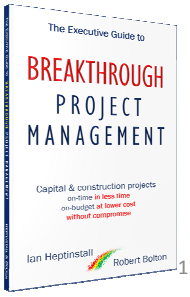
PGCS PROJECT AND PROGRAM MANAGEMENT SYMPOSIUM
Better Management Better Projects

Breakthrough Project Management
Combining Project Alliancing (PA) and Critical Chain Project Management (CCPM)

Methods that INCREASE and ENSURE project collaboration and EXECCUTION

Robert Bolton

Wednesday 15th August 2018



Real Capacity

On-time or less time
On-budget at lower cost
Without compromise

1

Quiz

- Aware of Project Alliancing?
- Aware of Critical Chain Project Management (CCPM)?
- Aware of probabilistic scheduling?
- How would you describe this?
- Use of simulation software? MCS, iThink, Prism.

Real Capacity

2

The "Black Swan" approach to projects

Can a project be on time, in full, and on budget?

3

Agenda

- Challenge in projects
- Critical Chain concept
- Where infrastructure / construction / defence is different
- Defence / construction – "a vicious cycle
- Breakthrough Project Management (BPM)
  - Combining Project Alliance (PA) and
  - Critical Chain Project Management (CCPM)

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Robert Bolton

Civil Engineer (Sydney)
MBA (Ashridge UK)
Company Director (AICD)
Demand Driven Planner (CDDP)

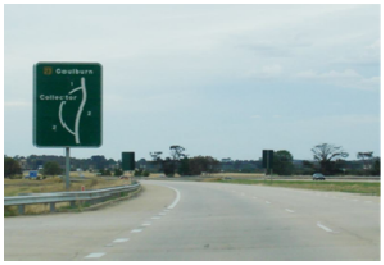
Infrastructure, mining, oil & gas, IT, Funds Management.

All aspects of Project Management

Expert in Theory of Constraints (ToC),
Developed Critical Chain & ToC Mining
Throughput Focused Mining (TFM)
Fast track construction
Activity Based Costing (ABC)

Sydney Convention Centre

Collector Bypass



Sydney Harbour Tunnel (SHT), Cut & Cover

London Victoria Goldmine

Robert Bolton

Land Rover, Birmingham UK

Argyle Diamonds, WA

Worsley Alumina, WA

JNA Lucent, NSW

Iuka Resources, WA

Chevron FMC, Subsea, China

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Financial and IT

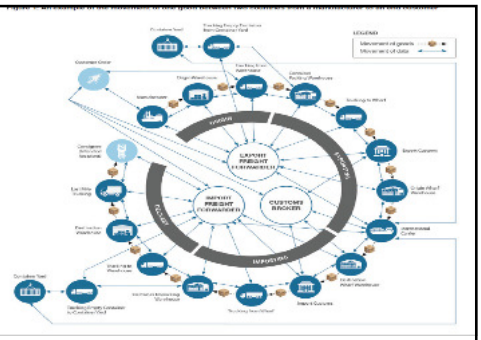
Common theme: Smart people dealing with lots of data trying to make the right decisions at the right time.

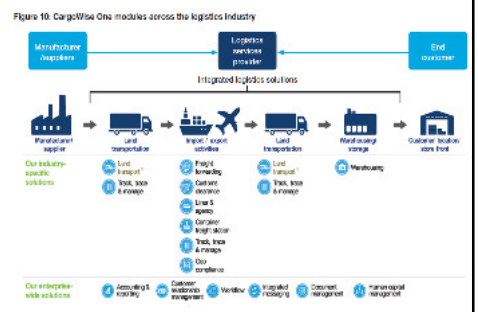
Direction: Building the management systems that help these successful companies make better decisions.

7

WiseTech GLOBAL (ASX: WTC)

- Software (Saas) for freight forwarding, supply chain and logistics Industry.
- Simplifies industry information flows
- Strategic Growth Projects
- Listed ASX Apr 2016 – Share Up





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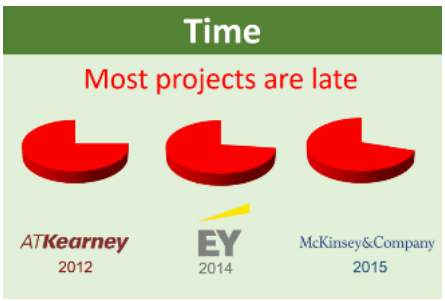
Capital & Construction Projects

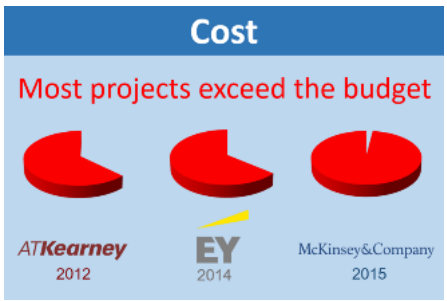
- Represents some 8-10% of global GDP
- Over $10 trillion spent each year
- Beset with issues & struggling to improve
- Direction of most solution, deterministic and requiring more data

