Behind the Numbers: Unmasking the Estimators' Role in Project Success

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Agenda

Estimating Principles

What is an Estimate

P-Numbers

Estimating Linked Challenges and Possible Solutions

- Generic uncertainty & its application

- Estimating Function a silo

- Static Estimates

IPA Benchmarking Data Service

Summary

Estimating Principles

Clear ownership

There is **clear ownership and accountability** for the estimate

Right skills

The estimate requires **suitably qualified and experienced personnel** and a **collaborative environment**

Front-end loading

Investment to develop the project early on drives better outcomes and **enables more accurate estimates** at every stage

Appropriate method

The **appropriate estimating method** evolves across project stages

Risk-adjusted

The estimates are **risk-adjusted**, presented **clearly** and **consistently**, showing a **range** of possible outcomes

Evidence-based

Estimates are **transparent, robust and data-based evidence**

Reviewed and assured

Project teams use **review and assurance** to improve the quality of their estimate

Continuous improvement

An approach to **continuous improvement** is essential to **increasing the quality** of estimating practices and more generally

https://www.gov.uk/government/publications/cost-estimating-guidance
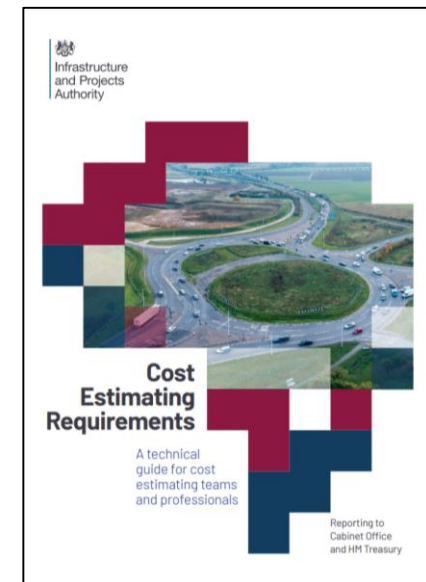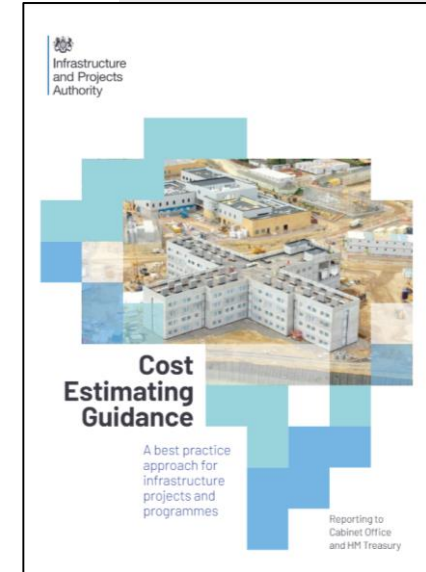
What's a reasonable Estimate?

- Well, it's not a Prediction
- Not Accuracy, but Precision & Robust
- Baseline estimate dependent on; Resource, Scope, Time & Data
- Updated with project, i.e. change in Scope and Data
- Uncertainty allocated at parameter level, using data and expertise
- Risk allocated appropriately. Perturb estimate elements to observe vulnerabilities
- Opportunities – as Risk, but not included in estimate proposal to avoid baking in unconfirmed efficiencies
- Comprises Evidence Trail / Basis of Estimate / Golden Thread / Line of Sight
- Traceable to Requirements and is Attributable
- Undergone Assurance and Governance
- Informed by internal and external stakeholders
- Has Robust & Assured Estimate Models
- MDAL maintained and considered/included in contract(s); at the very least, in the delivery team
- As objective as possible, considering biases (e.g. optimism, uniqueness, confirmation)
- Used to make informed decisions

What's an Estimate?

