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Using TOC to improve capital and construction projects:

Why CCPM by itself is not sufficient on projects involving significant outsourcing.

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UK

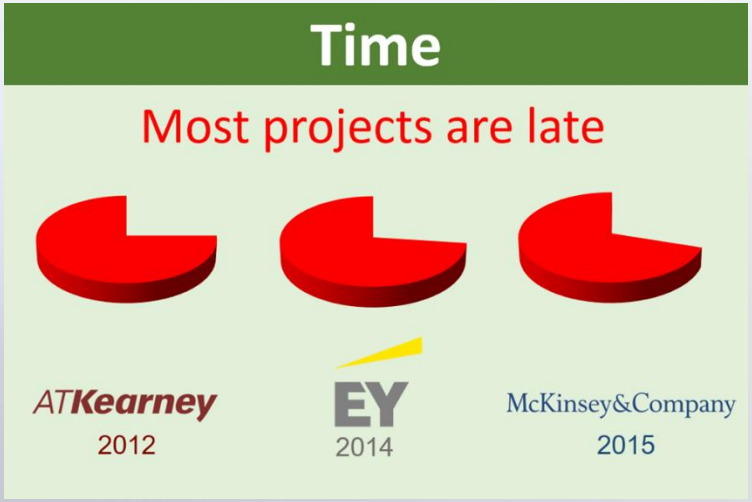
Capital & Construction Projects

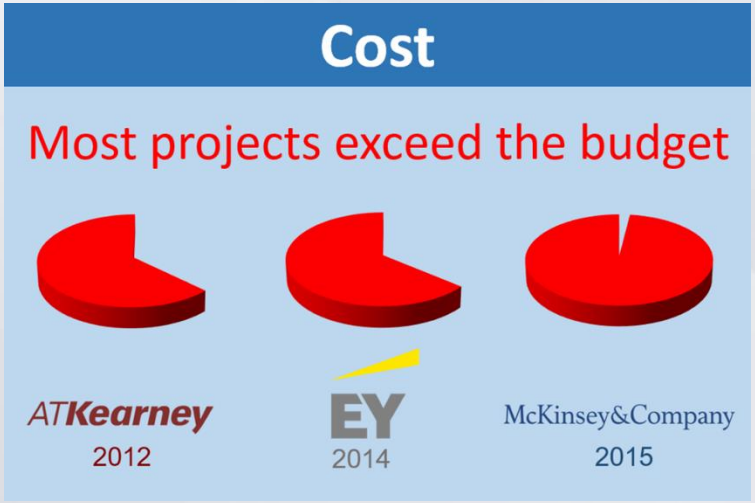
- Represents some 8-10% of global GDP
- Over $10 trillion spent each year
- Beset with issues & struggling to improve
- A fantastic opportunity for TOC in general and CCPM in particular to have a rapid and major impact

- ….if only it was that easy!

Construction & Capital Projects

- Have much in common with other kinds of projects
  - It seems to be hard to achieve on-time and on-cost results





- Performance seems to be going backwards

82 years worth of continuous improvement

Empire State Building

1931

102 floors

381m

209,000 m2

410 days to build

$350-600M to build

$2,000-3,000/m2

Values are in $ 2013

1 World Trade Centre

2013

104 floors

415m

270,000 m2

3112 days to build

$3900M to build

$14,000/m2

The Empire State Building, New York 1929-1931

Empire State Building

1931

102 floors

381m

209,000 m2

410 days to build

$350-600M to build

$2,000-3,000/m2

Values are in $ 2013

- Early, rapid, competence-based selection of the team
- "ECI" – Early Contractor Involvement
- Overarching team goal: Open 1 May 1931
- Off-site manufacture & modularisation
- Design for construction
- "Total Value Design"
- Focus on FLOW

How to make projects flow

- Use CCPM
  - It works, is proven, and can easily be applied
- BUT
  - CCPM assumes there is a collaborative project team
  - And that there are no substantial obstacles to collaboration
- This is NOT the case in capex projects
  - Fragmented team – hard to implement systemic improvements
  - Especially with the way the project is procured

