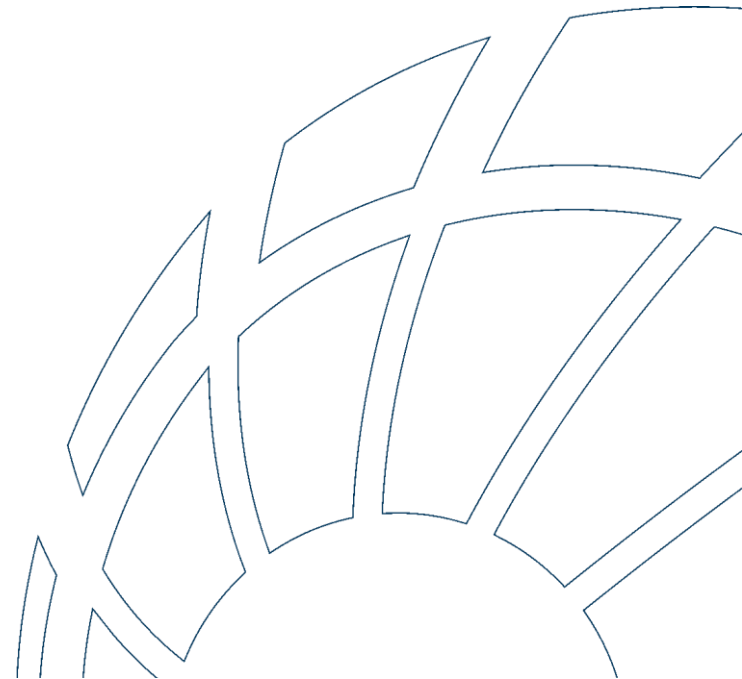




# **Cost Modelling: Integrated Cost and Schedule**

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**4<sup>th</sup> June 2013**



# BMT Group

- An international network of subsidiaries providing engineering, design and risk management consultancy
- Wholly independent partner providing customers with access to expertise around the globe
- Heritage of research and technology which drives significant ongoing investment in R&D and development of future talent
- Formed in 1985 through Government privatisation of maritime research and technology organisations
- Held in beneficial ownership for the staff
- 2012 turnover £156 million
- 1400 staff in 25 subsidiary companies (40 Offices) in 24 countries in Europe, North America and Asia



# BMT Hi-Q Sigma Overview

- A professional services company comprising of 130 consultants across offices in Bath, Micheldever and London.
- Operating across the Defence, Energy and Transportation sectors.
- Achieved a turnover in 2012 of ~ £13M.
- As an employee benefit trust with no manufacturing or supply chain interests, we provide truly impartial advice, assistance.
- In the complex world which we know you face every day, our goal is simple and steadfast:

**to bring clarity**

# BMT Hi Q Sigma Services and Capabilities

- We help to deliver complex programmes through the integration of programme management and systems engineering.

We help you achieve clarity through:

- **Strategic guidance** to organisations in the establishment and management of programmes
- Interventions to **optimise existing programmes/projects**
- Provision of quality people as **interim support**



# Aim

This presentation will discuss the Confidence Limits that are used to aid decision making in projects. It will also explore some of the options for combining schedule and cost models to give a project the best chance of success.

In this presentation we will also discuss the 'softer' issues that can lead to project failure.

# Agenda

1. Differences between Cost and Schedule Models
2. Top 10 v most significant risks
3. What actually happens
4. Options for modelling Cost and Schedule
5. Which Option to choose?
6. Softer Issues
7. Benefits of working together
8. Questions

# Differences between Cost and Schedule Modelling

- Uncertainty – described using a 3 point estimate (3PE) and has 100% probability; you know there will be a cost, but it will fall within the 3PE.
- Risk/Opportunity – described using a 3PE for impact and has a chance that it may or may not happen; the probability is less than 100%.

