QUANTUM GLOBAL SOLUTIONS

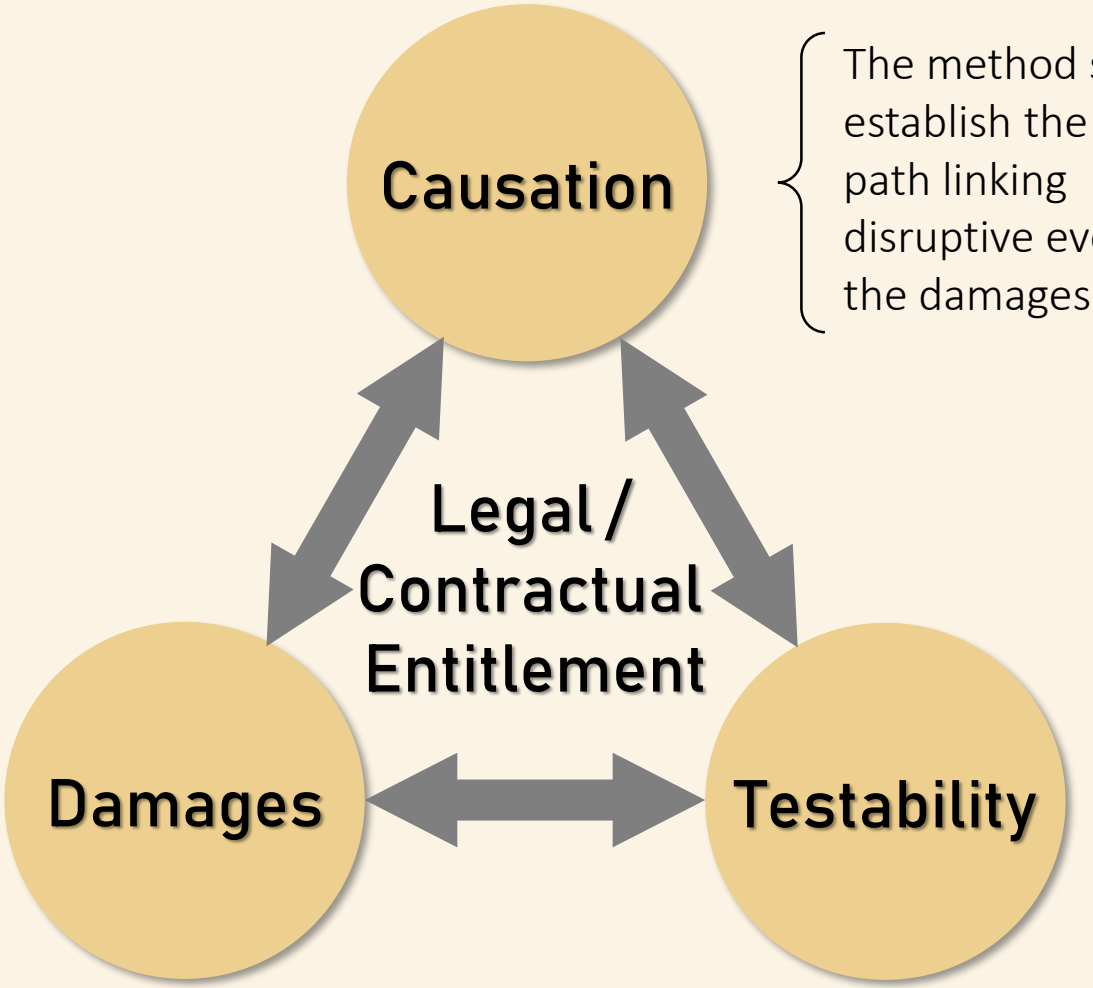
Construction Dynamics Solutions

System Dynamics

EIC EUROPEAN INTERNATIONAL CONTRACTORS

A quantum leap in the recovery of construction disruption costs