The Main Barrier to collaboration

Procurement:
The Main Barrier to Collaboration

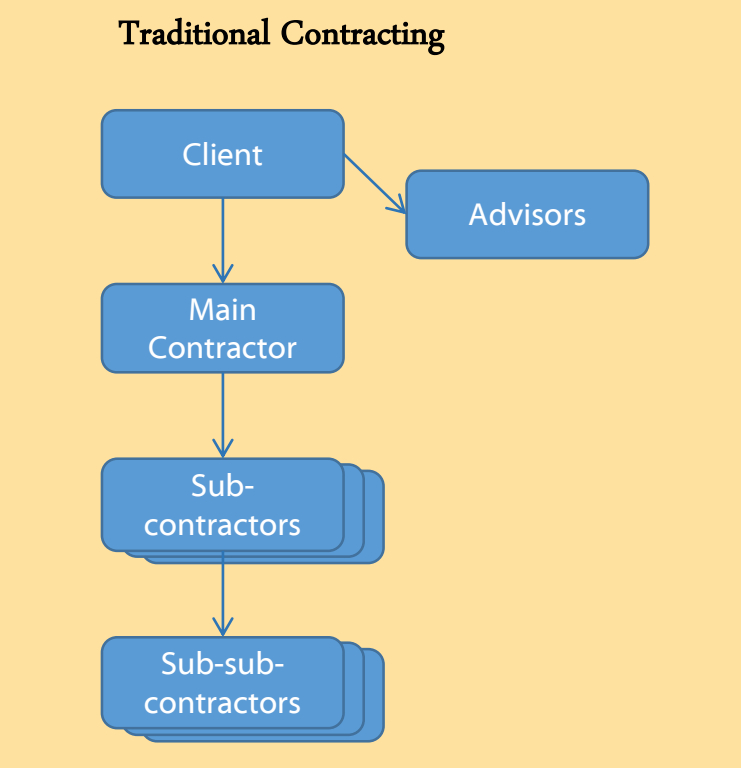
- The common forms of contract used on capital and construction projects are inherently un-collaborative in nature
- Fixed Prices, GMP, and associated penalties for breach
  - I can win, you can lose
  - Very high risk to suppliers
  - Add to the overall cost
  - Waste time because they take longer to agree, and for change to be managed
  - Incentivises conservatism and behind-the-scenes cost cutting
- Reimbursable or basic cost-plus
  - Incentivises suppliers to increase billings
  - Penalises suppliers who uncover savings and improvements
- Adding a “Partnership Charter” over the top of other contract terms adds a potential conflict
  - This can be made to work, with luck and senior-level support

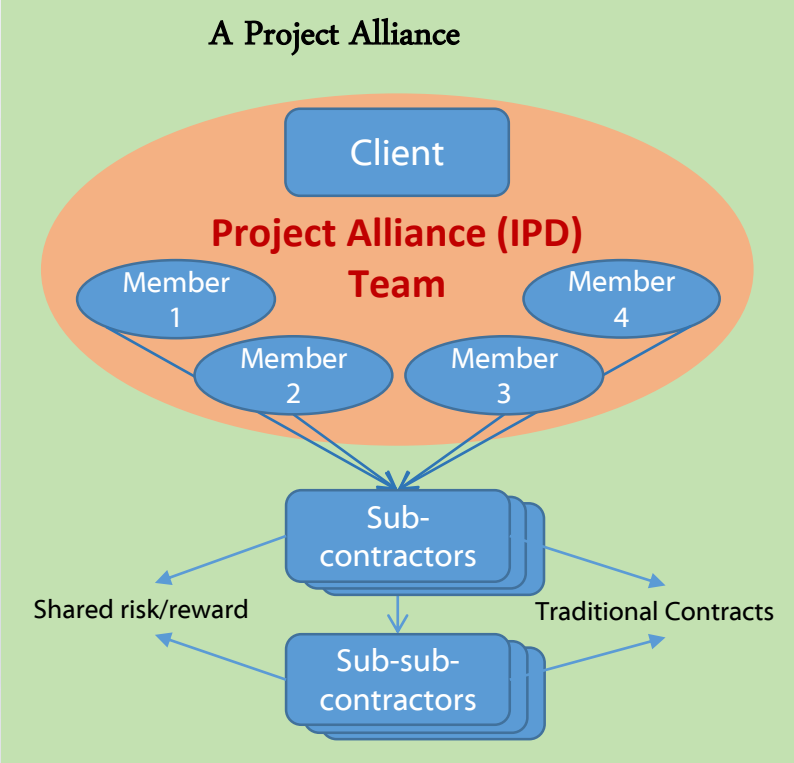
Overcoming the Procurement Barrier to Collaboration