	Cost	Schedule
Typical MicroSoft office tools used	Excel; Access	Project
Addition of Uncertainty and Risk	Simulation – Add uncertainty and risk as two separate groups	Simulation – Add risks to individual uncertainty tasks (as appropriate)
Magnitude of Risks	Combination of probability and Impact	Criticality and/or Cruciality

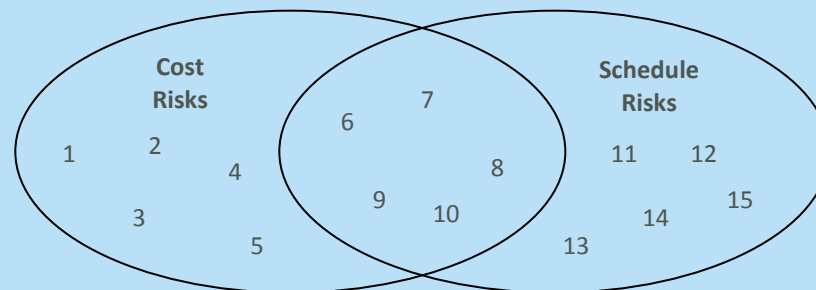
# Top 10 v most significant

Terminology has changed in recent years:

Previously – we spoke about “modelling the top 10 risks”

Now – we speak about “modelling the most significant risks”

This change is due to the use of Schedule Risk Analysis and the difference between measuring the magnitude for cost risks and the use of criticality and cruciality for a schedule risk



**Most significant project risks**



# Do you recognise this?

A Work Breakdown Structure is developed

Costs estimates are assigned to the various elements

To ensure funding is available at the correct time, questions are asked about when the activities will take place

A schedule is developed and the timescales are taken from that schedule and put in the cost model

Therefore the cost model is developed using schedule dates (50%?)