Three hurdles to entitlement

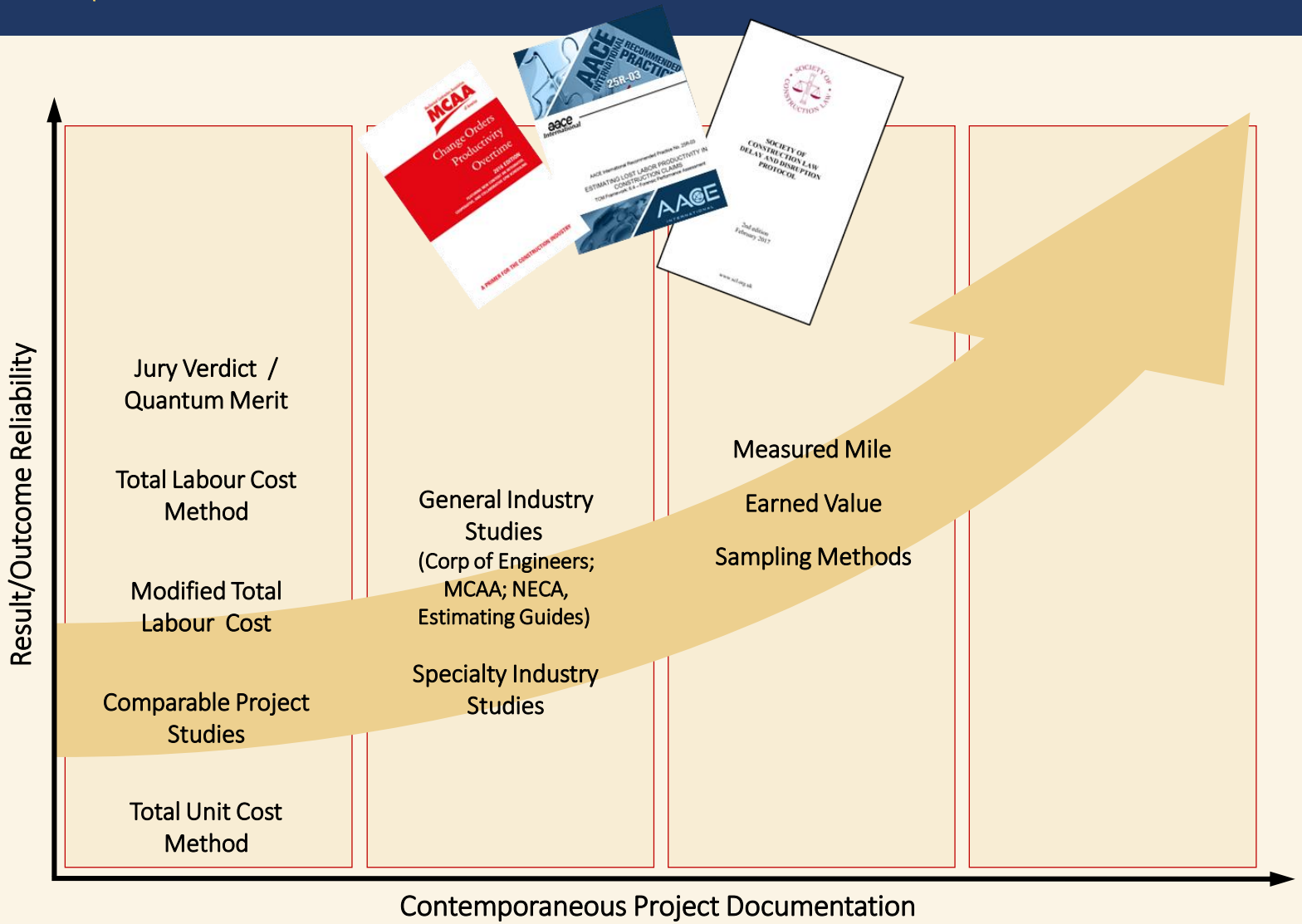


The method should establish the causal path linking disruptive events and the damages caused