Some Challenges: P-Numbers

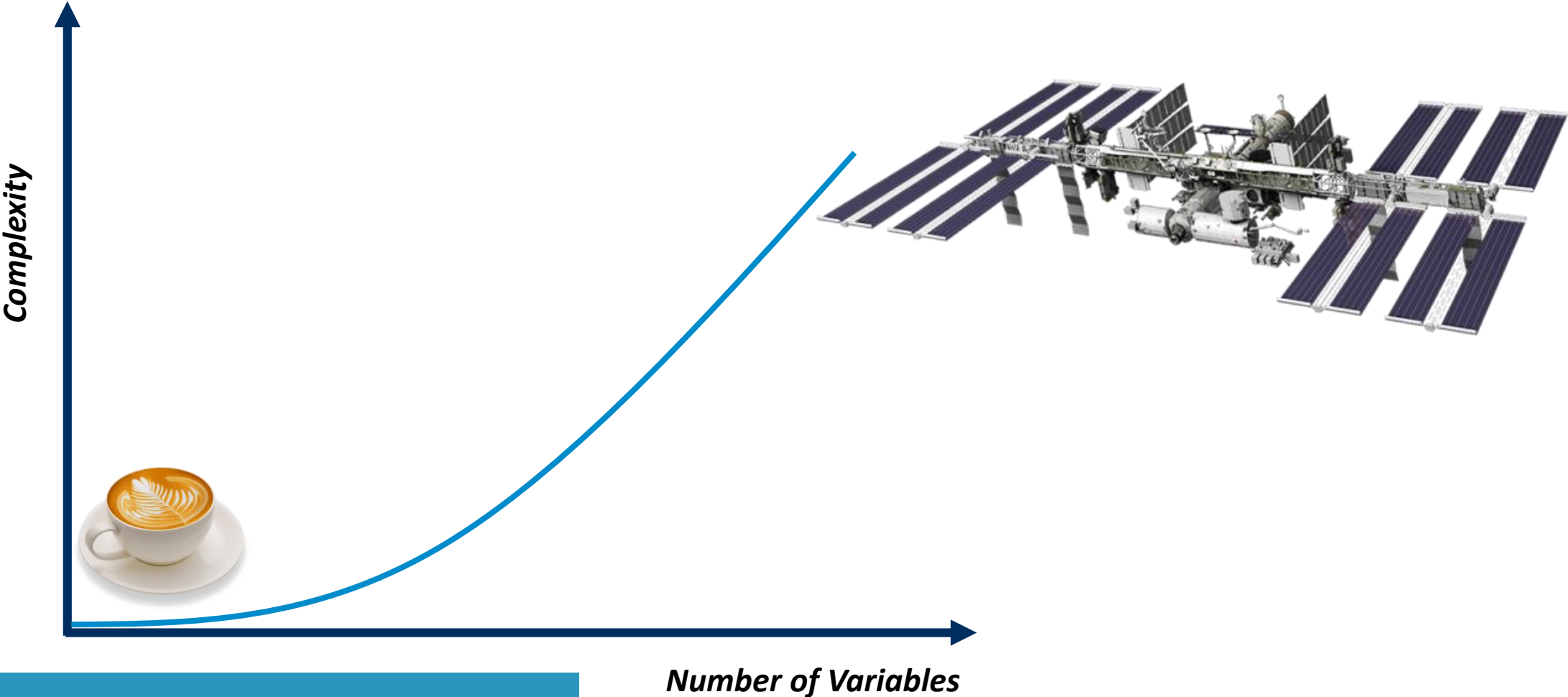■ What is a P50? Do all in Project Delivery Profession know these mean?
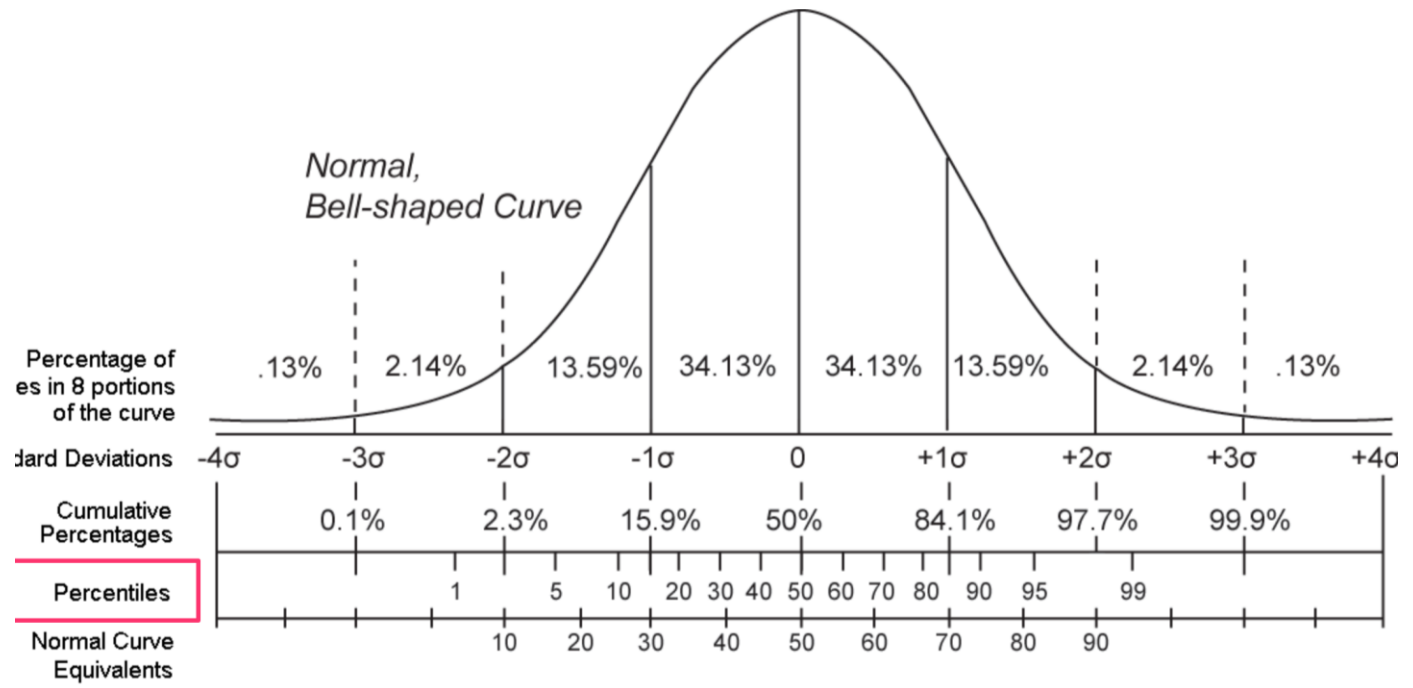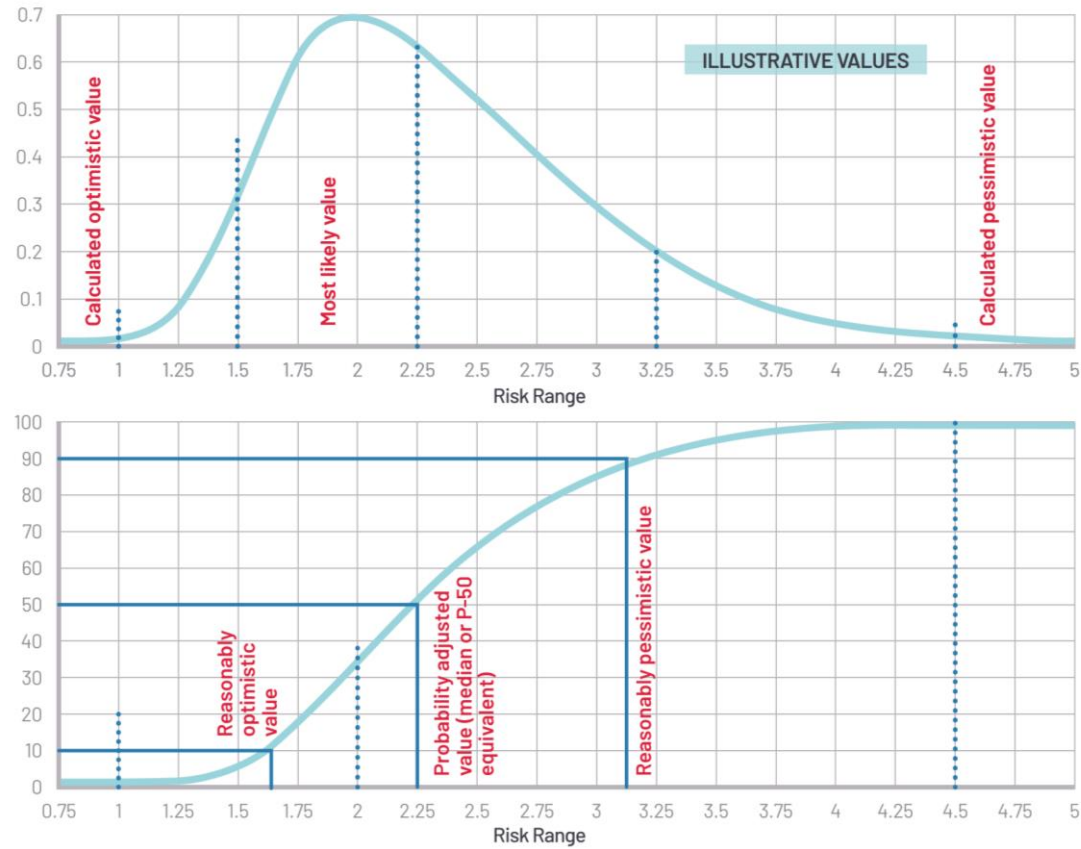
Some Challenges: P-Numbers (Rolling a pair of dice)