Schedule updated

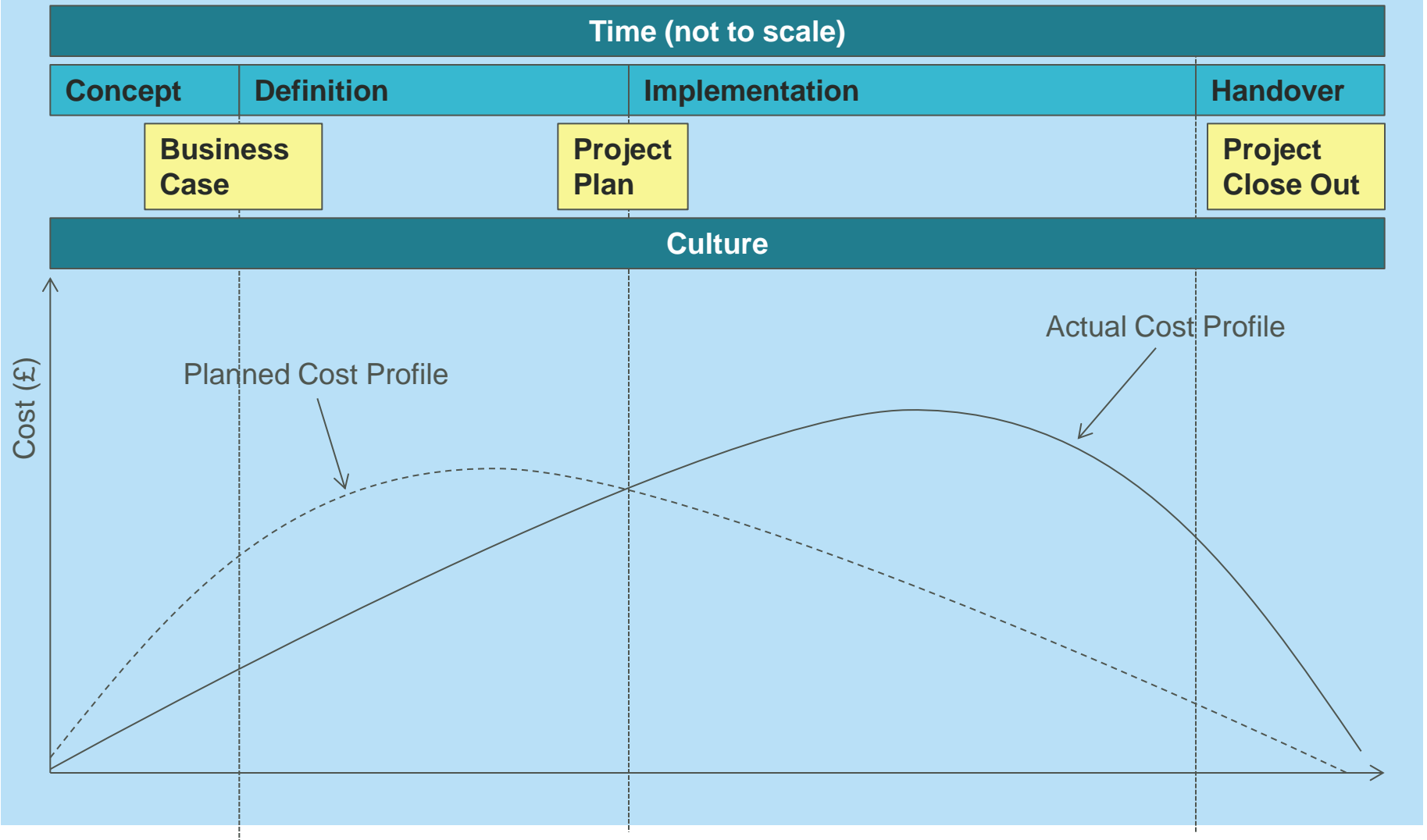
Schedule updated again

Schedule updated again

All this time the cost model remains unchanged and it no longer reflects the latest schedule

The results look like ....

# Project Activities



# Why does this happen?

Poor project/programme management?

Perhaps

Bad luck?

In some cases

Poor estimating?

In some cases

Capital rationing – not enough budget available (on time)?

Could be

Lack of realism?

More than likely

Lack of understanding of what is actually being modelled?

In most cases

By PM?

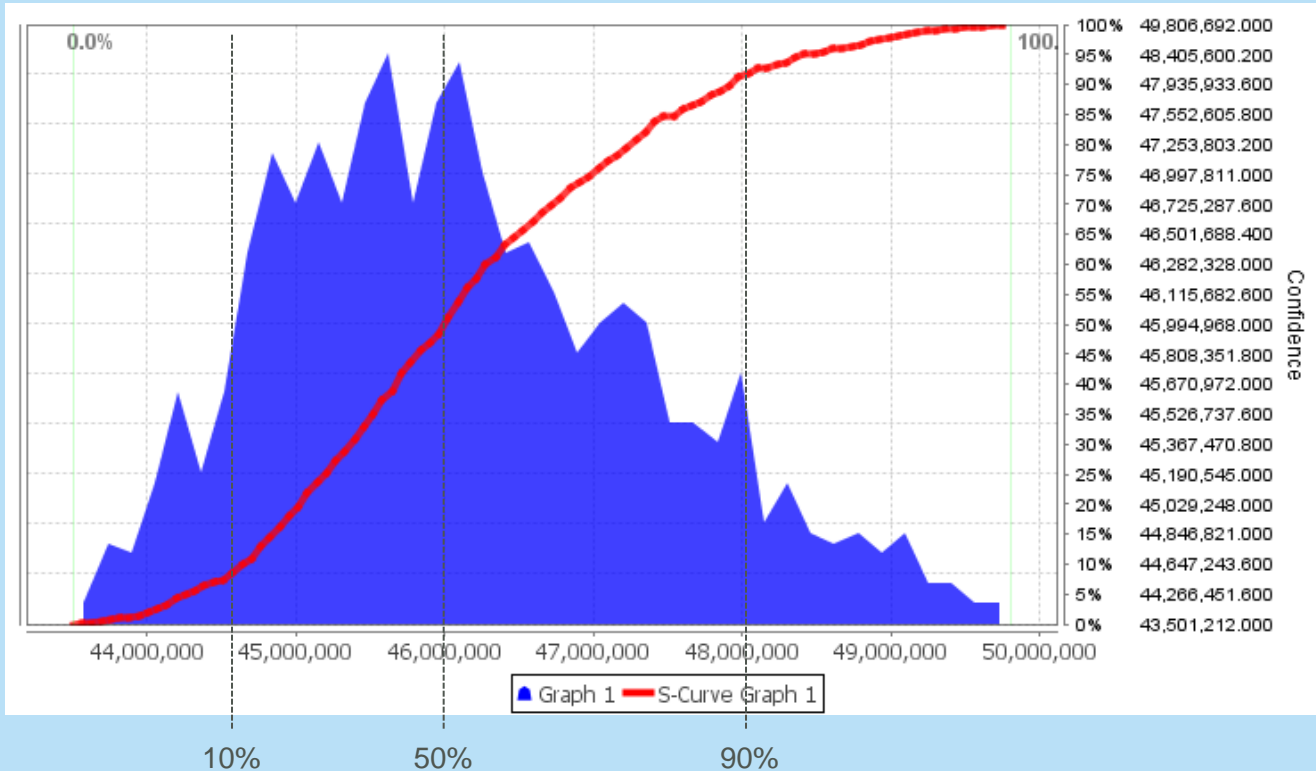
Some of the time

By External Project sources (eg Finance/Commercial Departments)?