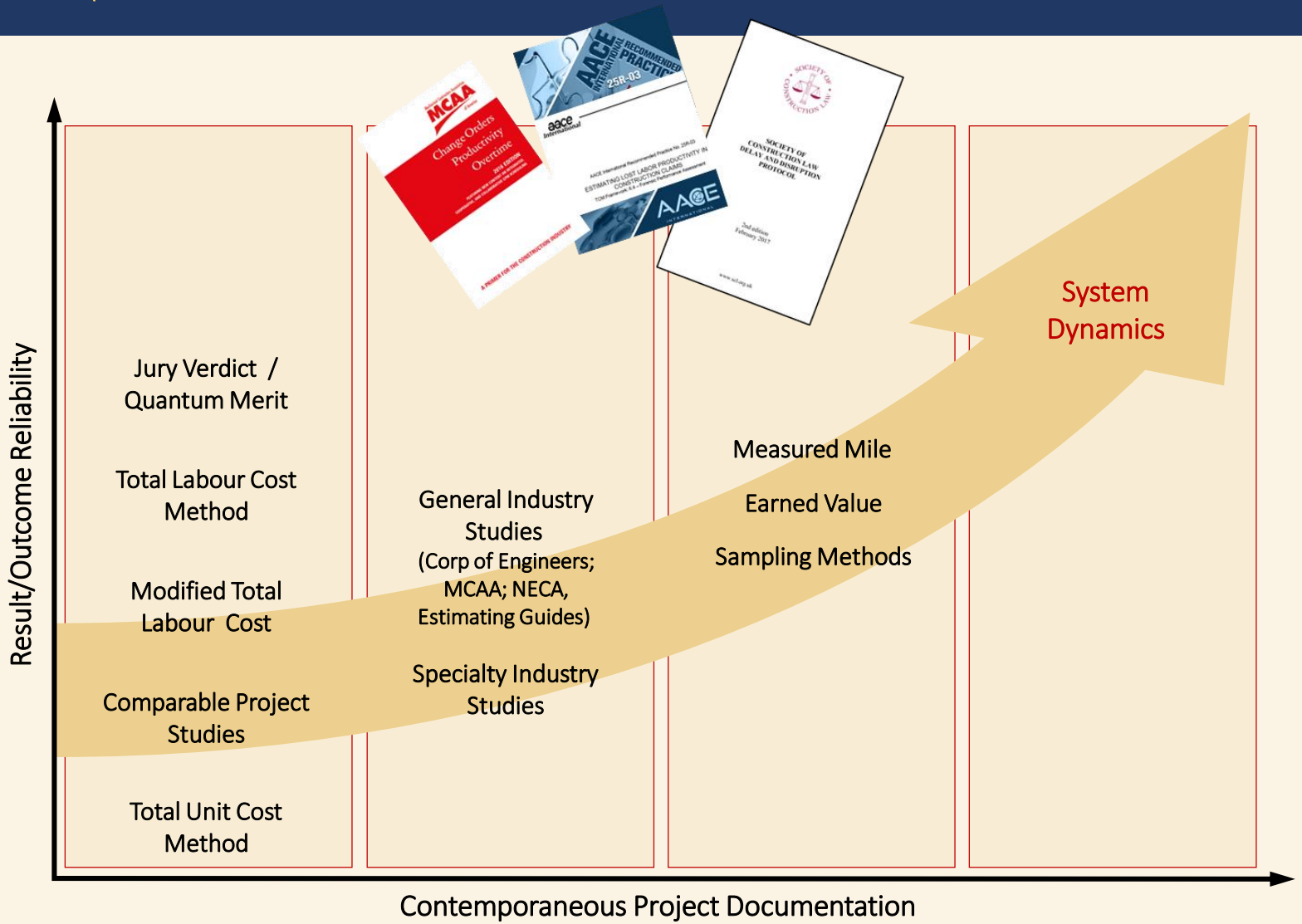
The method should be applicable to the whole project, and discount contractor-responsible events

The accuracy of the method needs to be testable, as well as its consistency with project data and information