- 36 Possibilities
- P50?
  - ≤7
- Probability of rolling a 7?
  - 16.67%
- Consider a Major Project
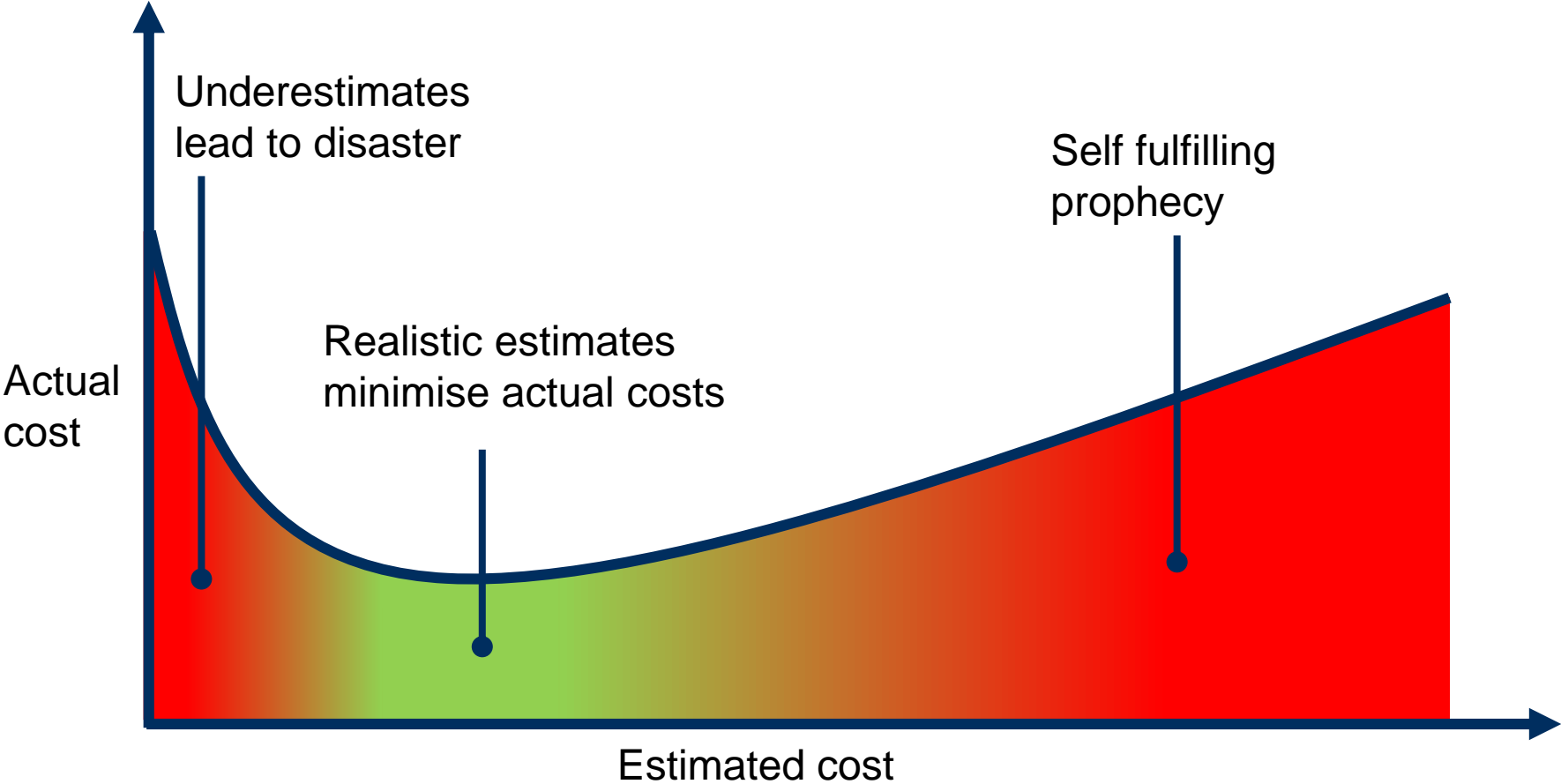 - How many possibilities?
  - What's the prob of 'rolling' the P50?

