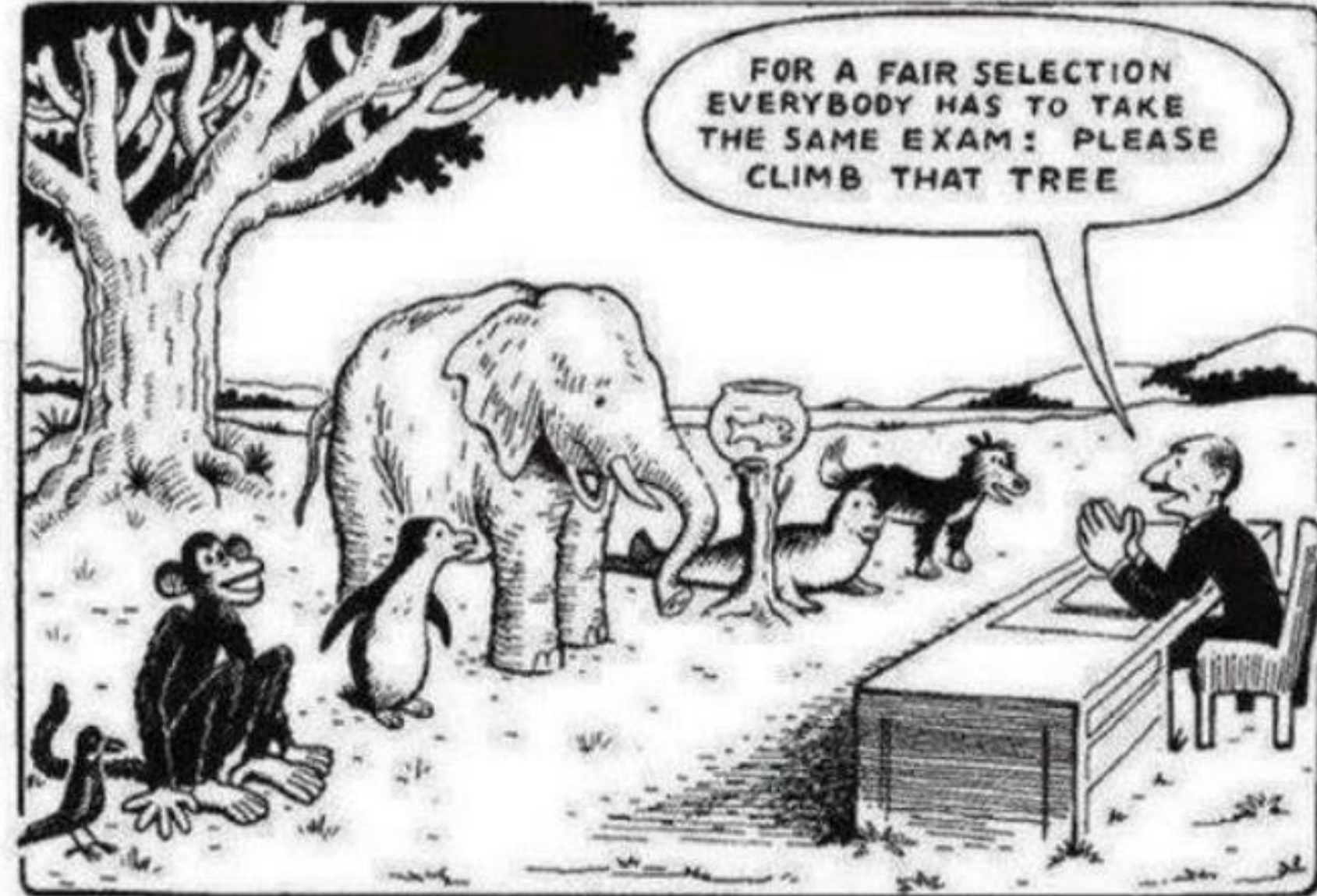


# One Size Does Not Fit All!

The Diversity & Evolution of QRA Throughout a Project Lifecycle



# One Size Does Not Fit All!

The Diversity & Evolution of QRA  
Throughout a Project Lifecycle

...Or

All the things that Ai Still Can't Do!

...Or

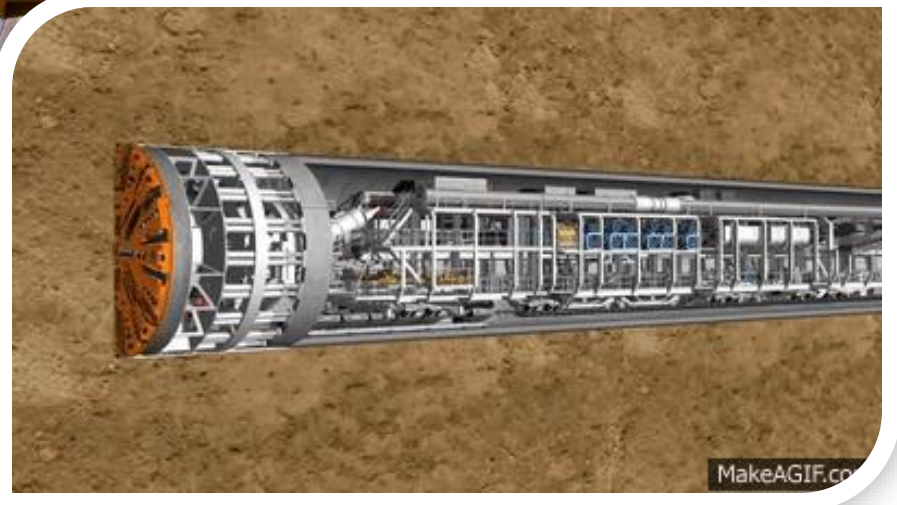
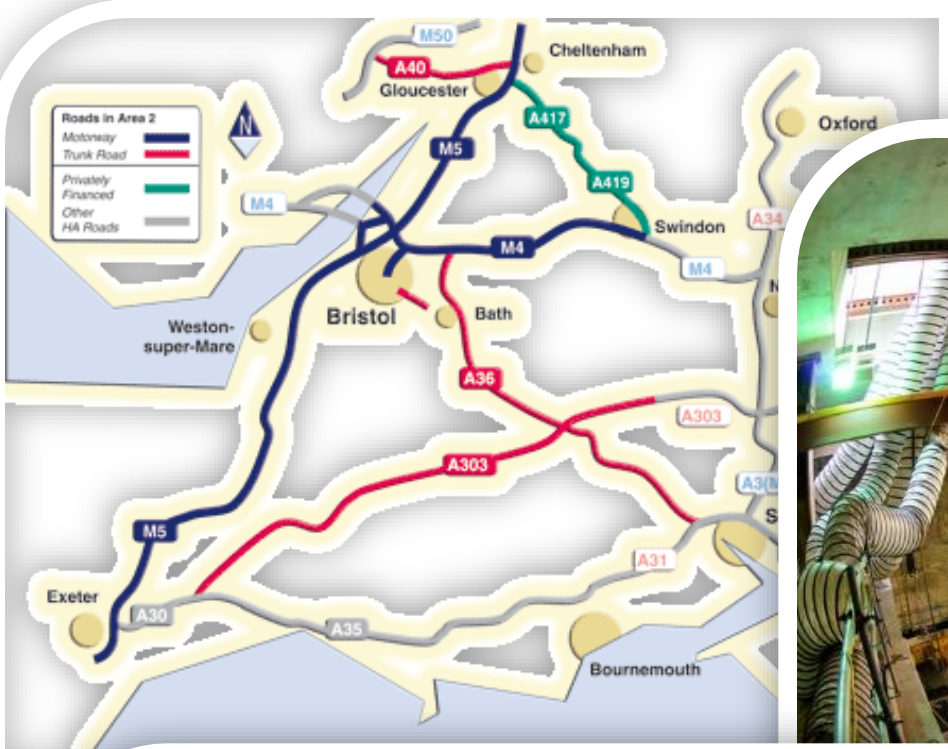
All the things that you could be  
doing, but probably aren't!



