



REGIONAL ROUNDTABLE of BUILDING CONSTRUCTION CLIENTS
IIT Madras, 14 October 2015

**Industry Improvement Initiatives overseas -
*What can we learn and how can we do better?***

Mohan Kumaraswamy

T.N. SUBA RAO BRIGADE GROUP *Adjunct Chair Professor, IIT Madras*

Honorary Professor, The University of Hong Kong

from GAME PLAN for 20 minutes to GAME PLAN for 10 years

Overall Objectives of Ci3 INDIA -

So why Kick-off with Building Construction Clients?

Overview of Overseas Initiatives -

Industry Reform Initiatives and Change Agendas

Industry Development Bodies and Reforms Implementation

Specifics from UK and Hong Kong

Key Performance Indicators (KPIs), Residual issues

Residual & Emerging Issues & potential Game-Changers -

Over-runs, Client Disappointments, Disputes & Remedial strategies

Delayed Payments, Non-Payments (inclgd. in supply chain) & Remedies

Linking Planning, Designs & Construction **to** Operations & Maintenance –
i.e. **to** better Built Asset Management

GAME PLAN for 10 years – How best can INDIA do better?

... from Regional Roundtable **to** National Roundtables **to through to**
a viable and valuable Ci3 INDIA

Overall Objectives of Ci3

- (1) To identify current and imminent critical issues in the Construction Industry in India ...
- (2) To compile a Roadmap with Milestones for industry improvements in strategic, high impact and far-reaching domains
- (3) To launch (a) system improvement initiatives and (b) demonstration projects, in prioritized focus areas.

Why kick-off with progressive Building Construction Clients?

Breakthroughs must be championed by a **united front** of **leading-edge clients** with long-term vision for boosting productivity, quality and sustainability, and value-driven project delivery. Must also drive industry culture change.

Supply chains only **respond** to paymasters' **selection and performance criteria**. Must incentivise and accelerate best practices & change mind-sets

What's in it for Clients, their Supply Chains and Society?

All **stakeholders** benefit from significantly higher overall value, financial and reputational returns. **Society** benefits from an efficient & effective industry – **too altruistic?**

Also, **cutting-edge clients** spearheading **Ci3** could reap more & faster rewards
- **too materialistic?** Realistic – must convince own stakeholders)

Overview of Overseas Initiatives -

Industry Reform Initiatives and Change Agendas

Why reform?

Looking back ... reform cycles needed, ever since we moved from **Master Builders** - “one-backside-to-kick” to the currently **fragmented** construction industry.

BEFORE - Control was not difficult:

e.g. **Conditions of Contract** –

Hammurabi’s Code (1780 BC) Babylon - interesting comparisons:

229: *If a builder build a house for some one, ... and the house which he built fall in and kill its owner, then that builder shall be put to death.*

230: *If it kill the son of the owner the son of that builder shall be put to death.* (Eye for an Eye? ... Sins of the Fathers ...?)

