Overview

The way we use models is evolving

• Many have been built with regulation in mind
• Businesses are realising the value of the information they can provide

Increased demands on modelling teams

• Increased business demands
• Regular use
  – Regulation, RI purchase, asset allocation, risk reporting
• Ad hoc use
  – Management questions, economic response
Agenda

- Introduction
- Challenging the way we communicate
- Challenging the process
- Next generation

Introduction

Modelling teams need to evolve to stay ahead:

- Effective and efficient communication with the business
- Faster, more efficient processes
- Improved accuracy

Aim:

- More time thinking about risk solutions
- Better decision making
Case Study

2017’s Surprise – Ogden

- Systemic risk
- Average of 20% hit on Motor reserves*
- Event description
  - Systemic change to settlement of claim awards
  - In response to poor economic environment
- Are similar events lurking elsewhere?
- How can we spend more time looking for them?

* KPMG benchmarking

Communication

- Focus on the output of the process
- Can we better meet business users demands?
  - Most desire a top-down storyboard
Communication

• Analytics options
  – Existing Excel-based reporting
  – Dynamic Dashboards
    • The rise of business intelligence solutions: Qlikview, Tableau, etc.
  – Static, but automated, dashboards
    • R, Python, etc.

• How/why can they help?
  – Consistency of reporting for users
  – Ability to explore data and drivers
  – Designed to raise questions from the consumers of information and promote understanding

Images from https://bokeh.pydata.org/en/latest/
Model Output - Analytics

Communication

• Advantages
  – Once set up, quick to run and update
  – Ease of exploring output, better top-down validation
  – Fast insight generation

• Dangers and Challenges
  – Detailed data being taken out of context
  – Lack of control over actions arising from users’ exploratory activities
  – Difficult to contextualise the detailed data to users
**Challenging the Process**

- Modelling processes have evolved slowly over recent years
- How does the process meet the needs of the business?
  - Regulatory use – Solvency requirements, ORSA
  - Regular business use – RI purchase, business planning, business metrics
  - Ad hoc – Economic scenarios, business scenarios, M&A, strategy planning

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**Objective:** Maintain *rigour* for regulation but *agility* for the business, and prepare for the future!

**Additional Benefits:**

- Create capacity to focus on risk analysis
  - Free up time, simplify the process
- Create a clear, repeatable process
  - Easy to validate, clear and robust
- Create a scalable process
  - Next generation of data, more predictive factors
  - Can your process handle another 5-10 years of claims and policy data
Challenging the Process

• Challenges with current processes:
  – Contain repeatable calculations, often with manual adjustments
  – Time consuming exercise
  – Consistency with other areas of the business
  – Availability of data

• Three tools for discussion:

Optimisation
Manual Analysis:
- Manually check data and reports. Apply manual adjustments
- Prepare analysis, charts and narrative
- Compile reporting and submit for review

Optimised Process:
- Bot reviews data and flags any errors and makes recommendations
- User Reviews findings and adds additional analysis

Approach
- Review data architecture and process flow
- Identify areas for efficiency gains:
  – Step reduction
  – Automation
  – Collaboration and reporting
- Control
  – Strategic validation
  – Review, challenge and feedback
  – Continuous improvement
Automation

Robotic Process Automation (‘RPA’) can consist of:

- Automation using scripts, programming, and macro-like interfaces
- Rules based actions – such as drawing out movements
- Self-learned behaviours – recognising keydrivers and pre-populating narrative

Automation of existing procedures:

- For example aggregation of Procedure to develop an initial risk calibration
- Automate data processing, analysis and reporting
- Actuary can then review the data and calibration in one step and feed back if necessary

Automation - RPA

Streamline a manual reserving process in 10 weeks:

- 8 of the 18 high-level manual tasks automated in the analysis process.
- Automated 18% of analyst effort in analysis
- We also identified process re-engineering opportunities (incl. RPA)

Expected to reduce analyst effort approximately 50%
Optimisation and Automation Benefits

• Less time producing charts, more time with the business
  – Maintain an efficient and rigorous process
    • Efficient and effective validation
  – Respond quickly to changes in the business and requests
    • Consistent business information
  – Create capacity to develop look forward

• Ability to expand
  – More detailed data used for calibration and analysis
  – More predictive factors can be included
    • Better understanding of dependencies
  – Enhanced behavioural modelling

Next Generation Development

An optimised capital process can handle much more data and information:

• Is it required, will it benefit the model?
  – Greater detail during analysis, yes!
  – Greater detail in the model, maybe!

• New tools for handling data
  – Data Automation
  – Analytics and insight
  – Machine Learning

• Detailed data
  • Pricing info
  • Expert judgements

• GLM
• Neural Networks
• Tree based methods
• Clustering

• Representation of complex relationships

• Risk Calibration

Data

Machine Learning Toolkit
**Next Generation Development**

Reserve Risk Calibration Example

- Existing chain-ladder and reserving techniques link development factors to development period

- At an triangle level, we can include more information to compare

- Build towards a more granular approach
  - Scalable

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**Challenging the Norm:**

- Re-thinking communication
  - Methods which scale with increased data
  - Can communicate complex relationships

- Re-thinking the process
  - Build an efficient process
  - Leverages skills effectively
  - Can handle another 20 years of detailed data

- Build for the future
  - Broaden the analysis
  - Improve our understanding of risk
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