Safran Risk



Project Controls  
**EXPO**  
Washington, DC - USA



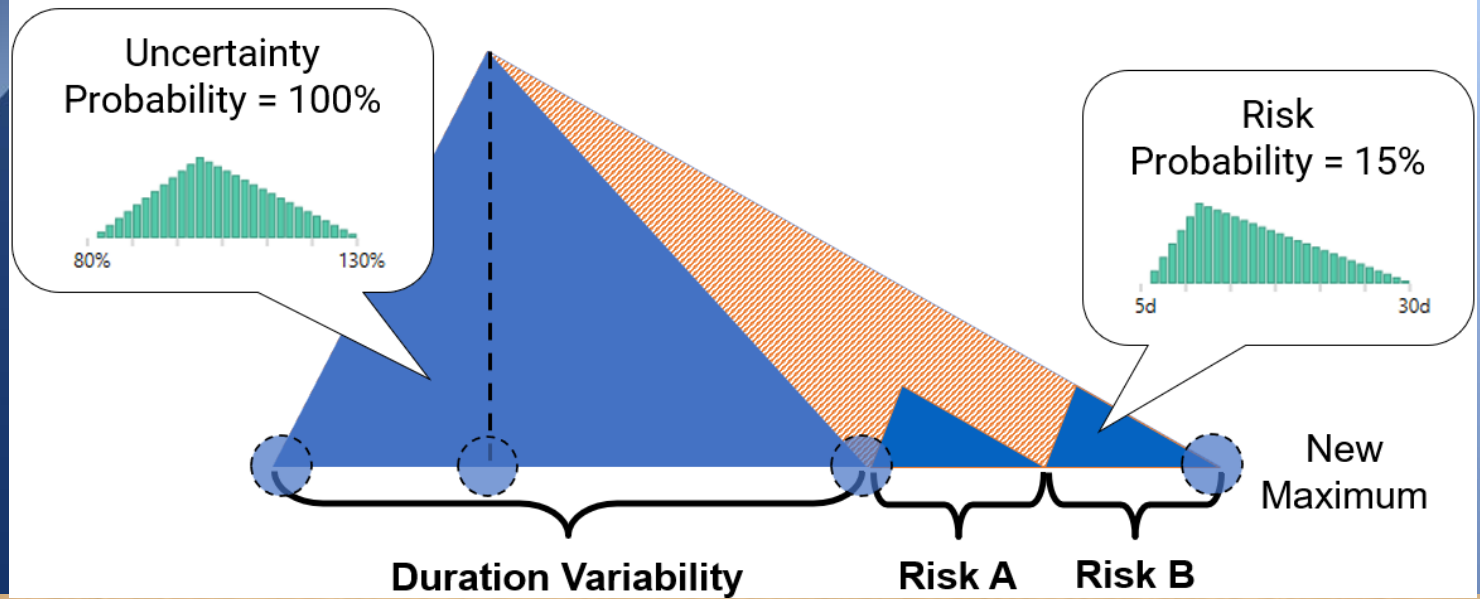
Since 2006





# Winning at QRA!

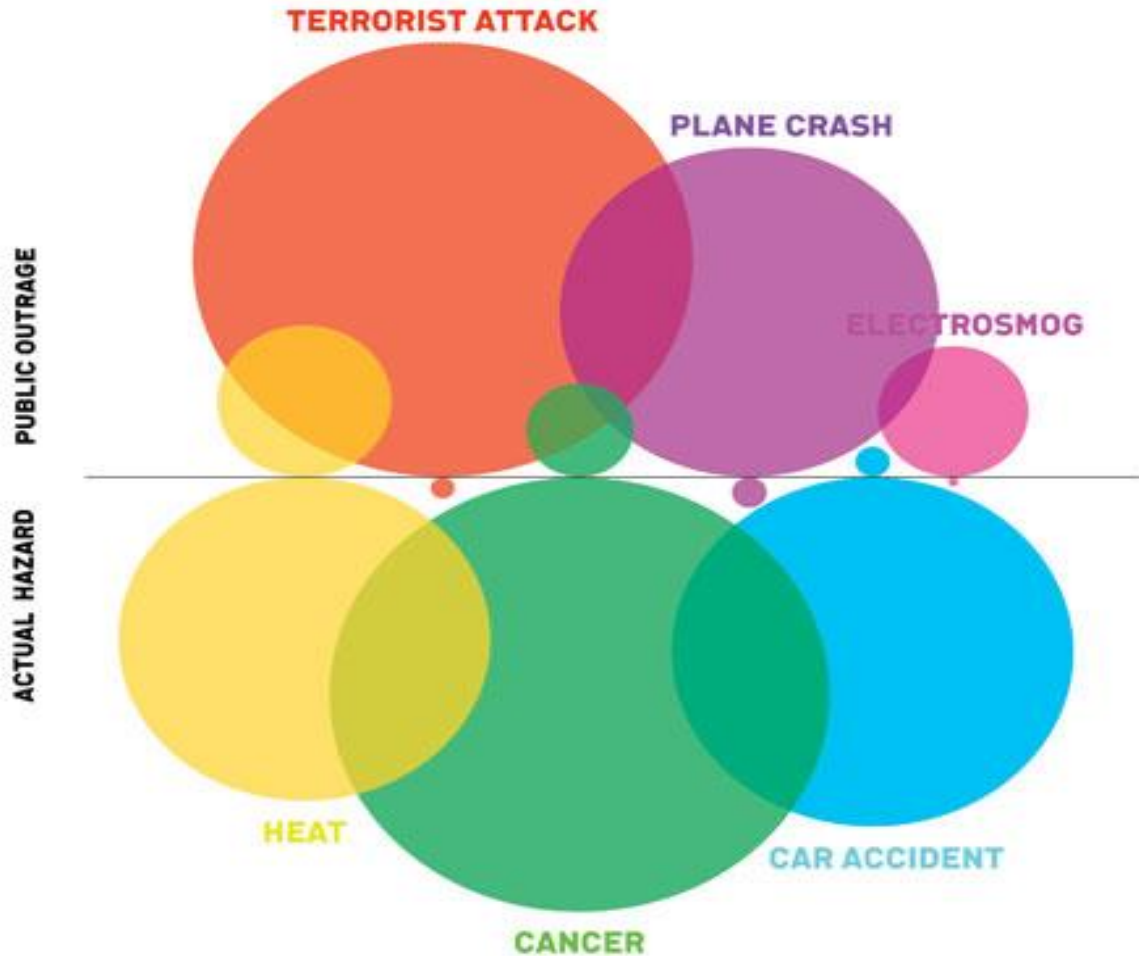
## Quantitative Risk Analysis



**UNCOVER THE BENEFITS**



# RISK PERCEPTION AND ACTUAL HAZARDS



2010

Created Consistent Capture of “Actuals”

- Compare Perception of Risk vs. Reality of Risk.