Recovery rates are very low



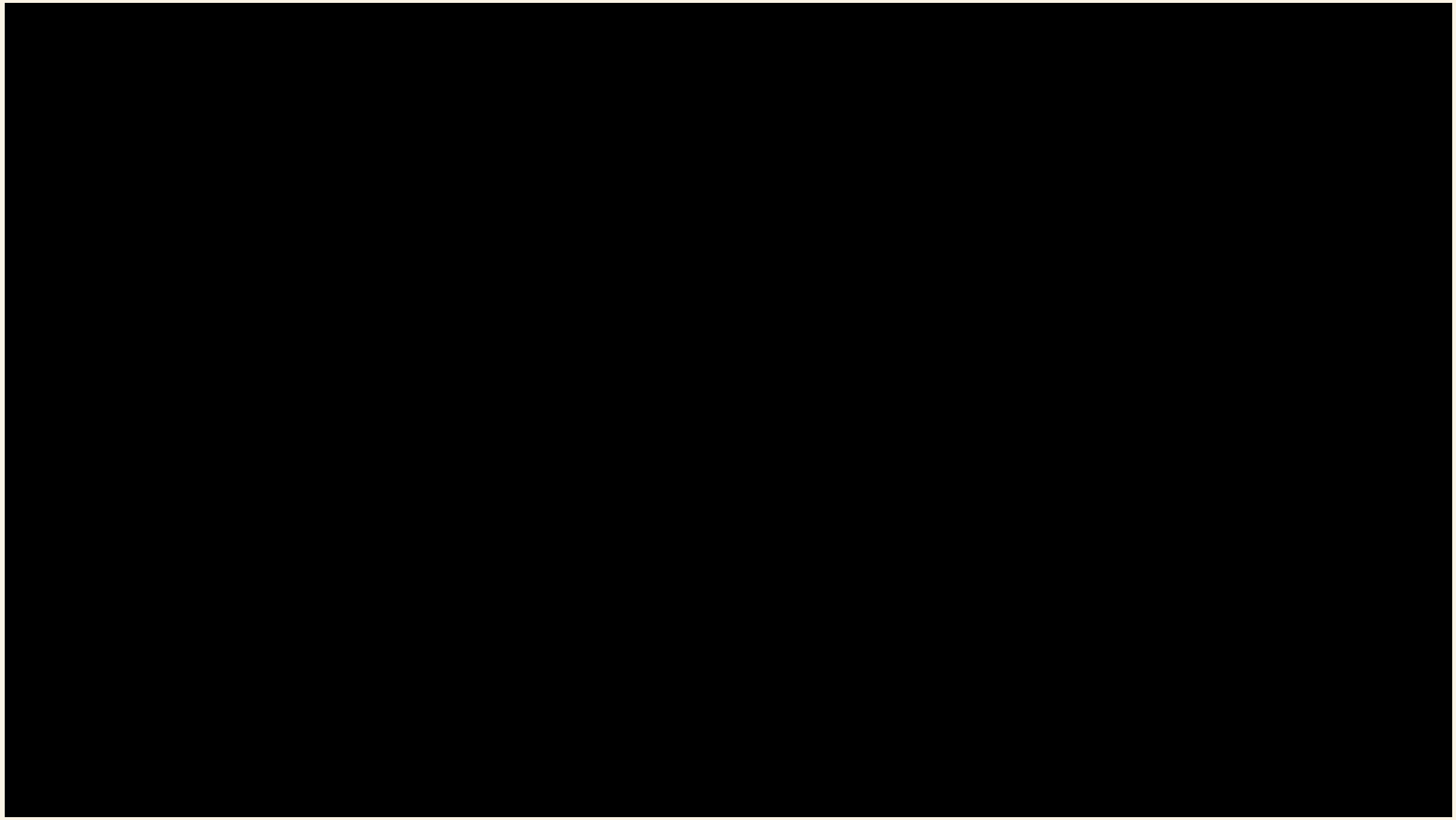
There is clearly room for innovation



An innovative simulation-based technology

- The **System Dynamics ("SD") computer simulation methodology** was invented at **M.I.T.** in the early 1960s.
- It was first applied to estimate project disruption and delay back in the late 1970s, helping to settle a $900 million claim between a US defence contractor and the US Navy.
- Since then, SD models have been used as proactive project management tools on hundreds of projects in many industries (oil & gas, aerospace, engineering, shipbuilding, software…)
- SD models have also been the basis for over forty major disruption claims worldwide, totalling over $20bn in claim amounts.