Most of the time

Why? ...

# Confidence Limits



What confidence limit does your company use from the Schedule? 50%?

What confidence limit does your company use from the Cost? 50%?

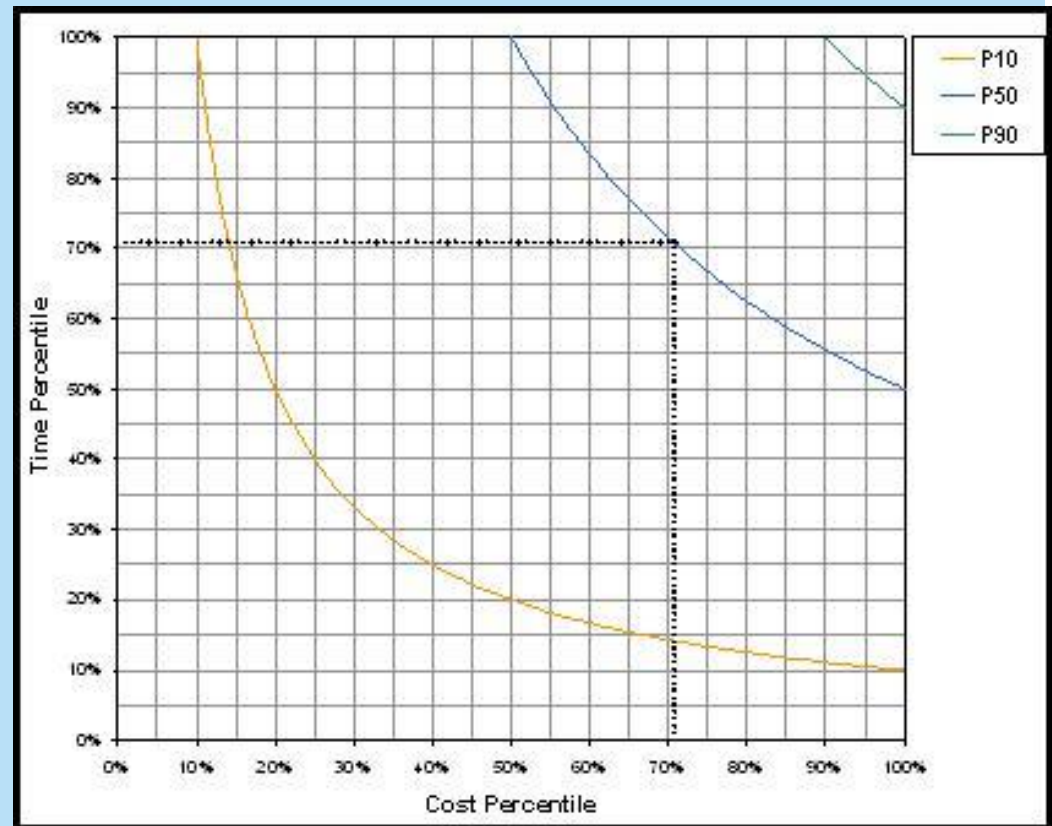
Does this sound sensible?

# 50% Confidence Limits?

## 50% Cost Confidence Limit at 50% Schedule Confidence Limit

In the uncorrelated case, there is only a 25% Confidence Limit of meeting both (i.e.  $0.5 \times 0.5 = 0.25$ )

To achieve the overall 50% confidence limit of 2 independent variables will require the 71% confidence limits for both time and cost to be used



# Possible Options?

**Depends on the cost model and schedule that you have already, i.e. what you have to start with.**

Do you have a Cost Model?

Do you have a Schedule?

Do you do Timescale Risk Analysis?

## **Options:**

- 1 – Continue with the information you already have.
- 2 – Build a cost model for each of the schedule confidence limits you want to use.
- 3 – Develop a cost model and schedule in a dedicated tool.
- 4 – Develop a cost model and schedule in a tool such as MS Excel.

# Options

- **Option 1** – Continue with the information you already have
  - You may not be optimising the information you are using?
- **Option 2** – Build a cost model for each of the schedule confidence limits you want to use
  - If you run a TRA and cost model already, then this will require minimum change.
  - For example, produce three cost models based on 10%, 50% and 90% dates from the TRA results.
  - May be adequate for what is required.
- **Option 3** – Develop a cost model and schedule in a tool dedicated to this purpose
  - May require licences to be bought (high cost?).
  - Cannot be read by stakeholders who do not have a licence (additional cost?).
  - May require extra training (additional cost?).
- **Option 4** – Develop a cost model and schedule in a tool such as MS Excel
  - Can be read by many stakeholders.
  - Transparent
  - Low licence costs.