- Proportional Mitigation Recommendations
- Improved Future Estimates
- Lessons Learned & Shared

Coffers



2012

Supported a Business Case for Pre-Fab  
Modules to de-risk a Megaproject

- Positive not Doom  
(Risk as a force for Good)
- Genuinely Helped

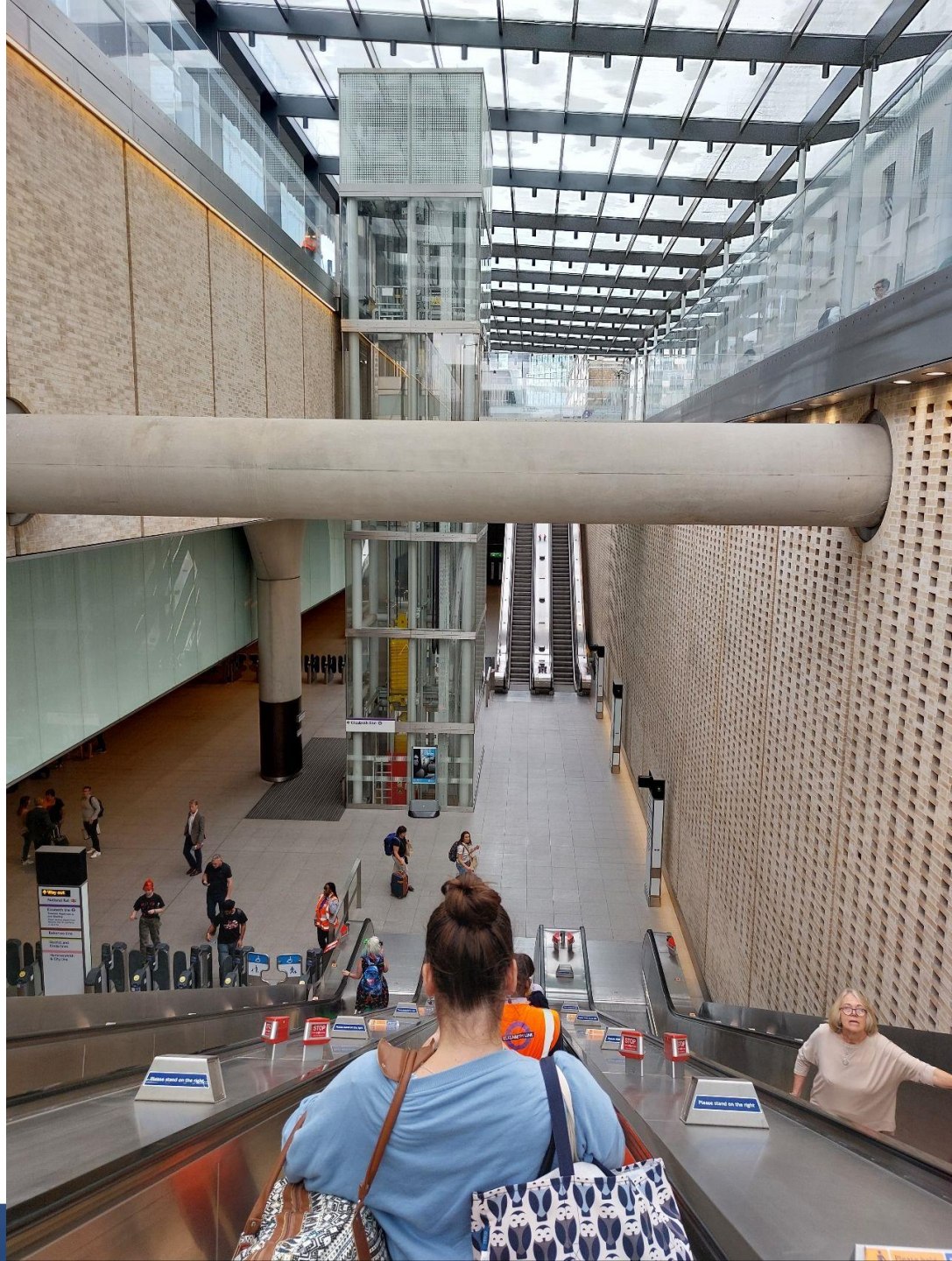


Safran Risk









2013

Justified millions dollars worth of  
additional contingency  
via Change Control