- ….very few systemic approaches being proposed…

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

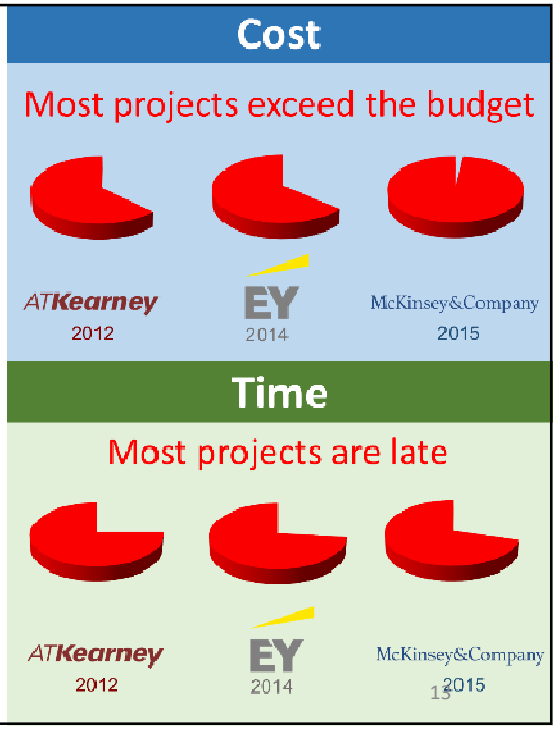
102 floors
381m
209,000 m2

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

What is wrong with capex and complex projects today?



Real Capacity

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Multiple Entities and Stakeholders

Customer
- Projects are late
- Projects are over budget
- Projects don't deliver what was expected

Project Manager
- Don't get required skills
- Don't get required number of people
- Don't get access to expertise
- Not enough time or money
- Scope changes but timelines and budget remain

Resource
- Yanked from one project to another
- Others don't seem to care about quality work
- No time for training or personal growth

Shared Resources
- Can't plan schedule
- Multiple requests to help
- Everyone asks for same resource by name
- No budget for extra resources or training

Suppliers / Subcontractors
- Specs keep changing
- Frequent start and stops
- Approval takes time

Portfolio/Program Mgr./ Financier's
- Loss on project
- Customers not happy

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What is wrong with capex / complex projects today?

Commercials take so much time

Disputes and claims

Fixed prices for uncertain scopes

Tension between supply members

Poor plans & no-one follows the plans

Murphy

No, or little, team spirit

Everyone for themselves

Issues become BIG before they are noticed

Shortage of skilled resources

Are the Challenges any different?

Challenge	Engineering / Design	IT	Construction	Defence
Schedules are tight	✓	✓	✓	✓
Scope changes	✓	✓	✓	✓
Do not get the required skills	✓	✓	✓	✓
Budget cuts	✓	✓	✓	✓
Changes with no additional $ or budget	✓	✓	✓	✓
People come to project too late. Or are exited too early.	✓	✓	✓	✓

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Do we have multi-tasking in project's today ?

Planning

to …

Execution …

The effects of conflicting resource priorities between projects

Task A
Project 1
One Week

Task B
Project 2
One Week

Task C
Project 3
One Week

Three Tasks arrive at the same time for the same resource. All Projects are essential for the success of the program – what can the resource do?

The multiplying effect of multi-tasking

Task A
Project 1
One Week

Task B
Project 2
One Week

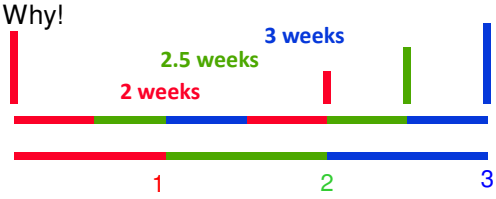
Task C
Project 3
One Week

In order to keep each project on track, a resource does half of task A, then half of task B, then half of task C, then finishes task A, then B, then C.

How long does each task take to complete?

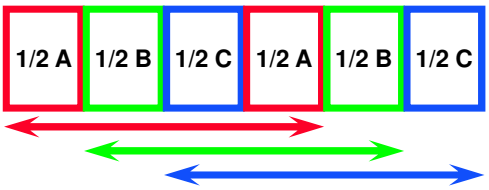
What happened to the safety time?

Why!



How long could each task take to complete?

Juggling project priorities - bad multi-tasking



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How long does each task take to complete?