- Use a Project Alliance contract
  - Also known as IPD – Integrated Project Delivery
- A project alliance involves…
  - A multi-party contract, that exists only for a single project
  - Early selection and involvement
  - An integrated team – “best for project” work allocation
  - Collective sharing of risks & opportunities
  - “Fault” and “Blame” are irrelevant
  - Unanimous decision making
  - Aligned commercial interests

The Project Alliance
(Integrated Project Delivery – IPD)

- Came to prominence in the 1990's – Oil & Gas Industry
- One team – One Contract

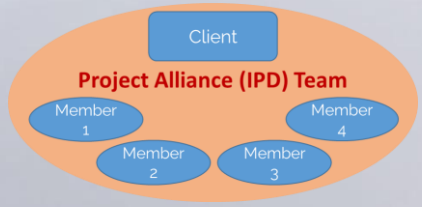




Payment under Project Alliance

CFV:

***C**ost + **F**ixed Fee + **V**ariable* Fee



Variable

- Linked to client project success
- Same % for all

Fixed

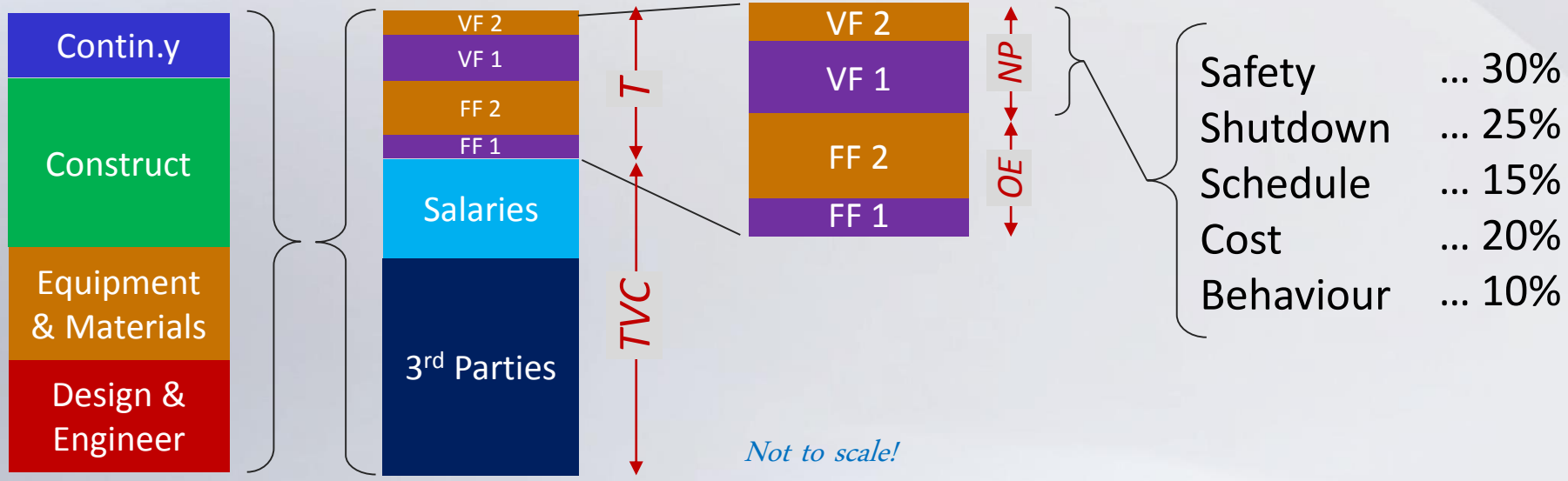
- Fixed in £/€/$
- Not a % age
- May be zero