*“This is unheard-of!”*





2015

QSRA challenged key railway access constraint

- Convinced 3<sup>rd</sup> Party to re-plan their work
- It was easier than expected
- All parties Win-Win

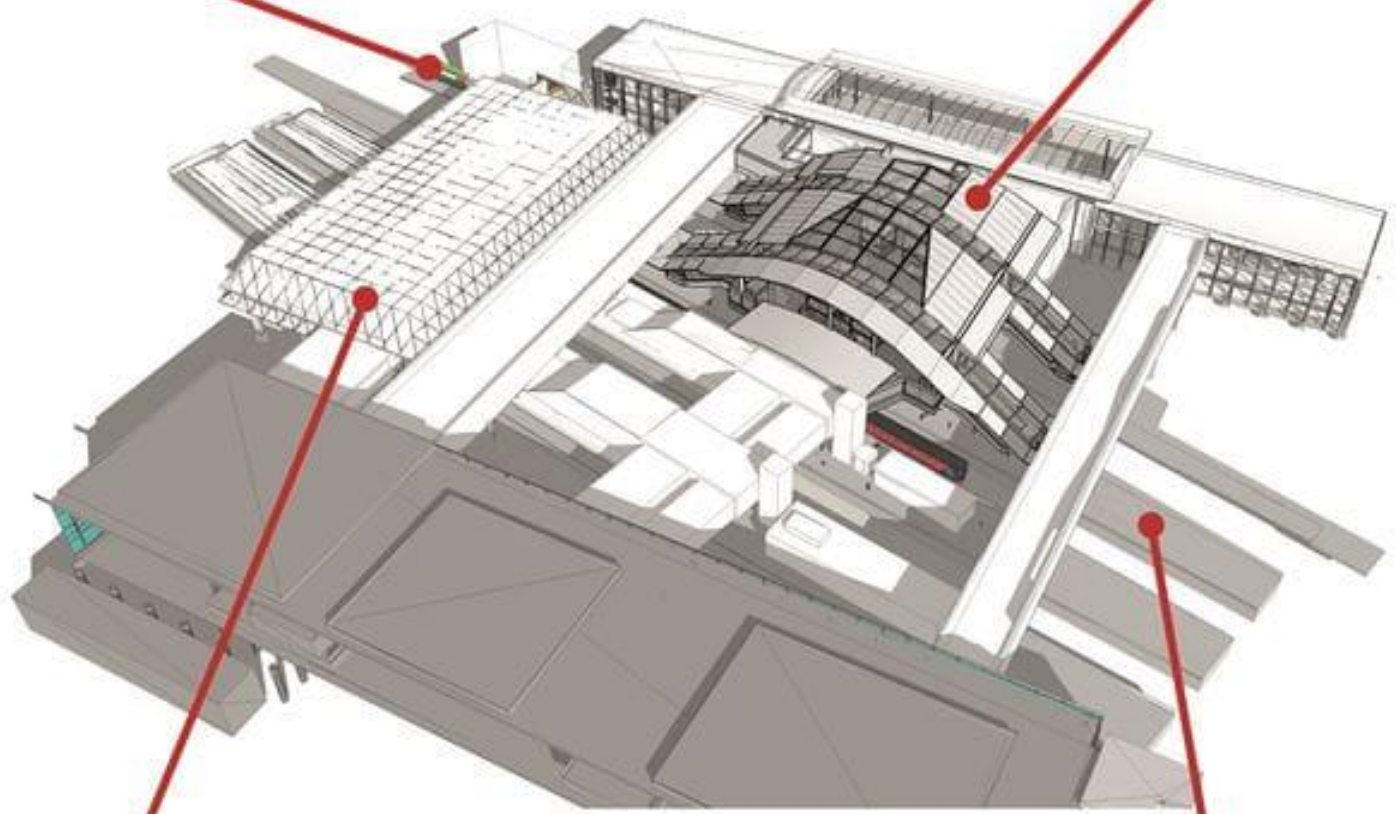


New staff accommodation

New concourse building with new lifts and escalators for platforms 5, 6 & 7

New interior layout for existing concourse with new lifts and stairs on platforms 3 & 4