Task A
Project 1
One Week

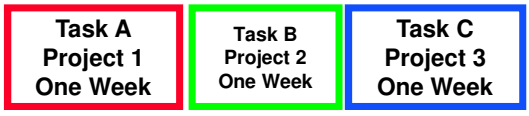
Task B
Project 2
One Week

Task C
Project 3
One Week

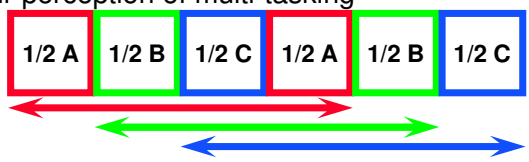
Vs. Focused Effort

Reducing Bad Multi Tasking

Estimated duration time the tasks could take



Our perception of multi-tasking



What is the effect when you are dependent on A, B or C?

The *REALITY* of multitasking

Time

Real Capacity

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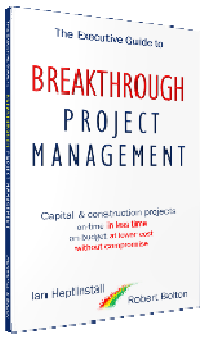
How we plan?
How we manage execution?



- Fixed prices & deadlines
- The Plan
- Monthly
- Cost
- Start ASAP

- Ranges & best efforts
- Execution & Control
- Daily / Weekly
- Focus & Flow
- Start ALAP

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Does this work?

Surely things will spiral out of control?...

Real Capacity

35% faster than before

25% increase in project throughput

90%+ due date performance

Reduced project team burn out.

Real Capacity

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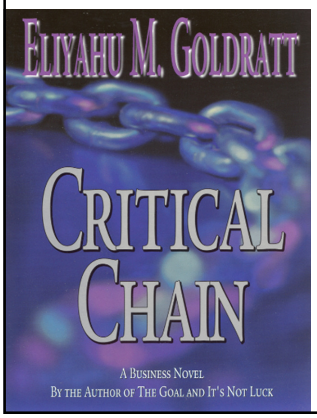
Critical Chain Project Management = CCPM



Released in 1996

Pioneered and Developed in USAF, US Navy, Boeing, Israeli Aircraft Industries (IAI)

- Codifies much of what the best PM's do 'intuitively'
- Systemic
- Many differences in focus from Critical Path
- BUFFERS

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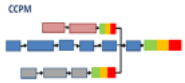
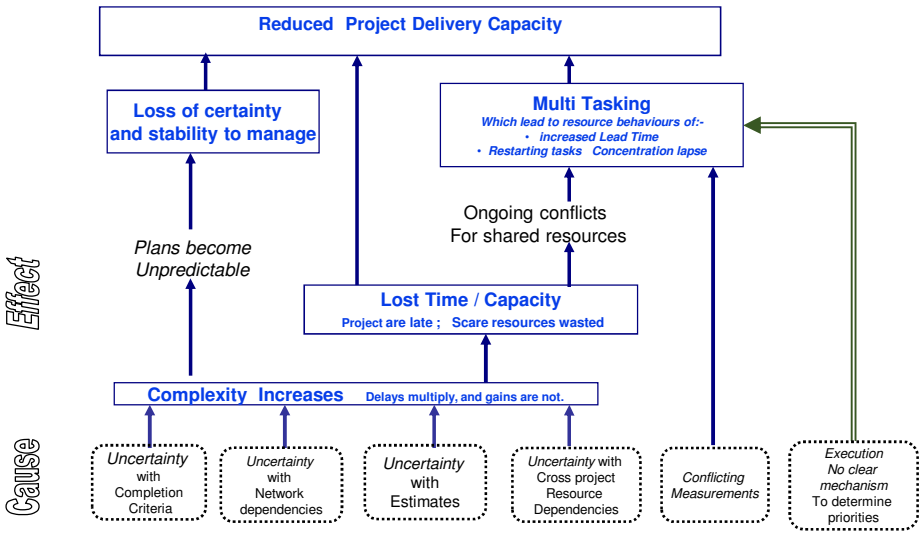
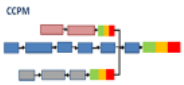
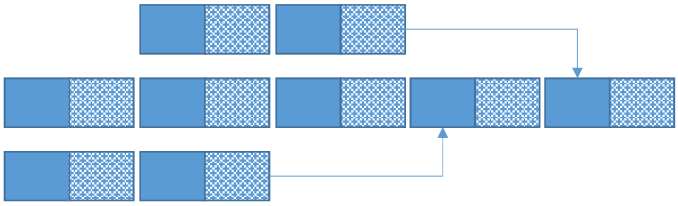
Problem Summary

