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MUQ

Sarah MacDonnell, LCP
Alex Marcuson, Marcuson Consulting
Seema Thaper, Deloitte
Susan Dreksler, PwC

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MUQ (Measuring Uncertainty Qualitatively)
Stage 1: Bring together work that has done before into one place

Framework

Alternative approaches

Measuring uncertainty beyond "Bootstrap"

Framework elements

- Data uncertainty
- Expert judgement
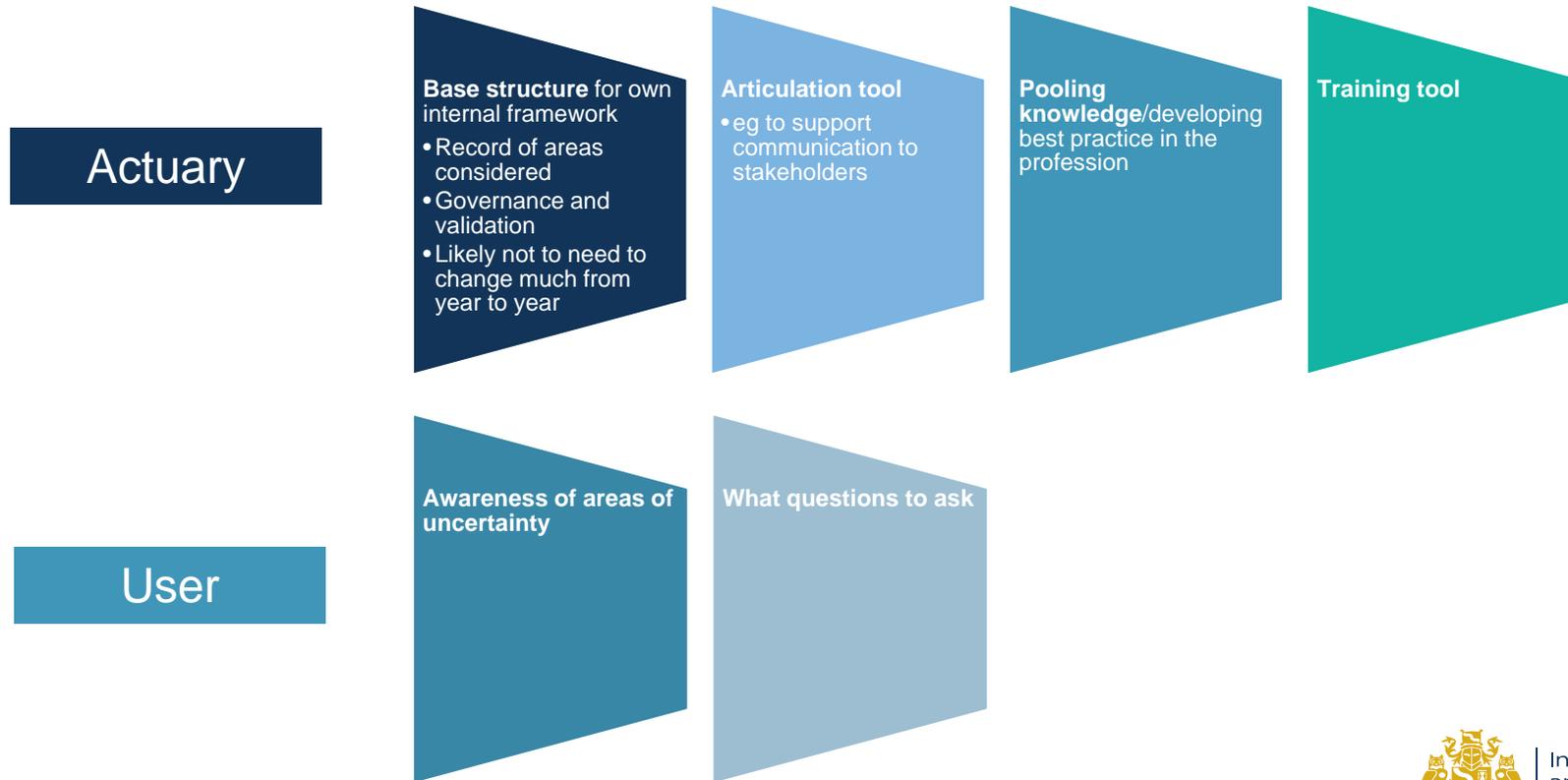- Effectiveness of methods
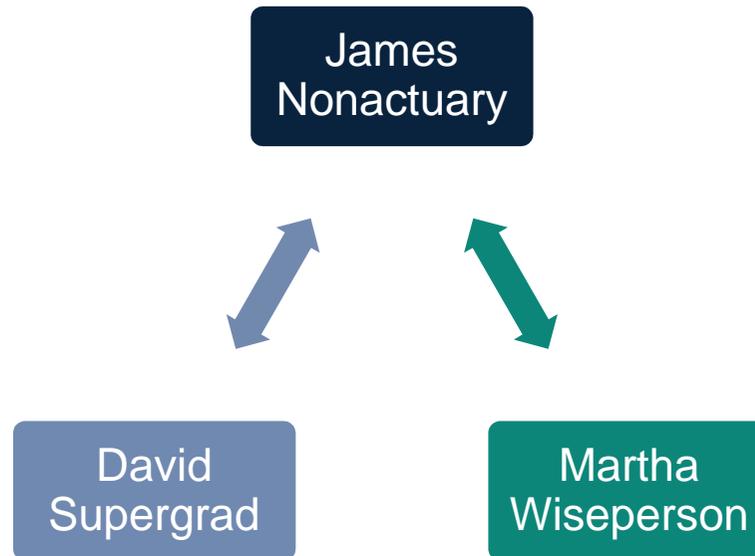- Reserve risk appetite