Cost

- "Straight-through" cash.
- No mark-up

Using CFV Payments – The "Fix-7" Project

- A $30M project (2016 values). Modifying an existing chemical plant
- 3-party contract: Client | Engineer & Procure | Construct
- 4 week selection for $10M construction work
- RFP was 3 pages
- Payment using CFV method
  - Cost + Fixed Fee + Variable Fee

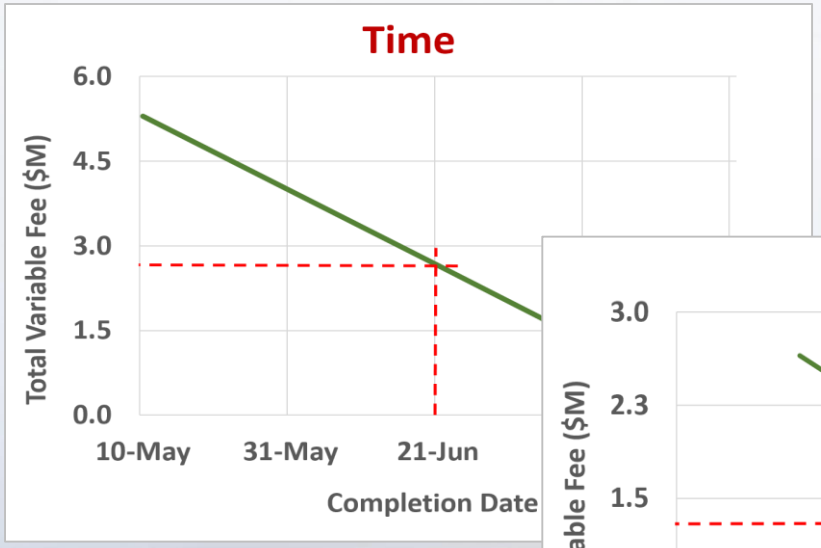


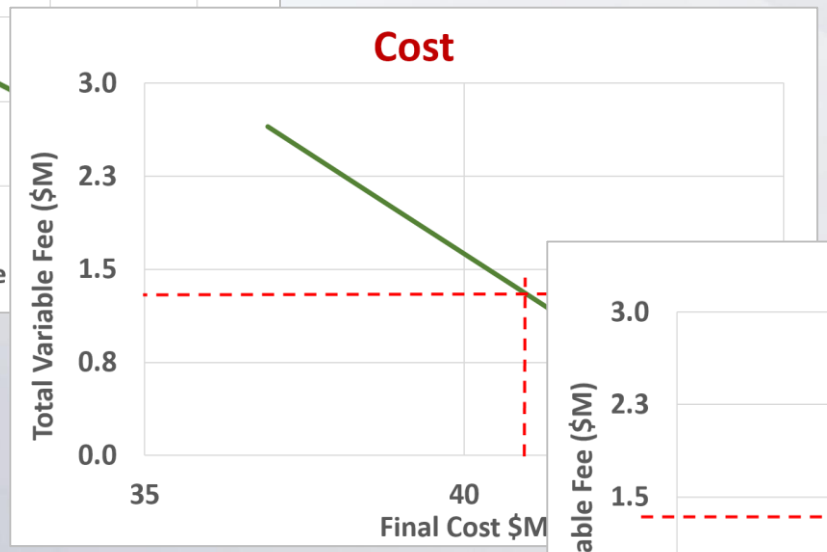
Performance Fee Breakdown

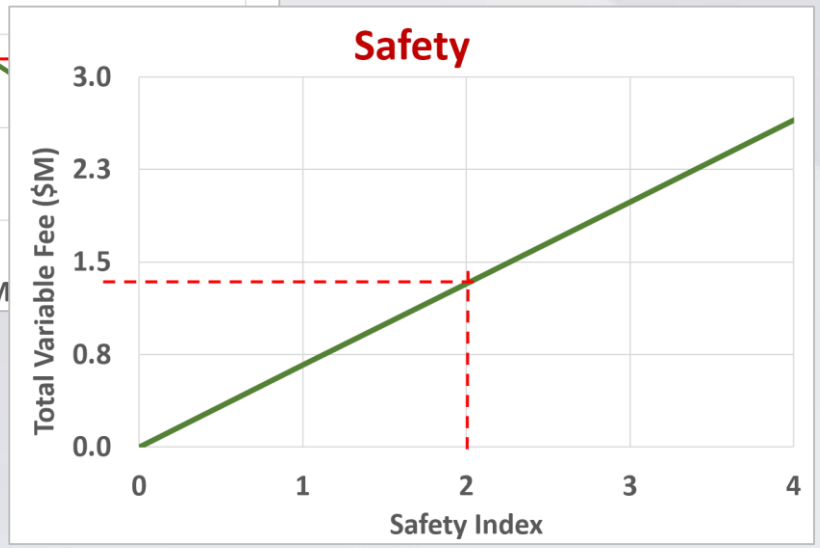
- Variable Fee – "Profit at Risk" = £300,000 total
  - Co.1: £200,000 67%
  - Co.2: £100,000 33%

		Nominal values	Actual Payments	
Safety	… 30%	£90,000	£180,000	
Shutdown	… 25%	£75,000	£22,850	
Schedule	… 15%	£45,000	£45,000	
Cost	… 20%	£60,000	£168,135	
Behaviour	… 10%	£30,000	£60,000	
		£300,000	£475,985	159%