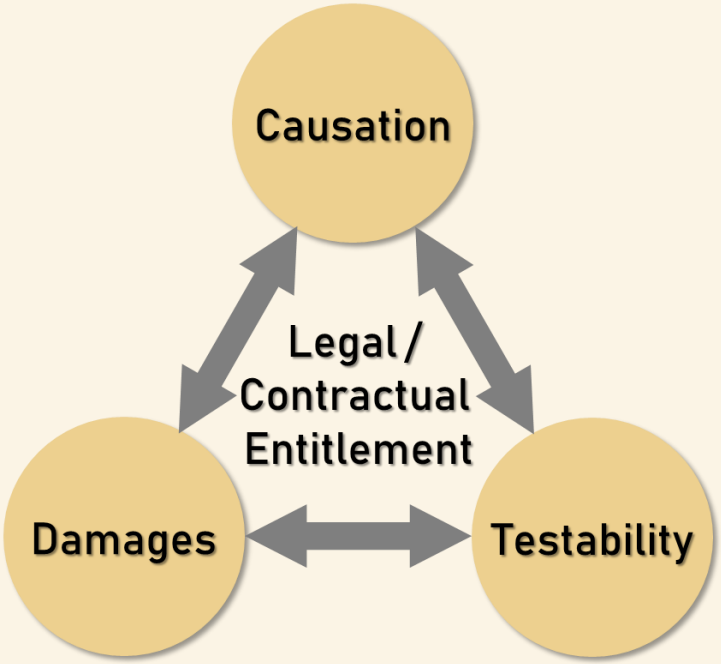
Introduction to System Dynamics



System Dynamics satisfies all the requirements for entitlement:

System Dynamics satisfies all three requirements for entitlement, making it the optimal tool to support negotiations, arbitration and/or litigation proceedings:

- **Causation**: Its simulation models transparently (and step-by-step) show the causal chain between disruptive events and their ultimate impact on the project.
- **Resultant Damages**: The models capture the full non-linearity of disruption. The analysis allocates to each event the disruption that it (and it alone) caused, and it also explicitly accounts for the role of mitigating "managerial" actions and/or adverse decisions.
- **Testability**: The simulation models are constantly verified against all information known about the project. Statistical confidence ranges can be established for model inputs and for claim results.



A real case: the 'Tuxedo Park' claim

'Tuxedo Park': 100% disruption recovery!

- Tuxedo Park was a design-bid-build development in the MENA region, budgeted at about $1bn, that:
  - Overran its budget by $500 million
  - Finished 2.5 years late
- The Contractor "knew" that the Employer had substantially impacted the project, but conventional analysis and the existing data trail did not (appear to) support this view.
- Yet, a forensic analysis using Dynamic Disruption Analysis proved that 60% of the overrun had been caused by the Employer.
- In **international arbitration**, the tribunal decided that the evidence produced by the analysis was credible and defensible, and awarded the Contractor **full recovery of the Employer-risk disruption**, as determined in the System Dynamics model (i.e., the entire 60% of the overrun.)

System Dynamics applied to Disruption

Any Questions?

We are here today!