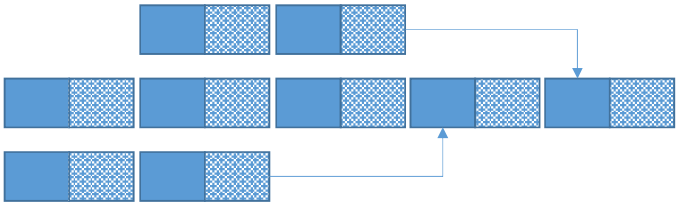




BUFFERS: Shared Safety







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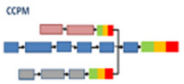
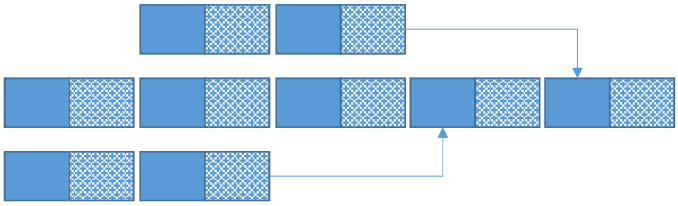
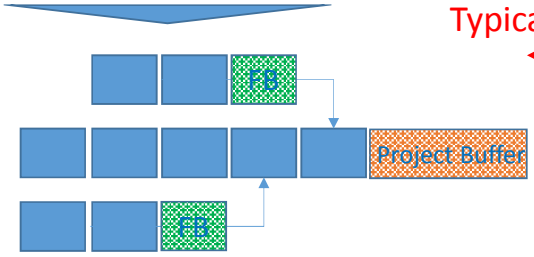
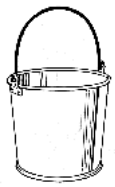
BUFFERS: Shared Safety





Typically 25% shorter





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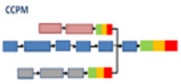
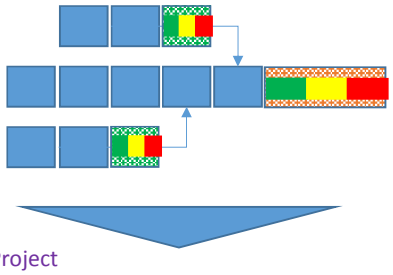
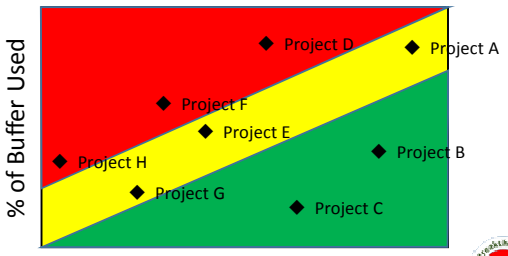
BUFFERS: Management Focus





Single Project

Portfolio



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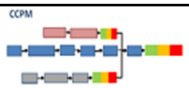
CCPM works



Delivers projects in significantly less time that they would otherwise take

Highly reliable end dates

Demonstrated time and time again.

So why is it hardly in one of the largest parts of the global economy,

capital & construction projects?

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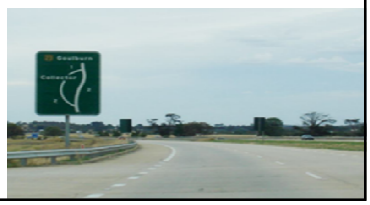
View on capex / infrastructure projects

- Significant Inertia:
  - Well established methodologies
    - Drowning in jargon and its own language
  - Pockets of good performance
  - Significant vested interest in the status quo
    - Entrepreneurial Project & Contract Managers
    - Professional Advisers
  - Significant public sector market (typically 30-50%)
- Cost needs managing as well as time
- Most of the work is outsourced
- Many commercial entities involved
- Assembly points (contractors) perceived as unprofitable
- Low investment in innovation