Example Variable Fees







Customer Experience

Quality

Operating Cost

Behaviours

Aesthetics

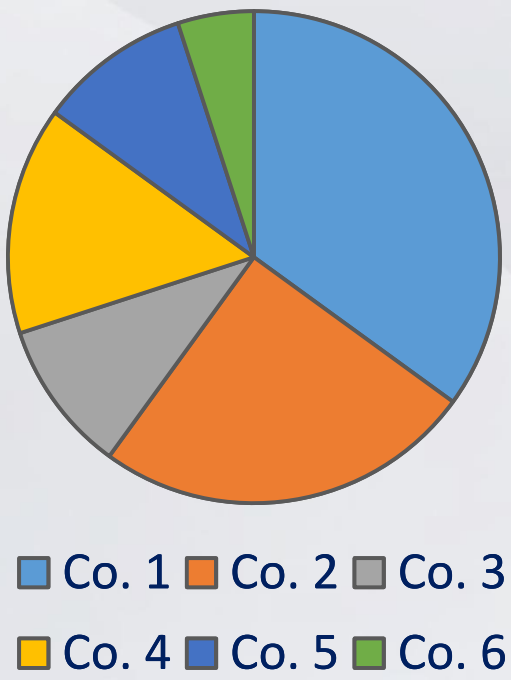
Life-cycle cost

Income/Profit/ROI

Efficiency

CFV Payment: Cost + Fixed + Variable

- Cost – fully reimbursed
  - Should be just that – no margin (TVC)
  - 100% money flowing through the supply partner
- Fixed Fee
  - Fixed in £/$/€, not a % of cost
  - A contribution to overheads
- Variable Fee
  - Each member gets a defined percentage of the performance fee pot
- Client Changes
  - Change the targets, F and V



A Project Alliance acts can still be competitively sourced

Even without fixed-prices

Traditional

- Late-as-possible selection
- Detailed bids based on scheme (Design-Bid-Build)
- Select lowest/fastest bid
- A chain selected one at a time
- Conflicting commercials