Project Complexity

Complexity

Number of Variables
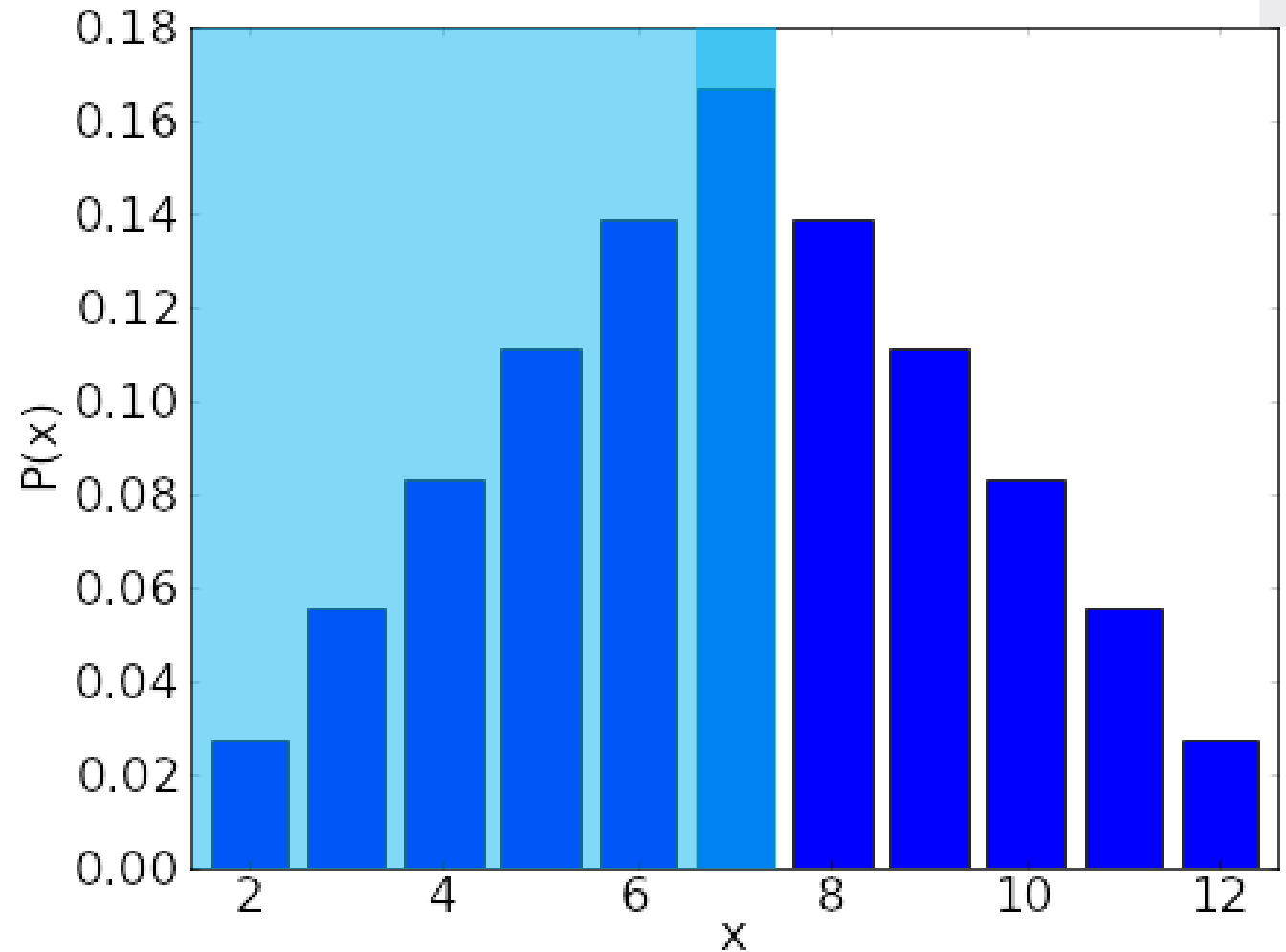
The Freiman Curve

Some Challenges: Top-Down Uncertainty

- Optimism Bias and similar top-down uncertainties applied to estimates: Should be used as **Benchmarks for comparison**
- Top Down uplifts (like OB and RCF) can be informative, but limitations need to be factored
  e.g. Averages, Distracts from developing scope maturity, Stifles innovation and Disincentivise data collection, Reduces accountability