# Which Option to choose?

## Depends on:

Project

Organisation/Company

Project Manager

Data available

Skills available

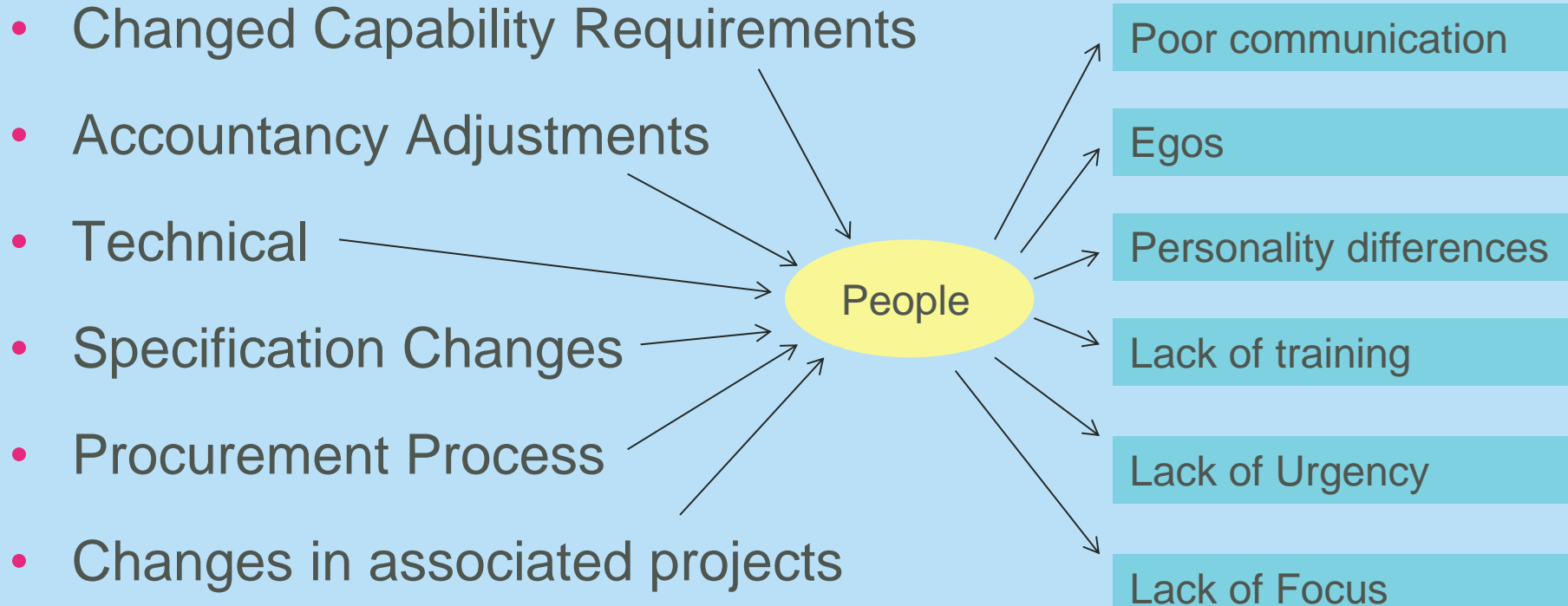
**What would you use?**

**What would your Organisation/Company allow you to use?**



# Softer Issues

## Why do projects fail?



# People

- **Imagine an office with 4 corners**
  - Risk, Cost, Schedule and EVM in each
  - A field force in the middle
  - No one crosses the room to talk to each other (about work)
- **Your working environment**
  - Assuming you are mainly cost modellers
  - When was the last time you talked to your schedulers
  - Did their WBS/PBS match your Cost Breakdown Structure?
  - What did you do about these differences?

# Benefits of working together

- Better understanding of common stakeholders
- Build on culture change as the project progresses
- Reduces stakeholder engagement time
- Improved communication
- Costs developed using manhours can be used to develop schedules (*vice versa* in the next project)
- Reduces the overhead of project planning (robust data available)
- Feedback loops can be used to make the cost model, schedule and Performance Measurement Baseline more robust on follow on projects
- Helps build a robust database of project data

**Thank you**