Alliance/IPD

- Early-as-possible selection
- Outline bids based on capability (Bid-Design-Build)
- Select best available team
- A team selected together
- Aligned commercials

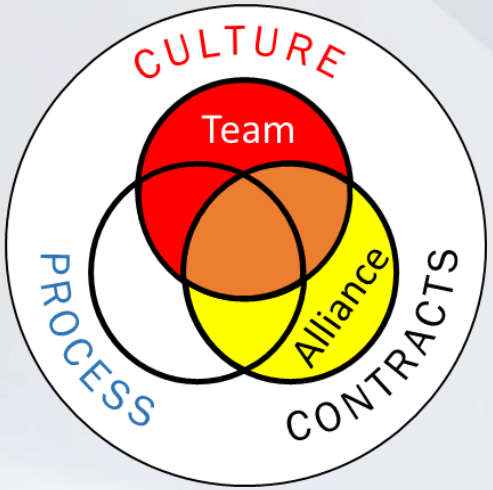
A Project Alliance (IPD) gives us

- A team where all the supply members' commercial interests are aligned with each other, and the project client
- Improved focus of management attention
  - On *making the project successful*
  - Compared to *ensure our contract is successful*
- Reduced waste
  - Contract administration
  - Synchronisation & control overhead
  - Time to select
- A great platform to build from

You get some benefit from the alliance itself

- Reduced ‘policing’ and ‘man-marking’ resources
- Reduces time-related costs from early selection
- Reduced waste in design time (design for selection)
- Improved client ROI from earlier completion
- Cost risk aggregation
- Facilitates creativity

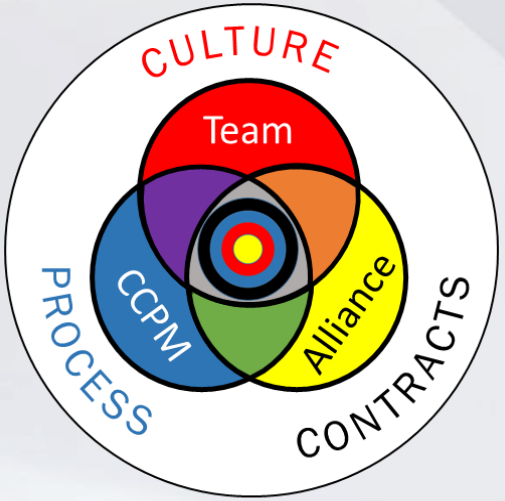
- Though none of this is “automatic”