#%

μ#%

Cost Estimate   Actual Cost

Projects A to n-1

Cost Estimate   Revised Estimate

Project n
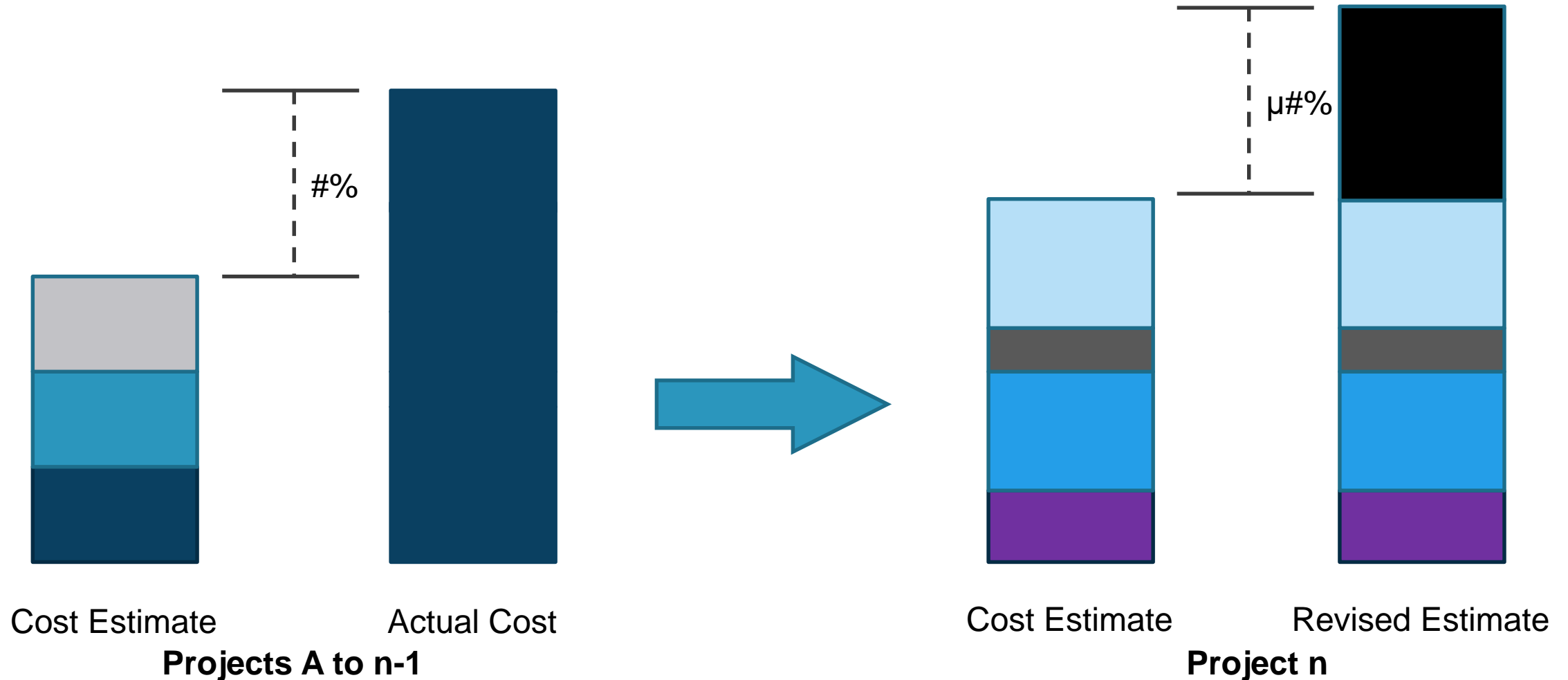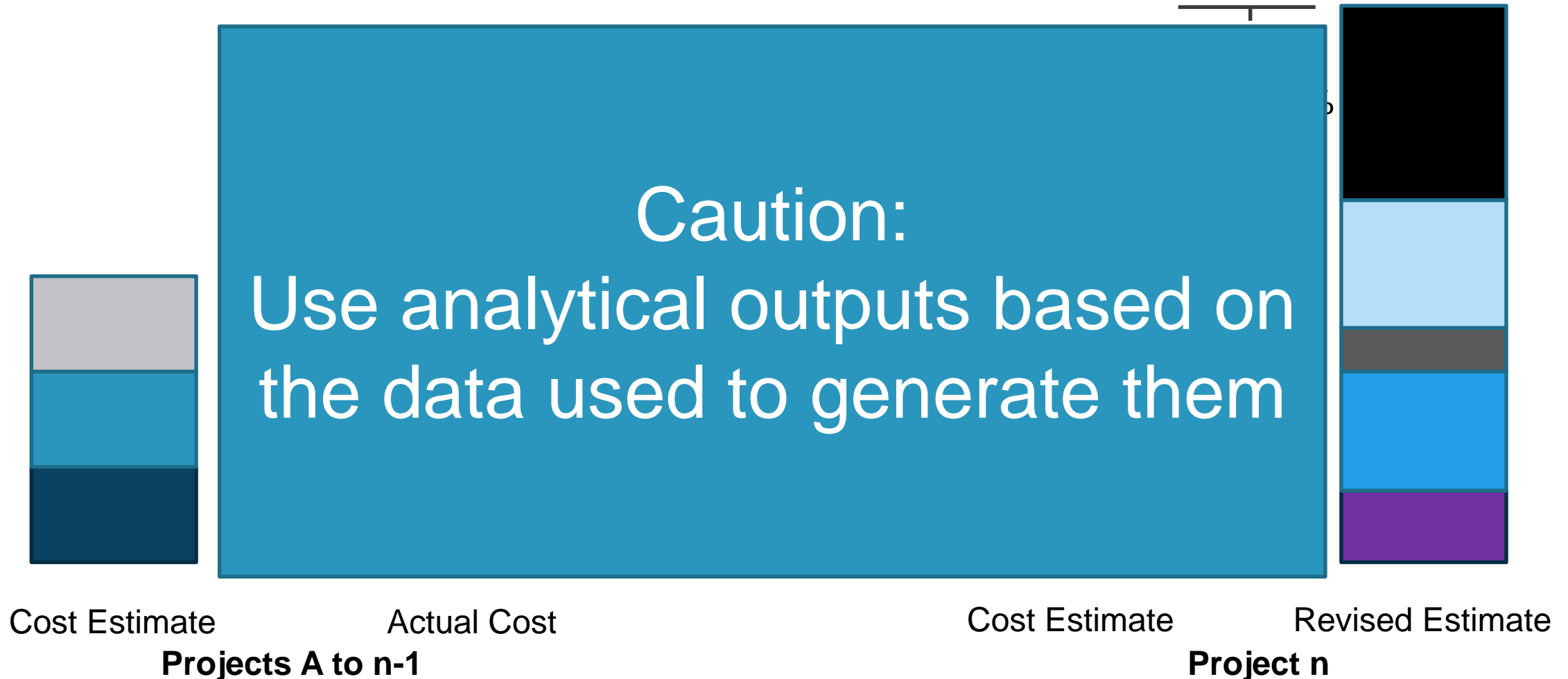
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Caution:
Use analytical outputs based on
the data used to generate them

Cost Estimate   Actual Cost   Cost Estimate   Revised Estimate

Projects A to n-1   **Project n**

Some Challenges: Top-Down Uncertainty – How we Address

Project Maturity
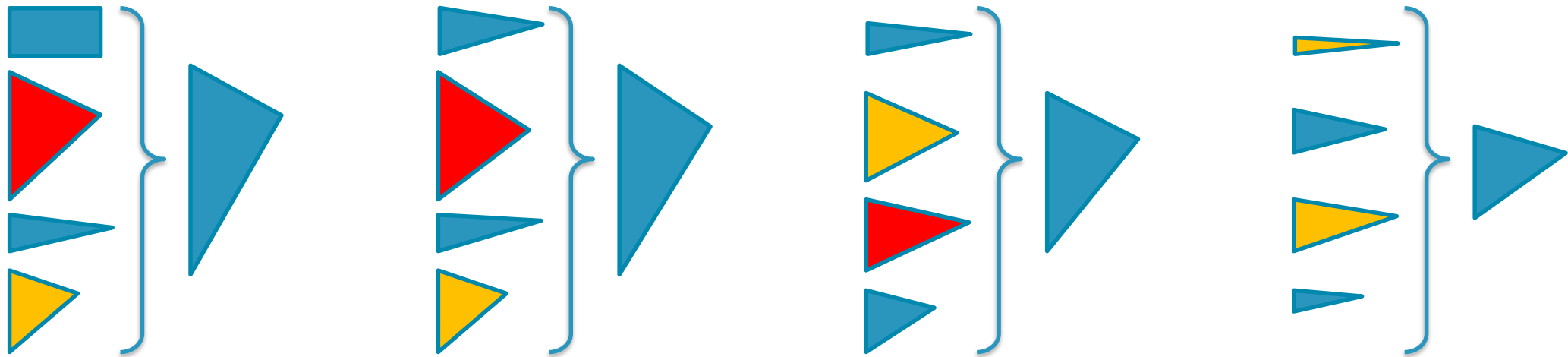
- Increased confidence with available scope, data and new information
- Capturing and Implementing lessons learned
- Increasing communication content and context with senior leaders and decision makers

Some Challenges: Integrating the Estimating Function

- Estimators are intensely involved at appraisal, then intermittently (possibly) but usually when Actuals exceed the Estimate
- The Estimator Voice should be in room, not just their numbers
- **Integrating with Project Delivery (e.g. Commercial, Finance, PMO, Supply Chain, Project Controls)**