The Main Barrier to collaboration

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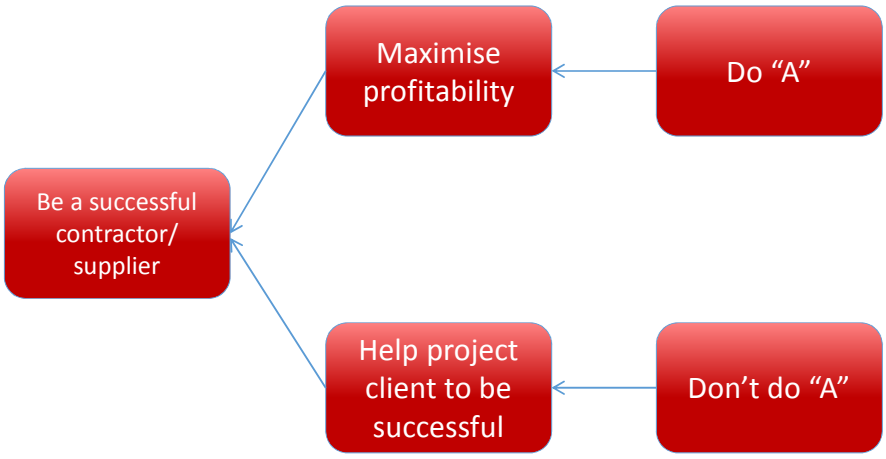
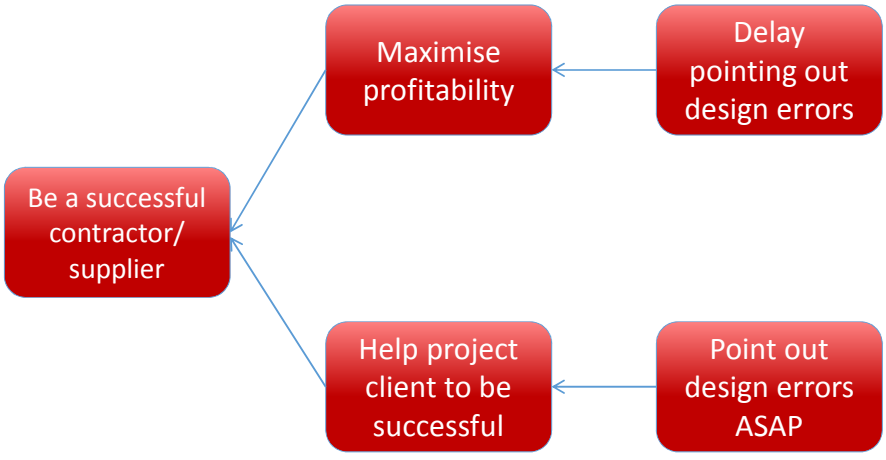
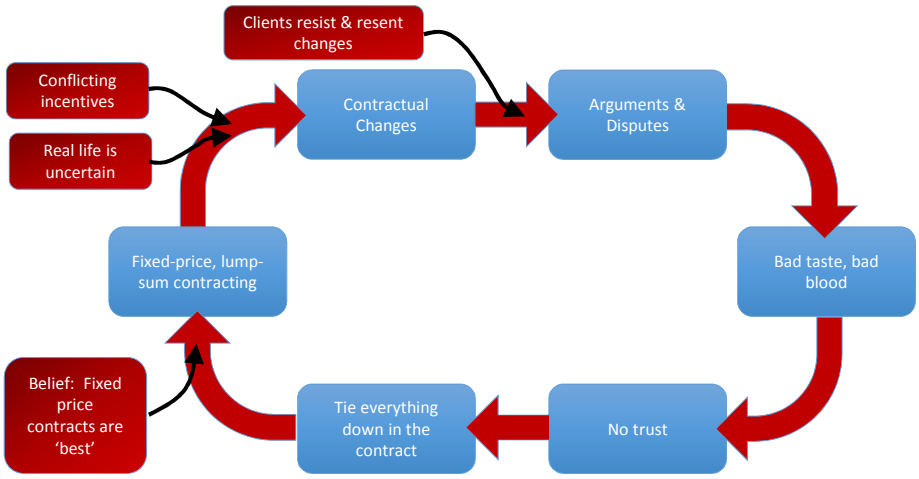
The contractors /supplier's dilemma



The contractors / supply chain dilemma i.e.....



The industry Vicious Cycle



An industry truism

Thanks to John Thompson of Exepron for the photo

An industry truism

Thanks to John Thompson of Exepron for the photo

Fixed Price Bidding - *unintended consequences?*

- It adds to the project duration
- It adds to the project cost
- It reduces quality
- It inhibits collaboration

- *And how often is the final price the same as the bid price anyway?...*

Direction of a solution
From competition to collaboration

- Fixed prices
- Independent Suppliers
- Push risk down WBS
- Every one for themselves, separate measures

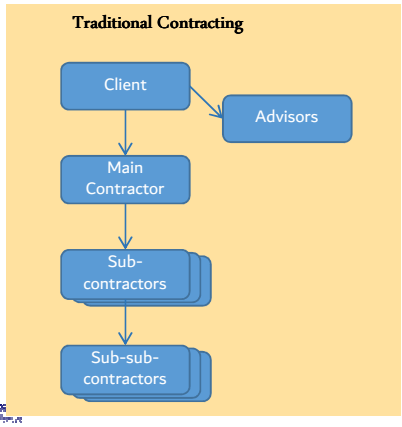
WBS = Work Breakdown Structure

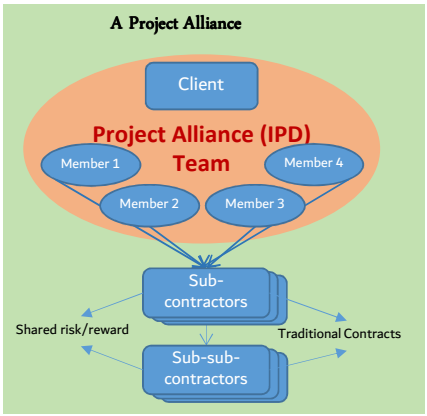
- Performance-related fee
- Aligned suppliers
- Manage risk across project
- Single team, same measures