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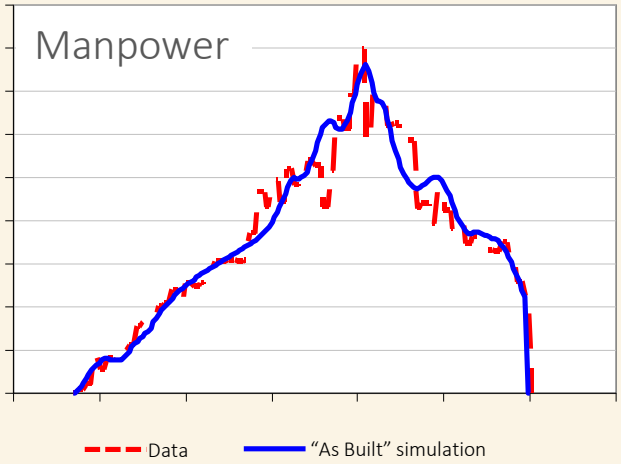
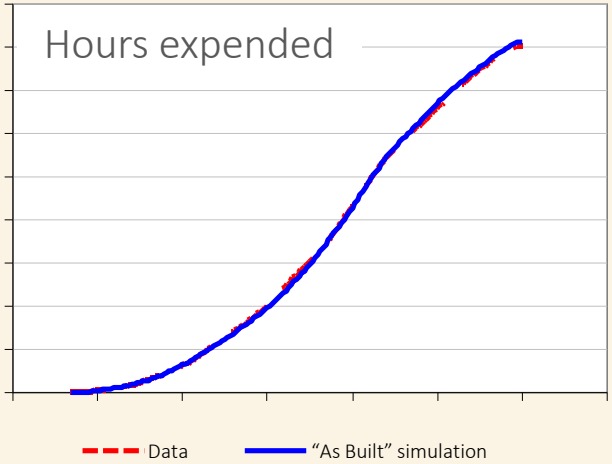
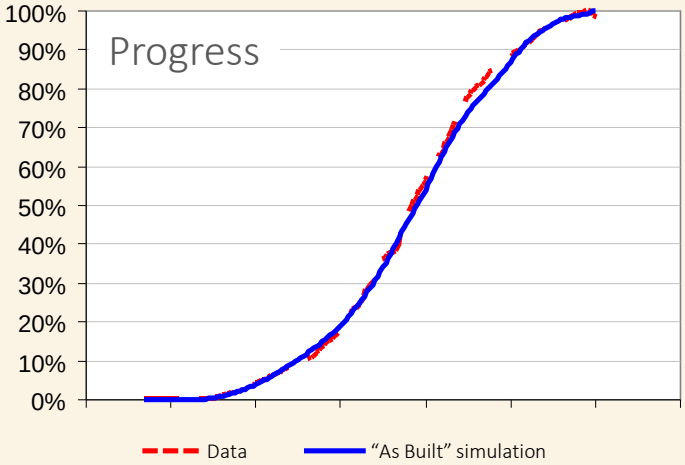
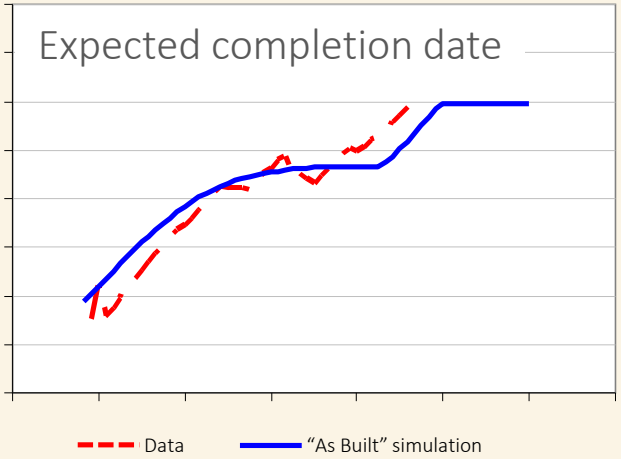
The simulation matches the data

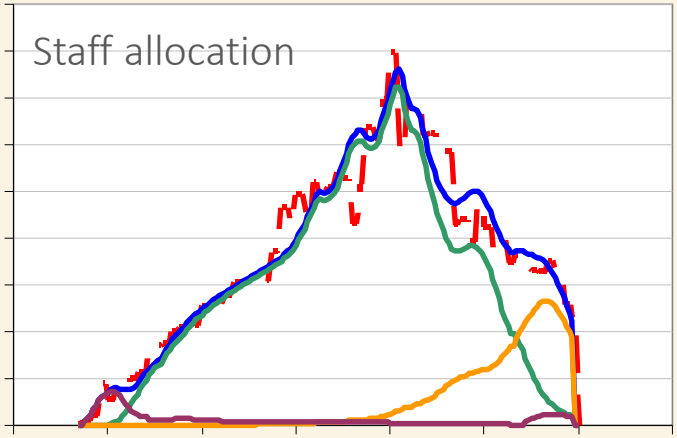




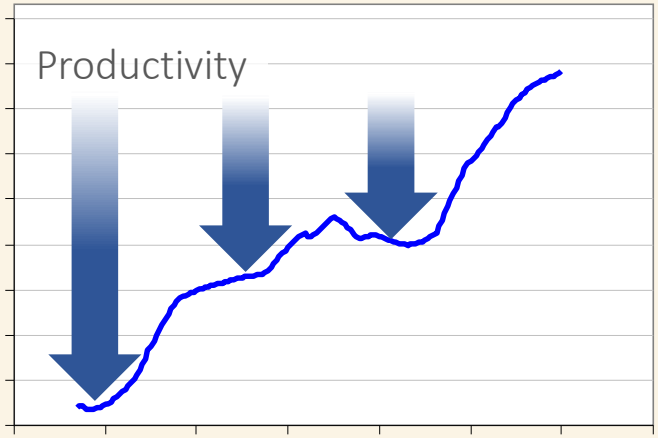




… and it tells a more complete story!