- We need Estimators to account for the changes in:
    i. Scope
    ii. Interaction with external aspects (e.g. regulations, socio-economic conditions, supply chain). Feedback.
    iii. Impact on future (e.g. operational conditions, public, benefits, social value)

- New Year Resolutions: Interventions towards Improvement
- How many set them at the start of this year?
- How many have maintained them?
- How many have changed them?
    i. Scope – Setting the goals too high, we calibrate them. Address for next iteration. (Models)
    ii. Access to what we need for optimal adherence. Planning what we need to do and how will achieve. Asch conformity. (Model map and links)
    iii. Track, linking it to purpose and using the appropriate metrics, priorities for which can change over time (e.g. taste prioritised over nutrition)

Some Challenges: Integrating the Estimating Function – How we Address

- Estimator Roles are now recognised in the Project Delivery Capability Framework (Government Project Delivery Profession)
- Developing a new British Specification Standard on Estimating
- No one is saying this is easy but it will not always be difficult and the outcomes are more likely to deliver greater value

Some Challenges: Integrating Estimating Through Life & Beyond

- Estimating should be engaged throughout a project, with estimates as a Living Document
- Considerable insights can be gained from project feedback
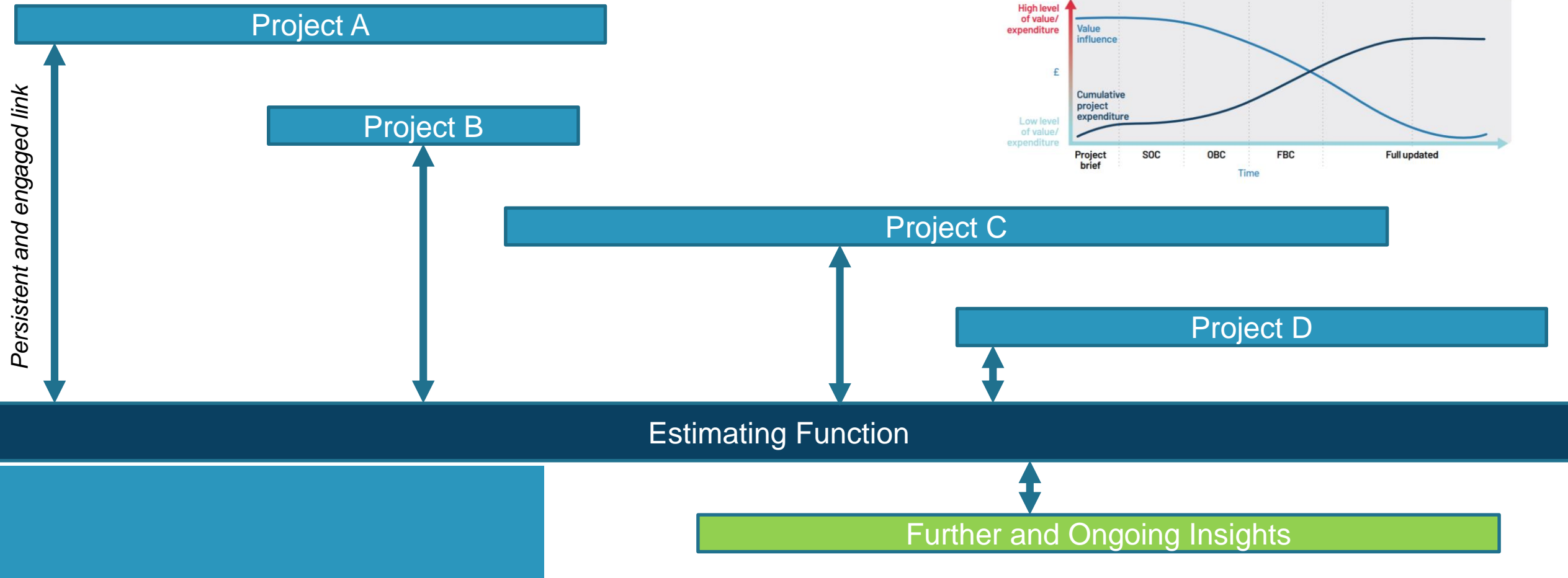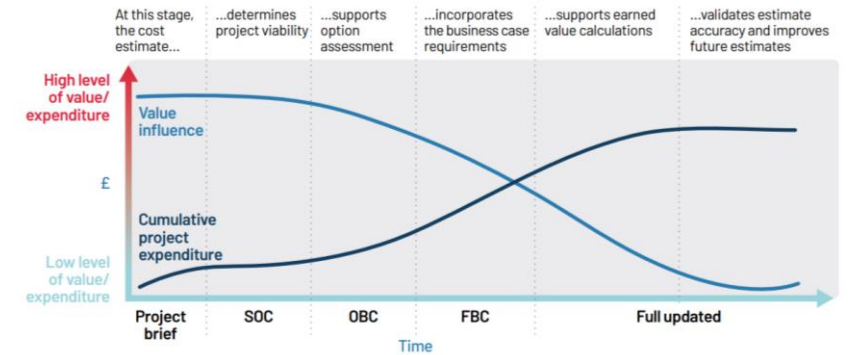- Project learning should be embedded
- How can we address this?

Project A

Project B

Project C

Project D

Persistent and engaged link

Estimating Function

Further and Ongoing Insights

Figure 2 – The importance of setting the project up for success

Some Challenges: Integrating Estimating Through Life & Beyond

- Estimating should be engaged throughout a project, with estimates as a Living Document
- Considerable insights can be gained from project feedback
- Project
- How ca

Persistent and engaged link

...supports
...ption
...ssessment

...incorporates
the business case
requirements

...supports earned
value calculations

...validates estimate
accuracy and improves
future estimates

...g the project up for success

OBC   FBC   Full updated

Time

Playing the finite game AND the infinite game
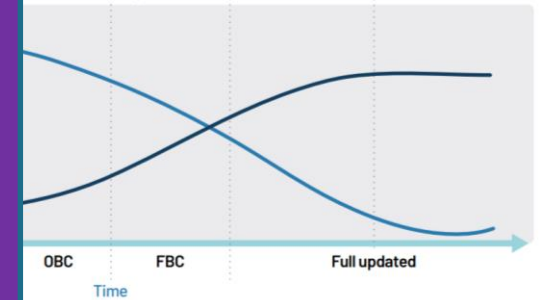
Project D