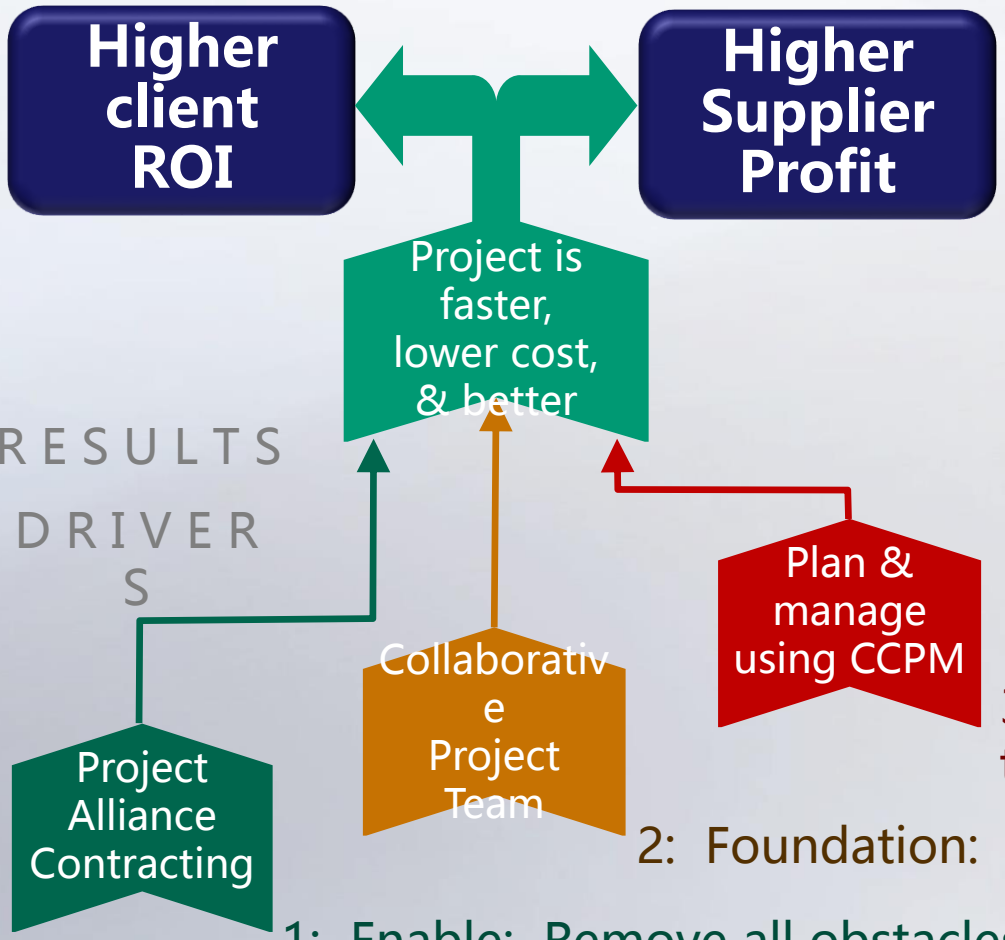
Critical Success Factors

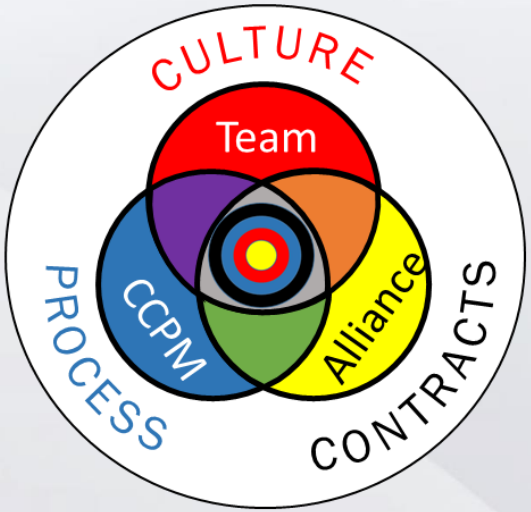
A Project Alliance/IPD is necessary…but not sufficient

- Exploit the collaborative team
  - CCPM
    - Same project in less time, at lower cost
  - and use value-enhancing methods & tools
    - BIM/PDMS & PIMS technologies
    - Standardisation & modularisation
    - Lean Construction tools
    - Value-analysis & engineering
    - PDRI - (Project Definition Rating Index)
    - ESI/ECI - (Early Supplier/Contractor Involvement)
- Lead the collaborative team
    - Manage the project & the project team
    - Not ‘your’ contract & your staff



Breakthrough Project Management





3: Exploit: Ensure the collaborative team delivers great results

2: Foundation: Teamwork built on common goals and

1: Enable: Remove all obstacles to project team collaboration

Ian Heptinstall

- Ian is a specialist in capital and construction projects. He helps project teams to deliver better, faster and lower-cost projects, using a methodology developed from systems thinking and collaborative procurement.
- This approach is described in his book "*The Executive Guide to Breakthrough Project Management*", co-written with Robert Bolton.
- Before moving into consultancy, he was Supply Chain Director for a leading construction company in the UK. Before that he spent the first 20 years of his career in a range of operations, project management and procurement roles in the chemicals and pharmaceuticals industries.
- Ian is a mechanical engineer by qualification, he is Fellow of the Chartered Institute of Procurement & Supply, and an active student of TOC.

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