The Project Alliance (PA)

(Integrated Project Delivery – IPD)

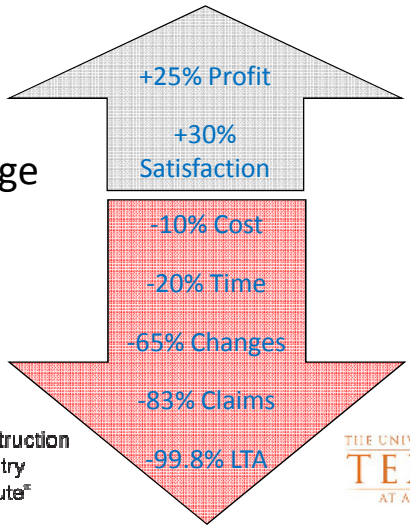
- Came to prominence in the 1990's – Oil & Gas Industry
- One team – One Contract
- Rapid problem solving





Collaborative project teams deliver better results

This is not a new message for the capex project sector

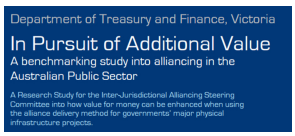


Construction Industry Institute

THE UNIVERSITY OF TEXAS AT AUSTIN

Project Alliance Contracting

- *Or Integrated Project Delivery (IPD).*
- First significant use in UK North Sea oil & gas, late 1980's at the time of the previous oil price crash
- BP started to use in Australia in 1990's
- Use mushroomed in Australia since 90's
  - Government report 2009 - $25B projects in 4 years – zero legal disputes
- Public sector use in UK ($40B project in 15 years with only 2 legal disputes)
- Growing public sector use in Finland



Characteristics of Project Alliances

- Victoria Treasury guidelines considered worlds best practice.

An integrated team, competence-based selection

Collective sharing of risks and opportunities

"Fault" and "blame" irrelevant in the contract

Fully reimbursed variable costs, and margin aligned to the overall project success

Unanimous, principle-based, decision making

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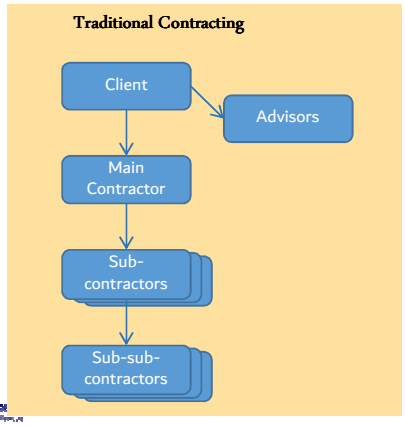
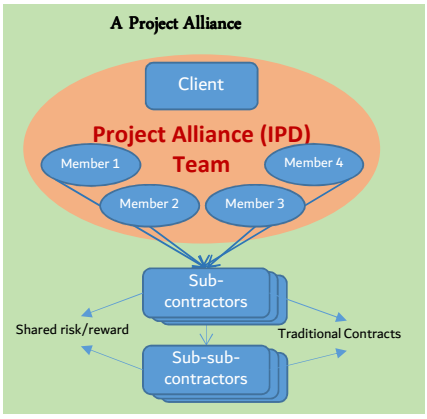
The Project Alliance

(Integrated Project Delivery – IPD)

- One team – One Contract
- Rapid Problem solving

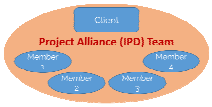




Payment under Project Alliance (PA)

CFV: (Method)

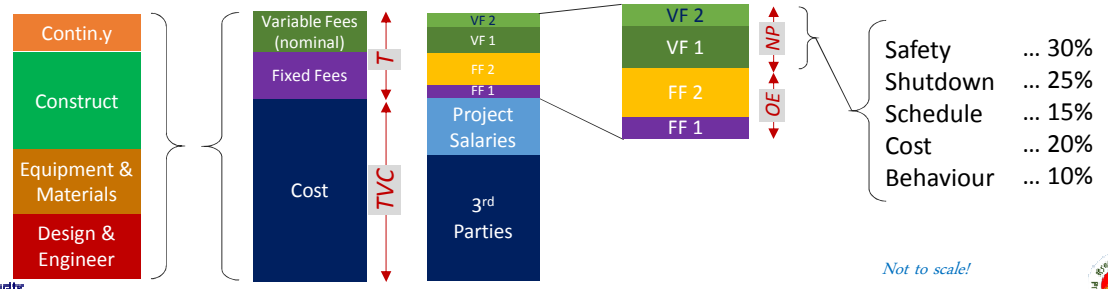
***C**ost + **F**ixed Fee + **V**ariable* Fee