Estimating Function

Further and Ongoing Insights

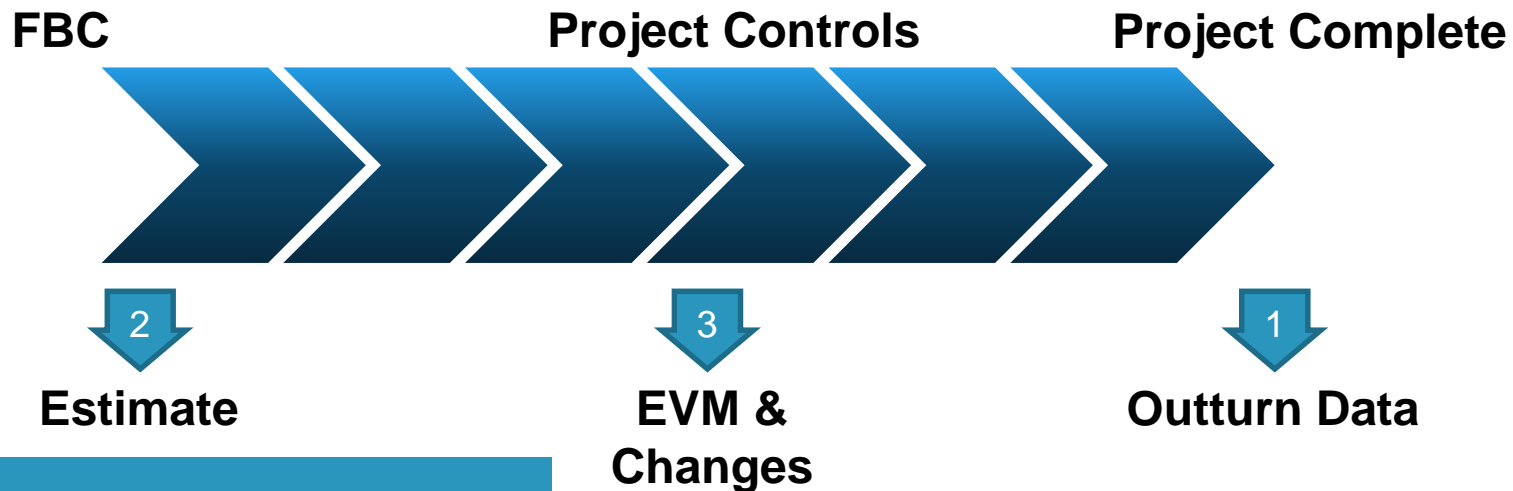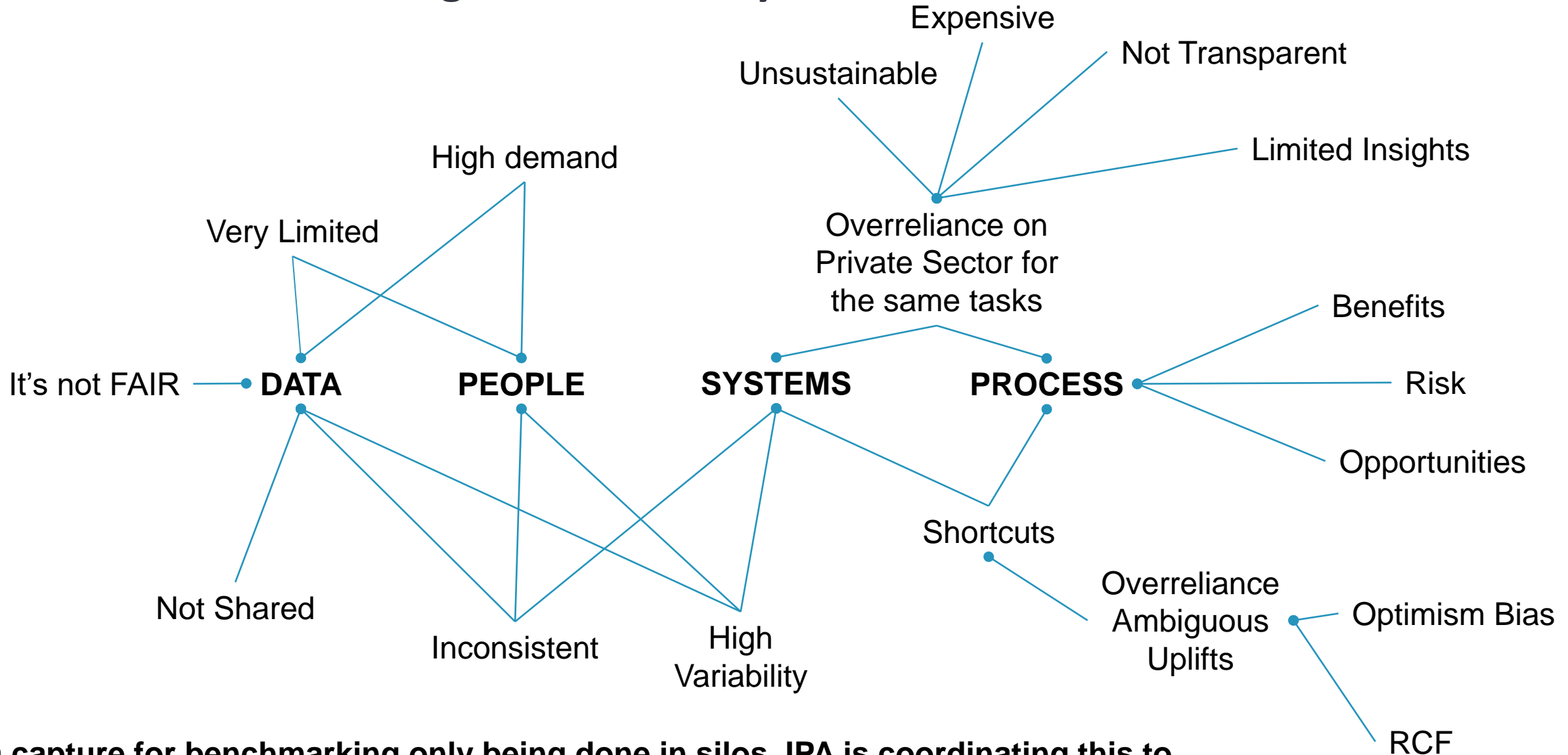# IPA Benchmarking Data Service: Key Objectives

- Sharing Project Data
- Informed Data Analytics
- Improve (Project) Data Management (and Consistency)
- Connecting Government: Optimising Information Availability