Widening of platforms 5 & 6



2016

My QRA Fundamentally Challenged the Design of Int. Airport's Railway Station

*"Best QRA I've ever seen"*

- ECI Phase compared options, to find One that could fit the ridged budget

- Great Collaboration Effort





**2017**  
Power Law Assisted  
Program Level QRAs





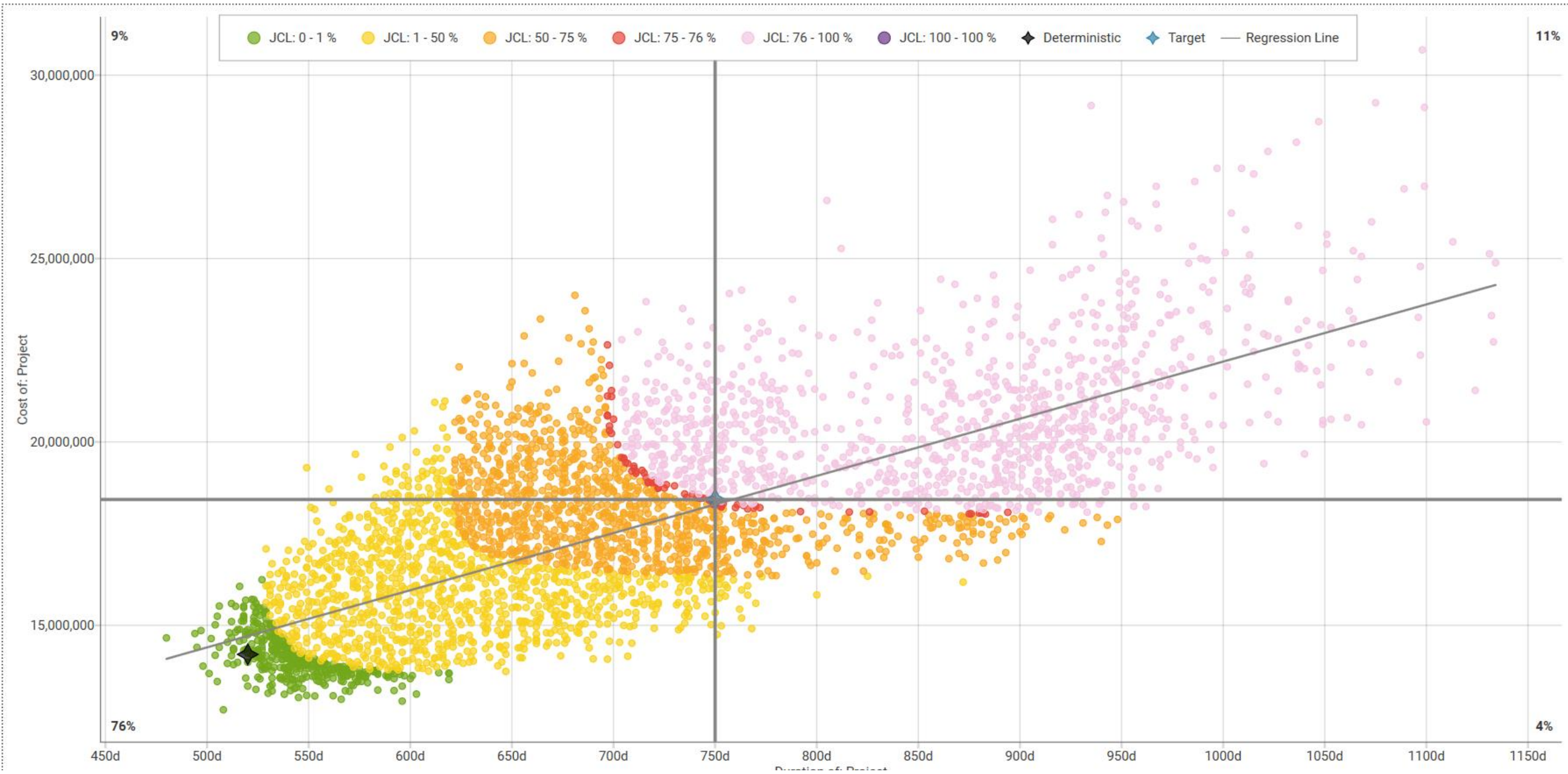
## 2018 “The Humbling”

- Learning the hard way  
That some innovations don't always  
scale-up!
- Making Mistakes is How we Learn





2019 Discovered Riskiest Works Package was a valid descope option



# 2019 Discovering Safran Risk's alternative approach to ICSRA with CBS + Introducing Joint Confidence Levels (JCL)



HOW MUCH YOU LEARN

FROM  
THEORY



FROM  
PRACTICE



FROM  
MISTAKES



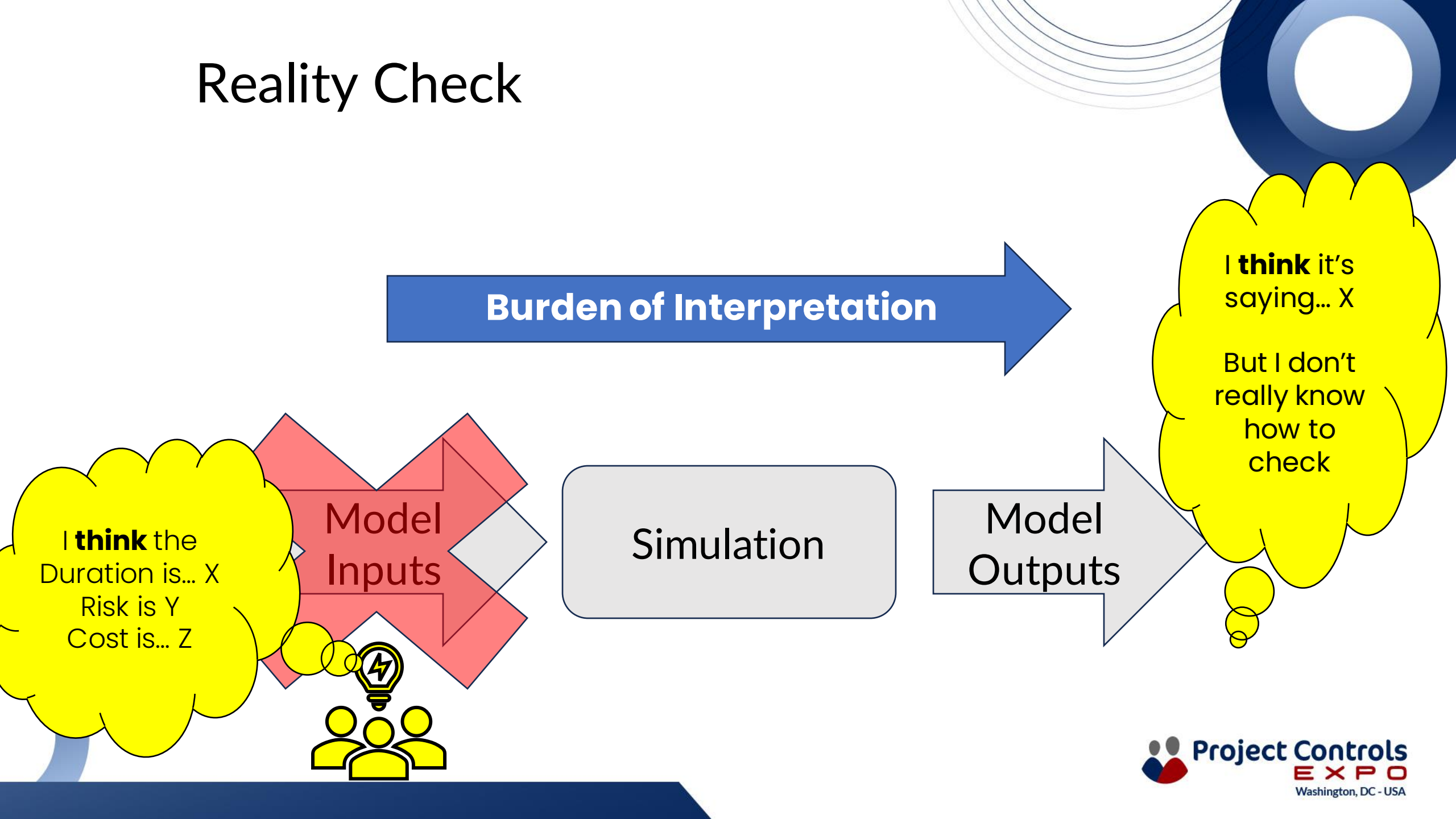
ROBERTOFERRARO.ART

How many of my highlights do you think a Forecasting Ai system would have helped?





