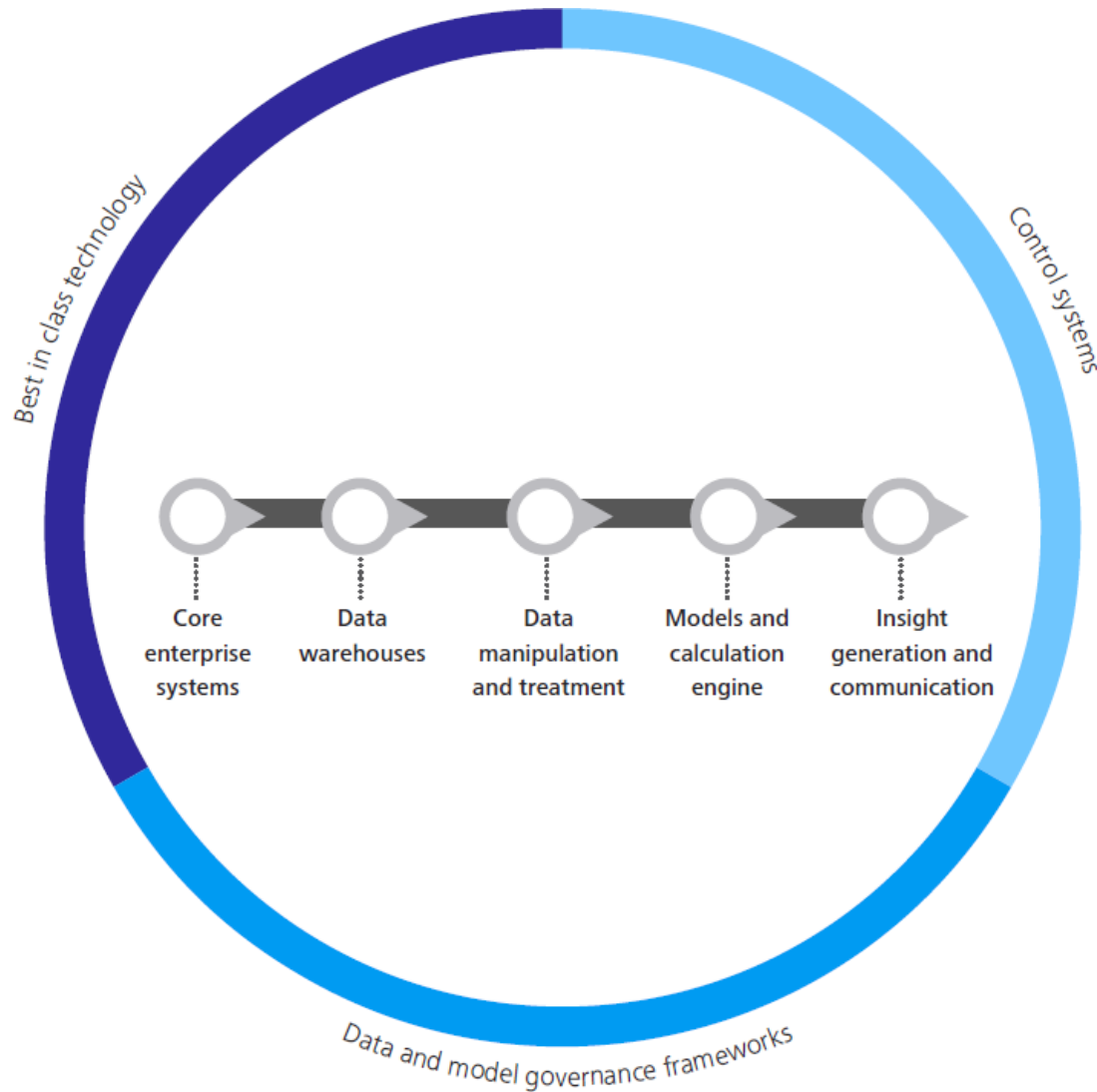
4. Data Business Intelligence

A single source of truth



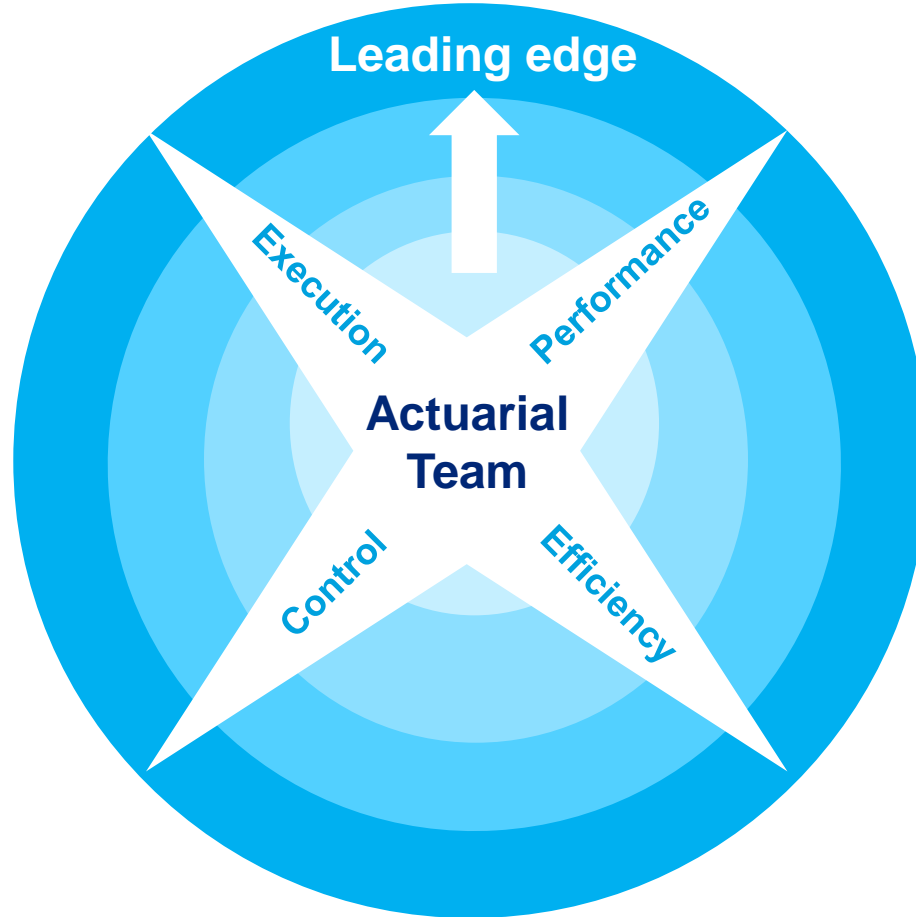
4. Data Business Intelligence

A single source of truth



4. Data Business Intelligence

Value-add from actuaries



4. Data Business Intelligence

Value-add from actuaries

Scenario:

The Chinese insurance market is stressed from the credit crisis and poor economic performance that several smaller insurers are at the brink of becoming insolvent. In light of this, the Chinese government decides to intervene. The government changes the regulation so that foreign investors are allowed to hold more than 50% of local insurance company, subject to approval from CIRC.

The CEO is considering purchasing the remaining shares of its Chinese business unit. Based on the risk profile of China, do you think there is evidence to support this decision?

4. Data Business Intelligence

Power of an interactive risk analysis tool



4. Data Business Intelligence

Power of an interactive risk analysis tool



4. Data Business Intelligence

Power of an interactive risk analysis tool



4. Data Business Intelligence

Power of real-time information

$$\begin{aligned} & \textit{Risk Free Interest Rate VAR Estimate} \\ & = (\textit{Absolute BEL} * \textit{risk free rate} \\ * & \textit{Outstanding average duration}) * \textit{Shock} \end{aligned}$$