FBC **Project Controls** **Project Complete**

2 **Estimate**

3 **EVM & Changes**

1 **Outturn Data**

Evolving:
- Coverage
- Depth
- Granularity

Infrastructure and Projects Authority

The issues and challenges we currently face

Expensive

Not Transparent

Unsustainable

Limited Insights

High demand

Very Limited

Overreliance on Private Sector for the same tasks

Benefits

It's not FAIR — **DATA** · · **PEOPLE** · **SYSTEMS** · **PROCESS** · Risk

Not Shared

Opportunities

Inconsistent

High Variability

Shortcuts

Overreliance Ambiguous Uplifts

Optimism Bias

RCF

Data capture for benchmarking only being done in silos. IPA is coordinating this to develop better benchmarks through data collaboration.
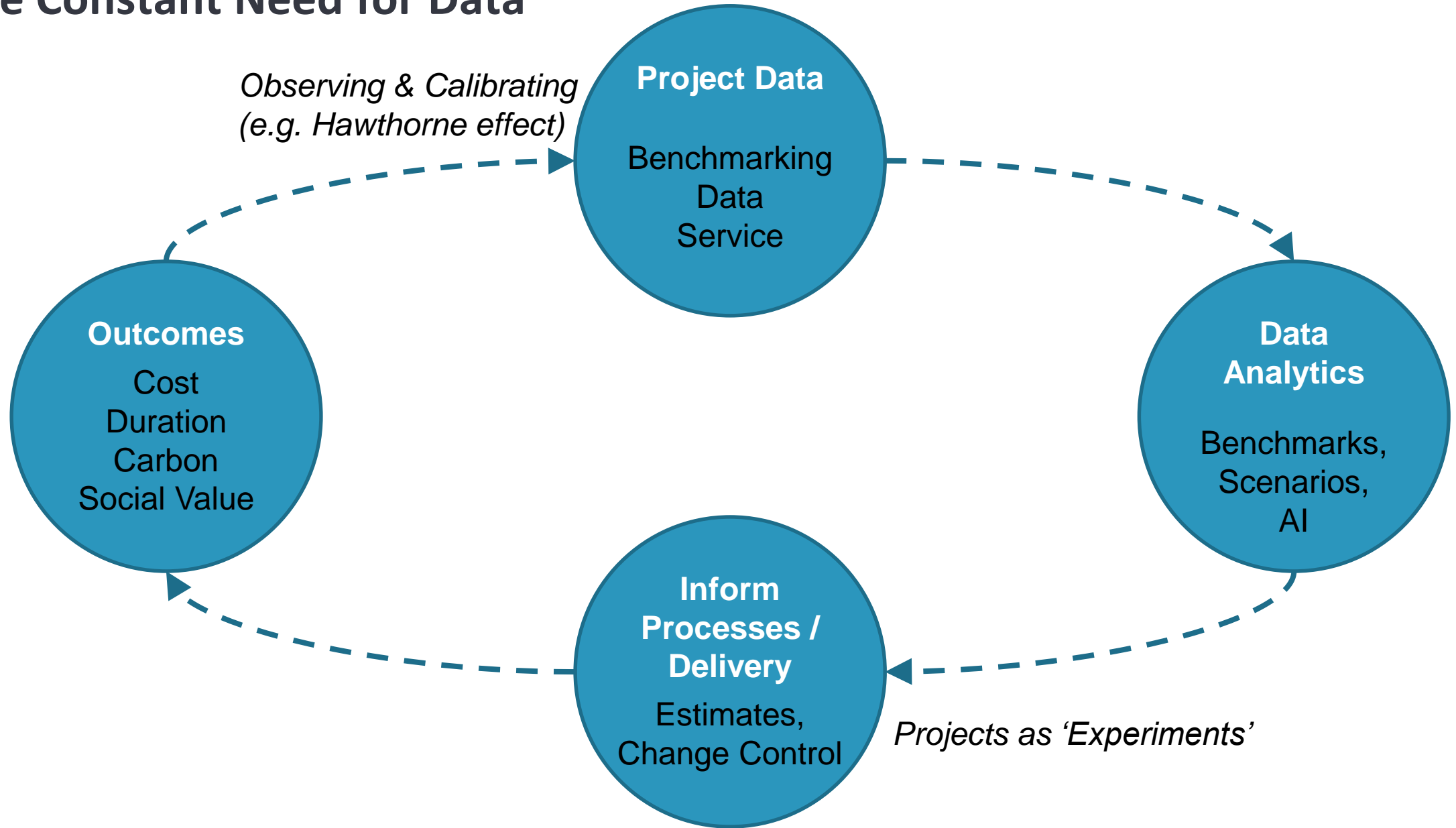
IPA Benchmarking Data Service

■ A strong focus on metadata across the project lifecycle

UK Government Departments and Public Bodies

Data Acquisition from the Private Sector

Non-UK Governments

PROJECT DATA

Standard · Structure · Quality · Classification · Definition · Provenance

Acquisition · Maintenance · Assurance · Access · Storage · Governance

Continuously Evolving by Responding to stakeholder Needs

e.g. Pavement (£/km)

μ

Location
Site conditions
Type of road
Number of lanes
Structures
Materials
Environment
Utilities
…

The Constant Need for Data

In Summary

The Numbers

- Don't fixate too much on the 'One' number solely, but the reasoning, estimate range and scenarios
- Beware of averages
- It's ok to Not to Know precisely. Use uncertainty as a key decision driver.
- The only thing that is certain: Change
- Engage and inform decision makers

The Estimator

- Integrate the Estimating Function into Project Delivery (as a minimum). Greater and more informed collaboration.
- Implement Lessons Learned to minimise repeating mistakes

Live Estimates

- Encourage estimates to become Live Documents and inform other areas of a project, organisation and government
- Remember you're playing finite and infinite games. Losing track of the latter will likely result in degradation in long term value.

Accessible Project Data

- Collect the relevant data to gain insights to contribute positively to future projects and decisions

Other crucial things to consider:

- Optimism Bias
- Parkinson's Law
- Belief Preservation
- Things are rarely black and white: May be better to think about consequences, not simply good or bad
- Hindsight Bias (Lottery Numbers)
- Framing correctly with clear communication, particularly when numbers are involved (e.g. David and Goliath)
- Hopefully you are more likely to stick to your (New Year) resolutions

Thank you

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