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

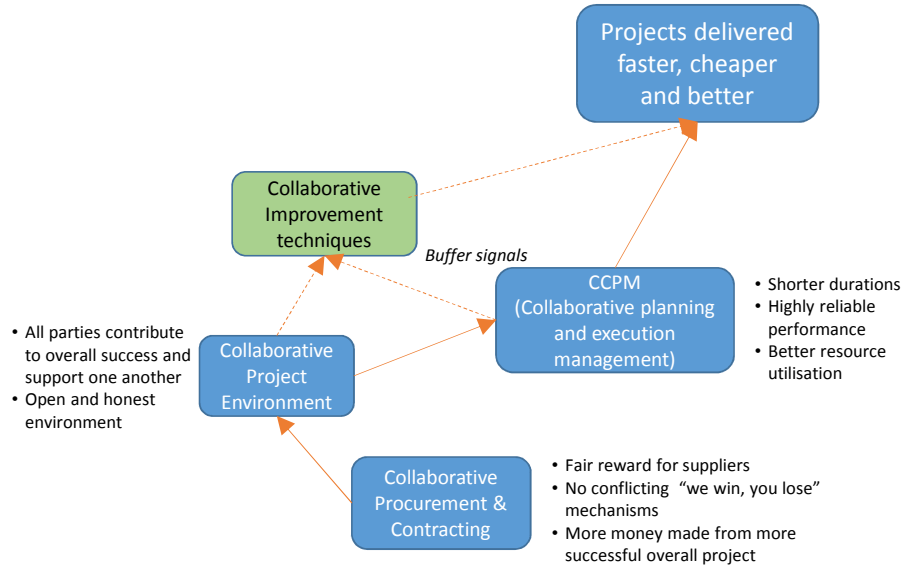


Performance Fee Breakdown

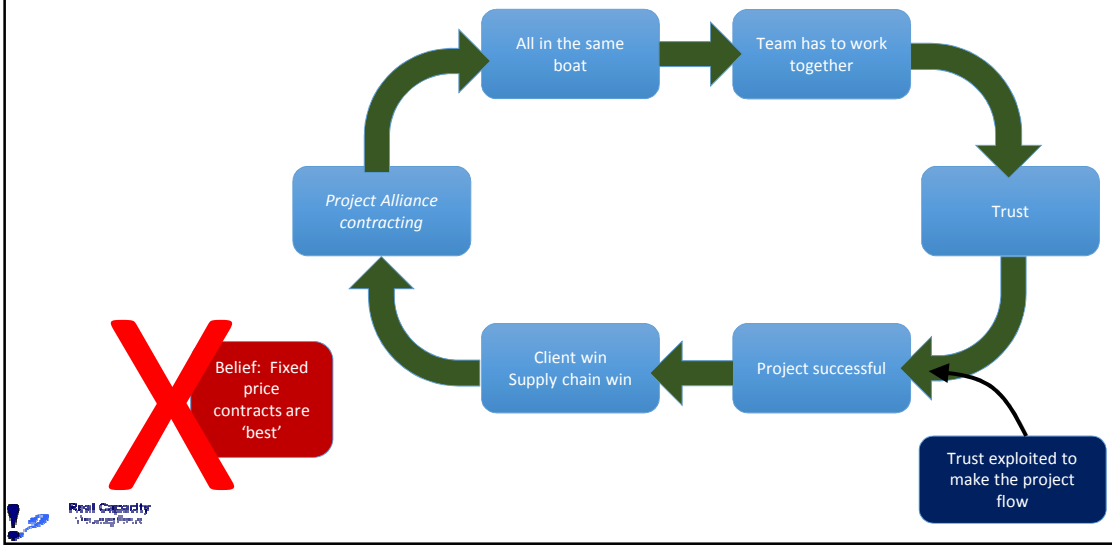
- Variable Fee – "Profit at Risk" = £300,000 total
  - Co.1: £200,000 67%
  - Co.2: £100,000 33%