# Reality Check





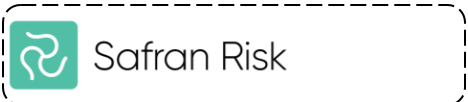
**Availability**

**Needs**

**QRA Use Cases**



# QRA - OUTCOMES

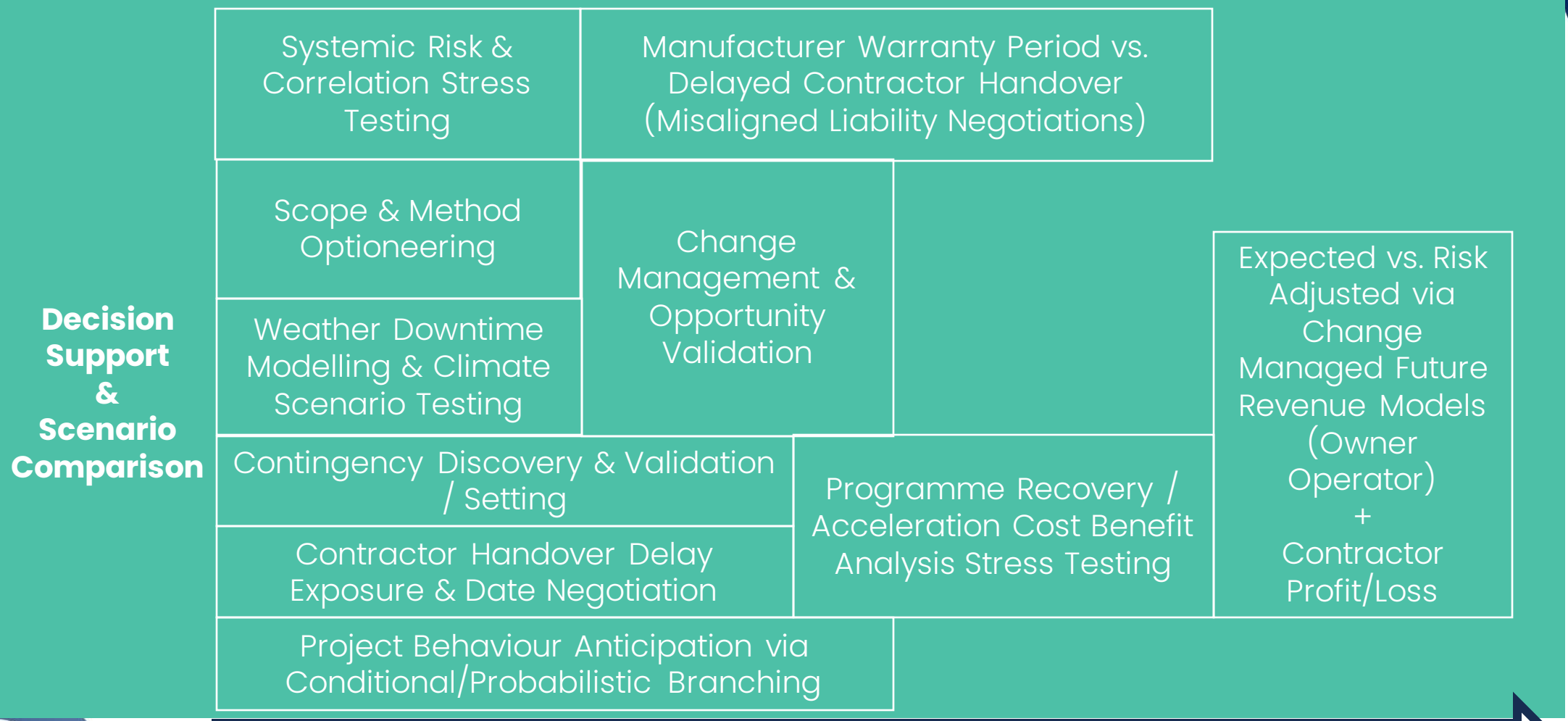


# QRA Use Cases

Forecasting



# QRA Use Cases



**Decision Support & Scenario Comparison**

Systemic Risk & Correlation Stress Testing	Manufacturer Warranty Period vs. Delayed Contractor Handover (Misaligned Liability Negotiations)	
Scope & Method Optioneering	Change Management & Opportunity Validation	Expected vs. Risk Adjusted via Change Managed Future Revenue Models (Owner Operator) + Contractor Profit/Loss
Weather Downtime Modelling & Climate Scenario Testing		
Contingency Discovery & Validation / Setting	Programme Recovery / Acceleration Cost Benefit Analysis Stress Testing	
Contractor Handover Delay Exposure & Date Negotiation		
Project Behaviour Anticipation via Conditional/Probabilistic Branching		