Alternative approaches

- Models for aggregate triangles
- Individual claims reserving
- Interaction with capital models

Stage 2:
"Do something about it"

Framework uses

Actuary

Base structure for own internal framework
- Record of areas considered
- Governance and validation
- Likely not to need to change much from year to year

Articulation tool
- eg to support communication to stakeholders

Pooling knowledge/developing best practice in the profession

Training tool

User

Awareness of areas of uncertainty

What questions to ask

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Case study

Case study

James Nonactuary, CFO, BigInsCo is planning to attend the Reserving Seminar to see what all his actuaries get up to in their spare time.

A week before he is due to attend he approaches David Supergrad and Martha Wiseperson, two members of his actuarial team with the following problem…

> James has been invited to watch the Andy Murray match at **Wimbledon** at 6pm by Megaconsultants Ltd. on the day of the reserving seminar.

> At what time will he need to leave the reserving seminar to be pretty certain of making the start of the match?

James rushes off to a meeting shouting "be realistic, tell me I need to leave the seminar at lunch and I'll waste 5 hours stuck in a café outside Wimbledon!" and asks for a response the day before the seminar itself.

Taking into account what will be important for James, put together a short list of things Martha needs to consider to come up with her estimate.

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David Supergrad

- Using a web interface with Excel David takes the following approach.

    § Every 15 minutes for the next 5 days he uses google maps to sample the time planned to get from the reserving seminar to Wimbledon using the "underground" icon, which incorporates walk time at either end.

    § Wanting to be super-careful, David inputs the just under 500 observations into an Excel spreadsheet and takes the value at the 95th percentile.

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Martha Wiseperson

Martha looks at her MUQ framework, making sure that she thinks through all aspects of the question…

> ## What headings should Martha have in her framework?

External influences

Items that could potentially affect any travel time

§ What time of day the travel is at and does this change how past data can be used

§ What time of year the travel is at and does this change how past data can be used

§ Whether there is any planned/unplanned engineering work and how this could affect all types of transport

§ Whether everyone is going to Wimbledon at the same time, which could affect travel times

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Underwriting risk

Underwriting risk in this context is the risk that the wrong question is being answered – essentially that the terms and conditions of the question are different to what the actuary assumes at the start of the process.

§ James expects you to know (but doesn't tell you) that he needs to pick up Mrs Nonactuary from Islington on the way

§ James hates the tube and won't use it

§ There is a 30 minute queue for the security line before anyone can into Wimbledon

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Communication

This is about communicating with all areas to find out information

§ James' PA may be able to tell you that he does not like using contactless technology and will have to queue up for a ticket

§ Internal travel assistants may have a preferred supplier for London travel that must be used

§ Has anyone had to do this calculation before for James and what the outcome of the model and what actually happened