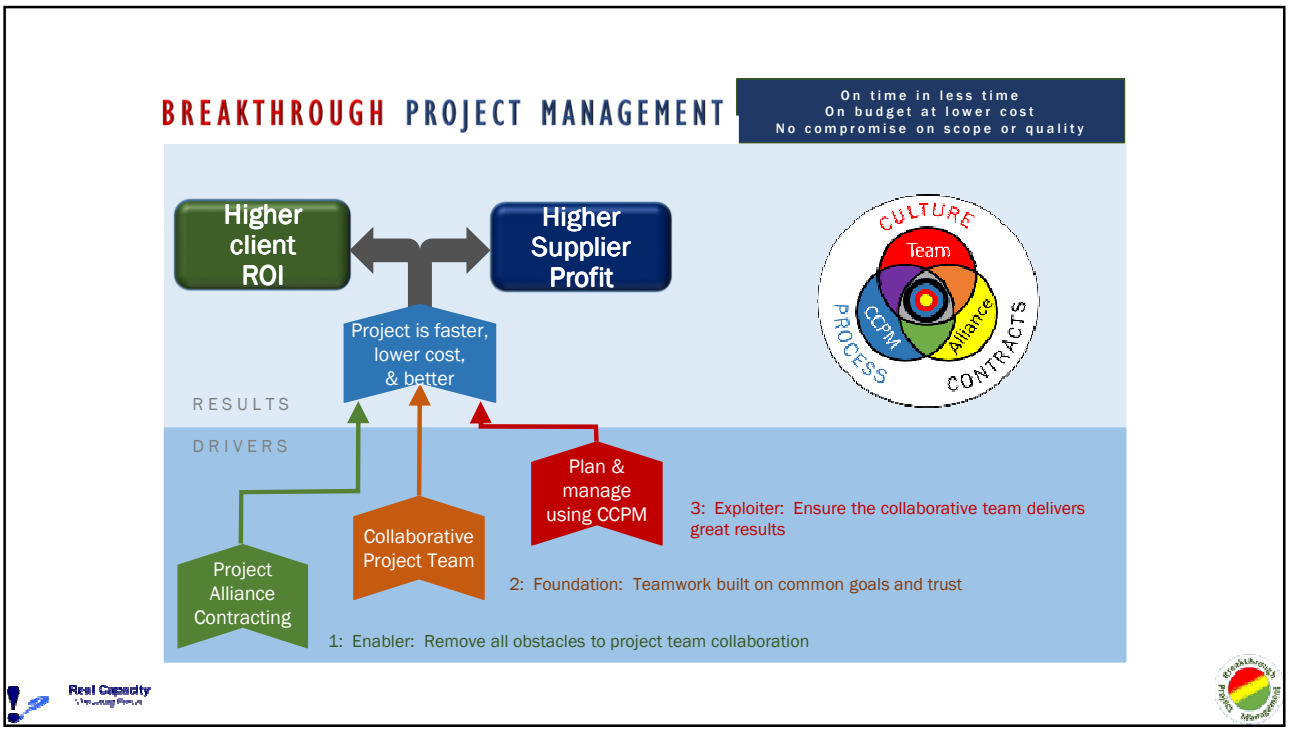
		Nominal values	Actual Payments	
Safety	… 30%	£90,000	£180,000	
Shutdown	… 25%	£75,000	£22,850	
Schedule	… 15%	£45,000	£45,000	
Cost	… 20%	£60,000	£168,135	
Behaviour	… 10%	£30,000	£60,000	
		£300,000	£475,985	159%

Breakthrough Project Management



The Industry Virtuous Cycle – future ?





Summary

- Project Alliancing (PA) better manages the project cash flow risk by cost aggregation up front (planning), and appropriate allocation during the execution phase.
- Critical Chain Project Management (CCPM) better manages the schedule risk by task uncertainty and project wide priority setting (Buffer Management) during the execution phase.
- Both these method increase the rate and efficacy of project problem identification and resolution.
- Both these methods have been successfully used in infrastructure project environments.
- Combining Project Alliancing (PA) and Critical Chain Project Management (CCPM) results in increased project reliability for both the client (asset owner) and the project delivery team.

Real Capacity

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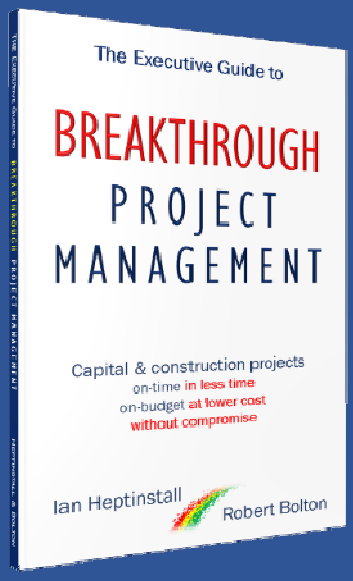
Questions ?



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Contact

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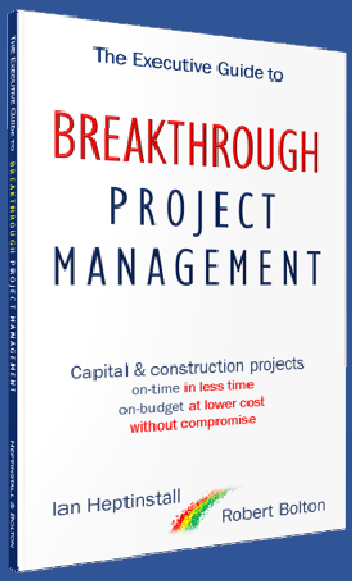
Details on how to apply these ideas to your projects can be obtained at:

https://www.breakthroughprojectmanagement.com/bpm_manifesto_for_change/

Or https://goo.gl/IY9t2k



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Back up's and Case Studies