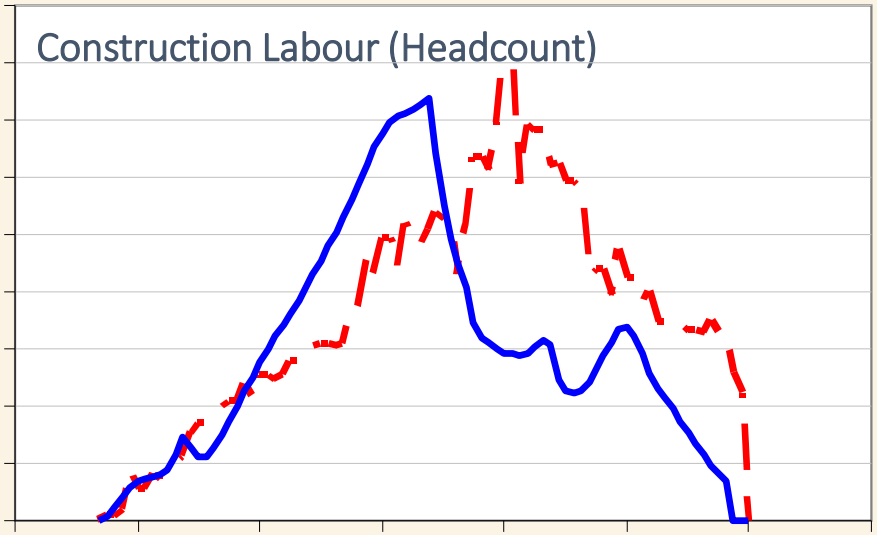


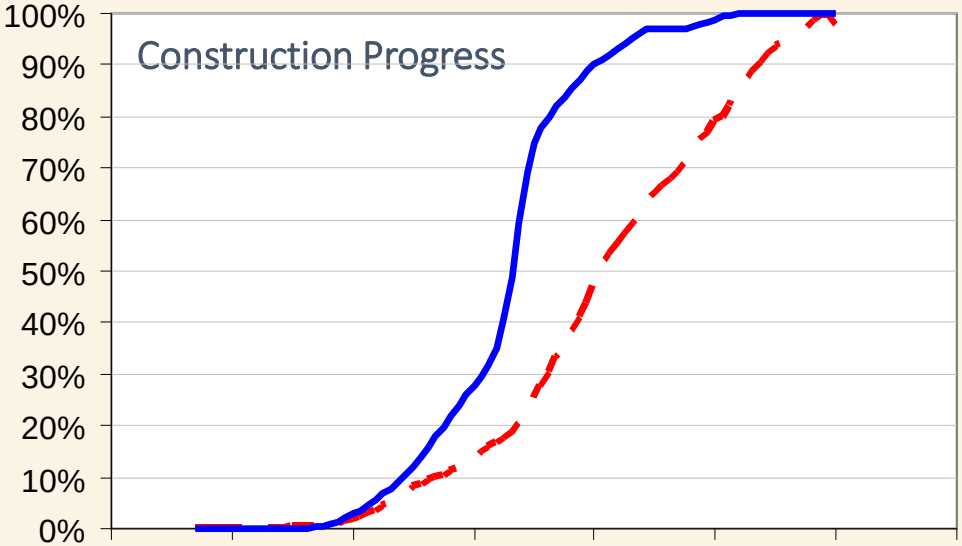
- Data
- Simulated
- First time
- Rework
- Other



- Learning curve
- Inadequate drawings
- Out of sequence (missing step drawings)
- Out of sequence (missing tools/equipment)
- Crowding

Early simulation results





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