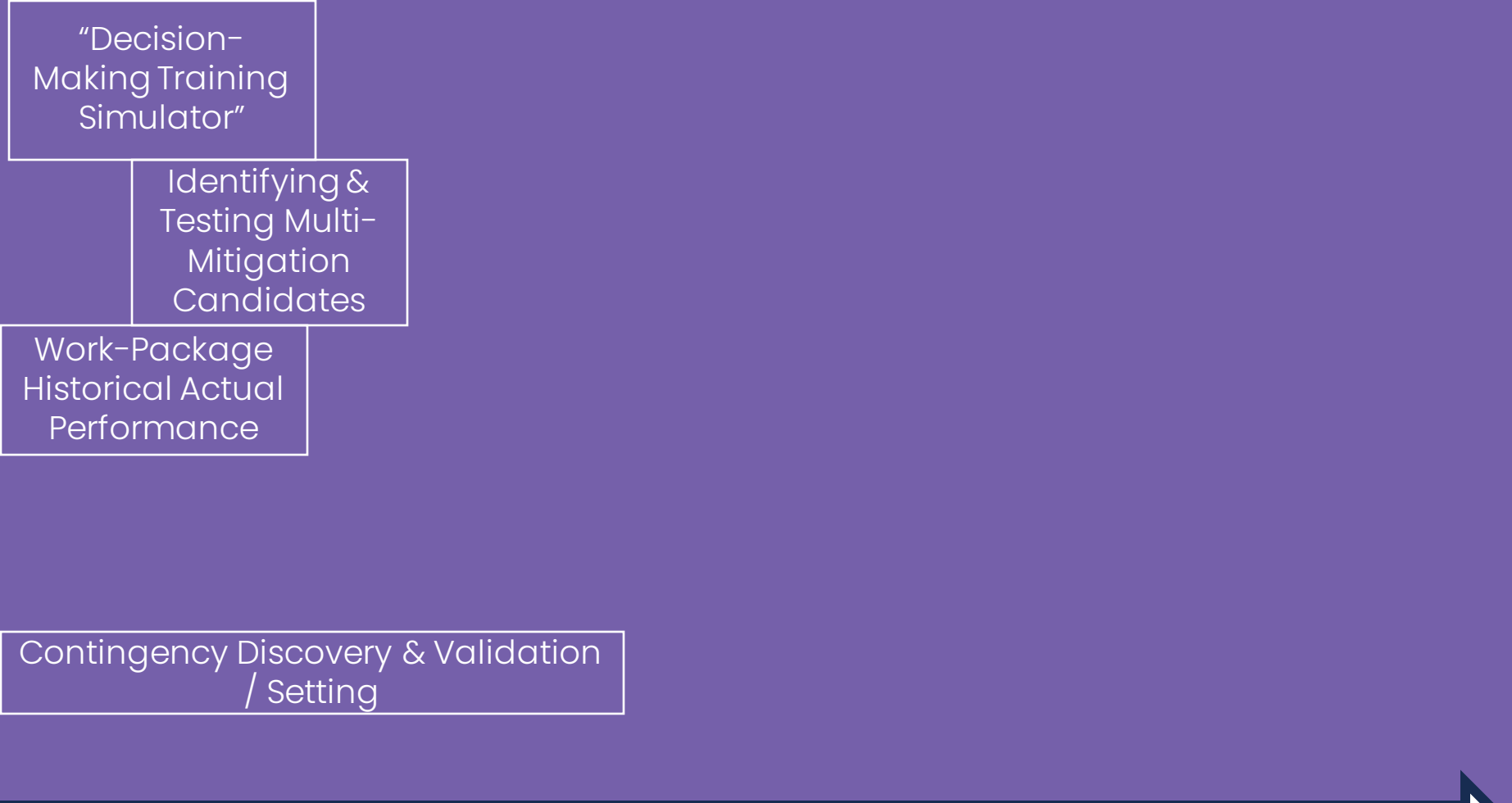


Project Phase / Lifecycle: Concept, Definition, Design, Build, Handover & Close-Out, Benefits Realisation



# QRA Use Cases

Quality Improvements & Insight Discovery



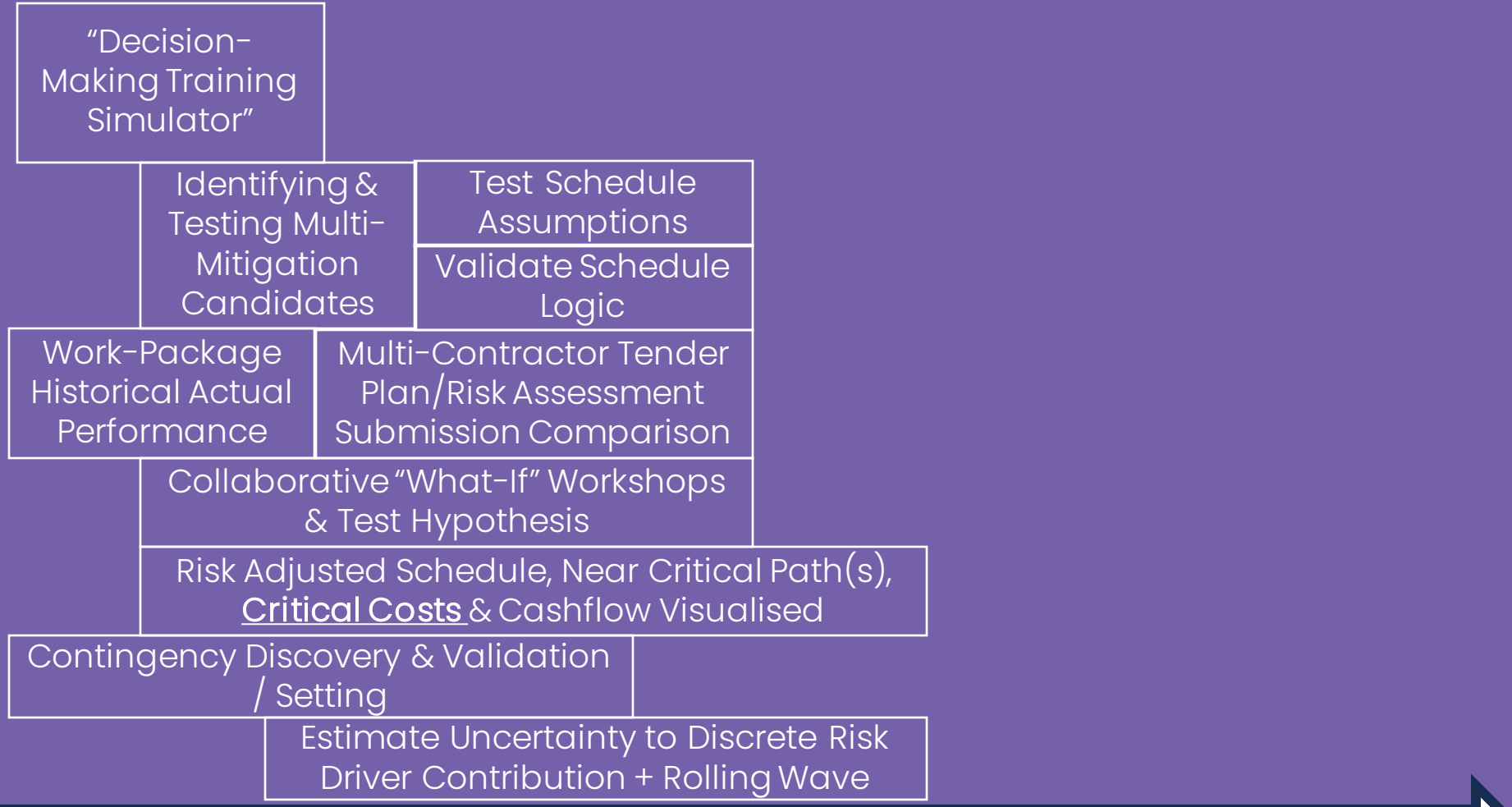
**Project Phase / Lifecycle**

Concept    Definition    Design    Build    Handover & Close-Out    Benefits Realisation