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Martha's Framework
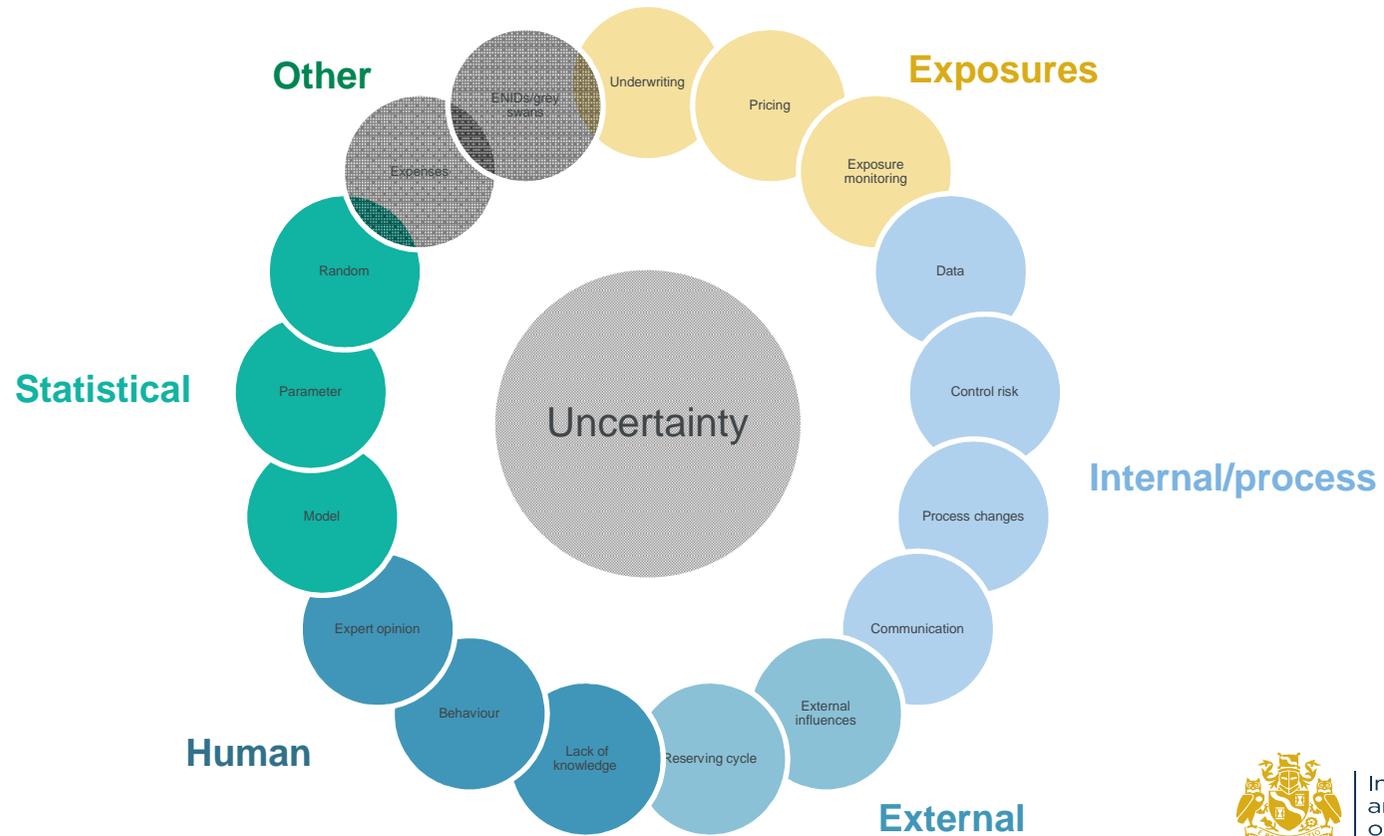
Case study
The Results!

James is presented with two best estimates and two distributions

David Supergrad	Martha Wiseperson
• 95th percentile is 52 minutes • As the last but one seminar ends at 5pm, David decides to suggest to James that he can leave after the last but one seminar	• 90% chance of getting into the corporate area at Wimbledon from the reserving seminar within 2 hours • Martha confidently decides to instruct James he can leave at the start of the last but one seminar

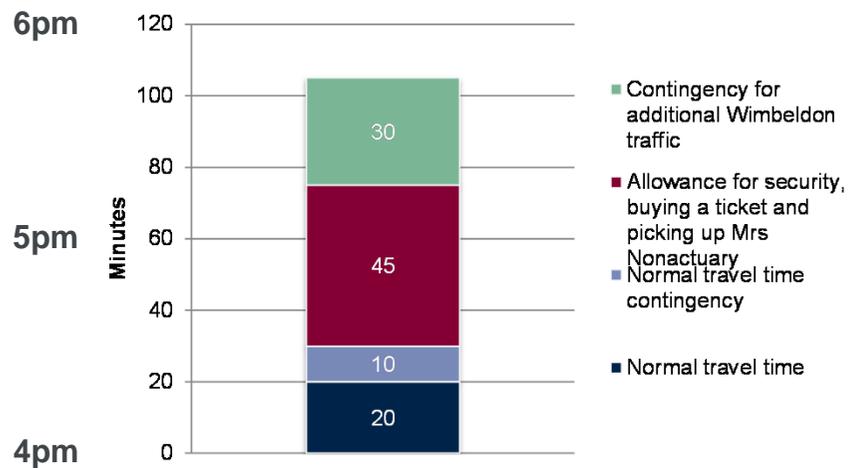"Bloody actuaries – is it one hour or two hours – one's double the other.

Don't tell me it can be one of a range of results, I've heard that one before!"

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Results
Martha

Leave at 4pm - the start of the last but one seminar (2 hours before start)

Key points
1. Assumes travel by taxi
2. Adjusted for seasonality and time of day
3. Last but one seminar is on measuring uncertainty and lasts for one hour
4. Match starts at 6pm

Key areas of uncertainty
- Normal travel time is based on 3 year's of data from real time journeys taxi timings.com
  - Contingency of 10 minutes based on 90th percentile

- If leave 15 minutes later, congestion due to Wimbledon effect will increase, but there is limited data to base this on

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Want to help shape the framework?

sarah.macdonnell@lcp.uk.com

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