# QRA Use Cases

Quality Improvements & Insight Discovery



Project Phase / Lifecycle

Concept    Definition    Design    Build    Handover & Close-Out    Benefits Realisation





# QRA Use Cases



Quality Improvements & Insight Discovery



Concept

Definition

Design

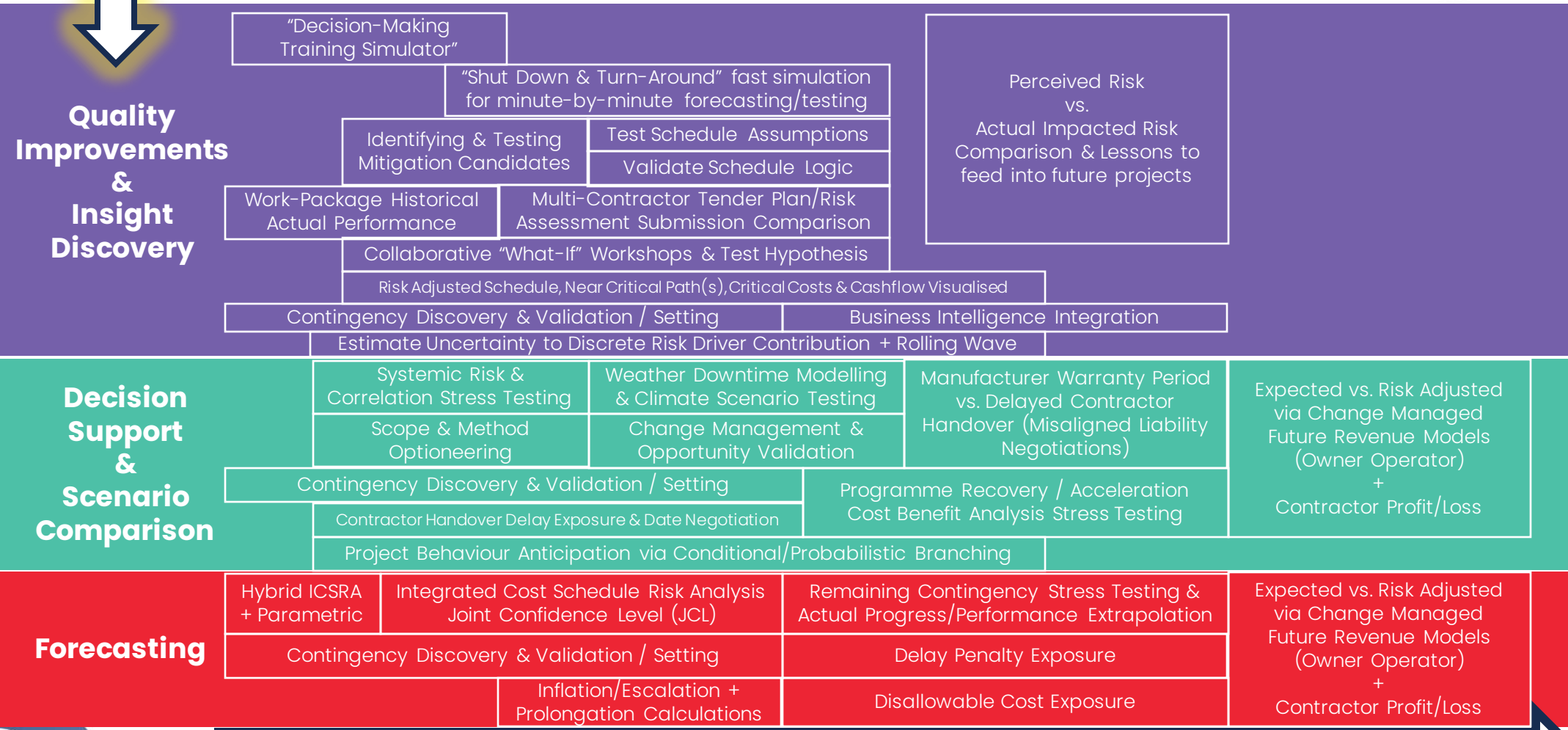
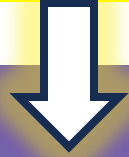
Build

Handover & Close-Out

Benefits Realisation



# OUTCOMES QRA Use Cases





# Batman Utility Belt

Because a regular belt's too mainstream



New  
Algorithmic  
Risk Analysis

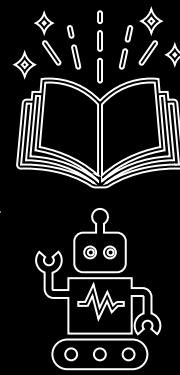
### FAST - Closed System



Raw  
Data



Data  
Processing



Are you Sure about  
Beep-Boop-Beep?

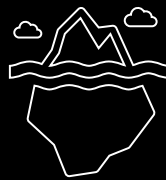


Low-Context Advice &  
Patterns Across More Things

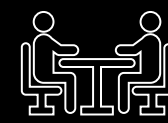
# ONE SIZE DOES NOT SIMPLY

Traditional  
Quantitative  
Risk Analysis

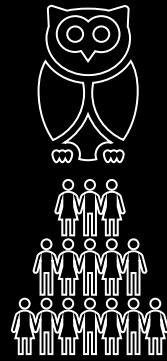
### SLOW - Open System



Flawed  
Data

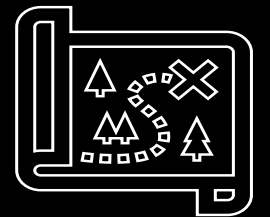


Opinion  
Processing



Then  
we'll do  
1, 2, 3

This will hurt /  
help because  
of X, Y & Z



High-Context Decisions On  
Specifically Fewer Things



# FIT ALL

## CONCLUSIONS

*All models are wrong  
but some are useful*

*This remains true of both  
Traditional QRA and Ai that's  
trained on poor quality  
inconsistent data*



George E.P. Box



## Key Take-Aways

- QRA can be used in more ways than most people realize.
- Ai (currently) only performs a fraction of what I've shown today
- More value hidden within the collaboration effort than the outcome
- Don't forget the humans in your future digital toolsets
- Don't discard one method at the expense of another, seek a blended approach to gain maximum advantage (eventually QRA will get Ai boost)
- Do what you can, with what you have! To answer specific, targeted questions. Help your colleagues with what matters to them!





**THANK YOU**