232: *If it ruin goods, he shall make compensation for all that has been ruined*

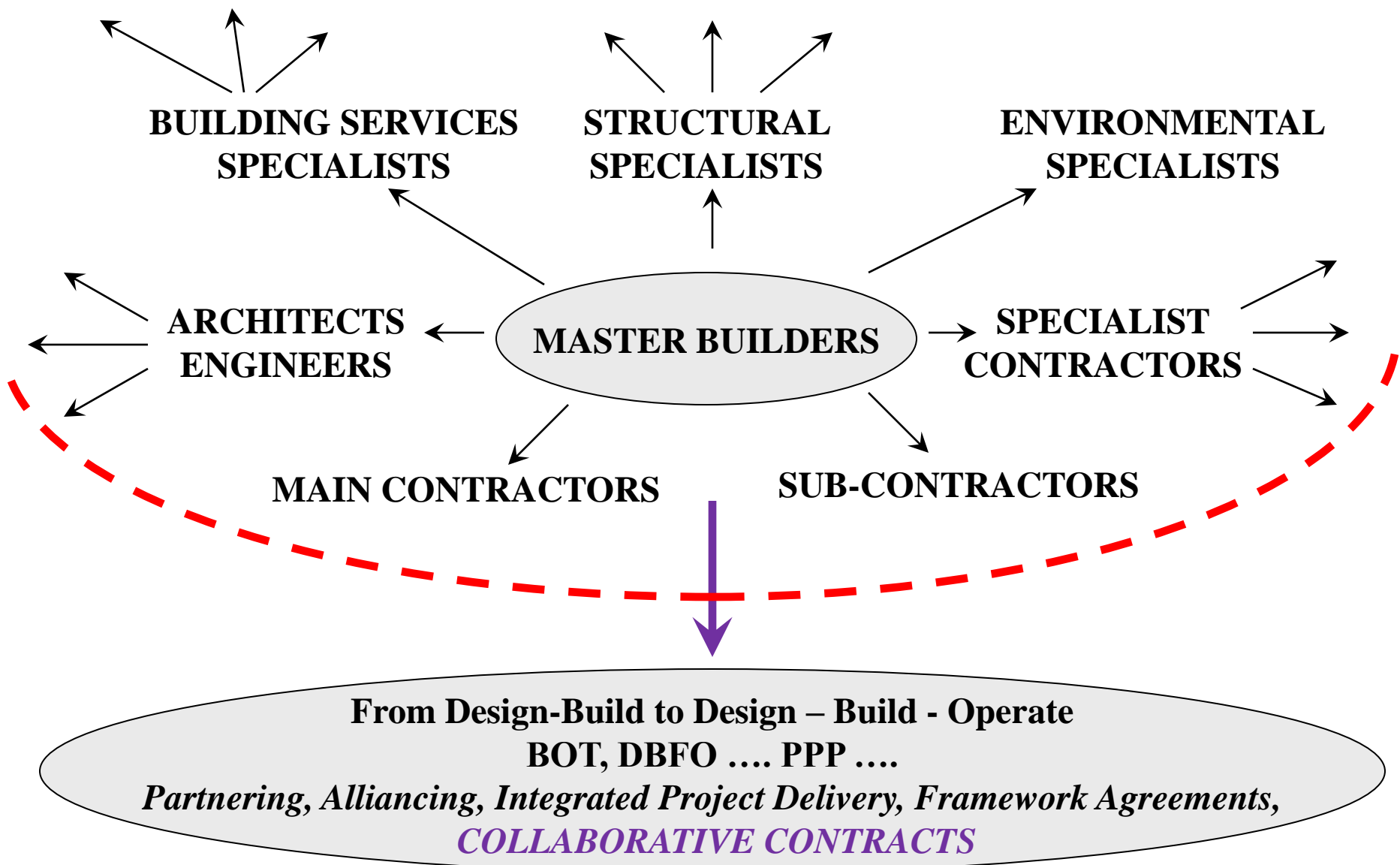
- no arguments, like now, about liability for economic loss!

NOW - desperate attempts with dubious success to re-integrate a segregated industry:

Series of major reports on UK Construction Industry from 1944 – 1998

Simon Committee 1944, Phillips 1948-50, Emmerson 1962, Banwell 1964, Tavistock (Buildings) 1965, Wood 1975, NEDO (**Faster Building for Industry**) 1983, NEDO (**Faster Building for Commerce**) 1988, Latham 1994, **Egan 1998**

- Reform cycles or Vicious circles?



from Fragmented Providers to Re-integrated Teams

Overview of Overseas Initiatives -

Industry **Reform Initiatives** and **Change Agendas**

Construction Industry Reform Reports with Change Agendas in some other countries – examples only:

USA, 1983 – Business Roundtable (Construction Committee) – **‘More Construction for the Money’**, Summary Report of the Construction Industry Cost Effectiveness Project

UK, 1998 - **‘Rethinking Construction’** – ‘Egan Report’

Australia, 1999 - **'Building for Growth'**

Singapore, 1999 - **‘Re-inventing Construction’** – C21 Report

Hong Kong, 2001 - **'Construct for Excellence'** - Construction Industry Review Committee (CIRC) Report

Overview of Overseas Initiatives - Industry Reform Initiatives and Change Agendas – USA, UK, Australia

- **USA, 1983 – Business Roundtable** (Construction Committee) - summarizes findings & recommendations of 23 reports sponsored by Construction Industry Cost Effectiveness Task Force - results represent **views of owners**.

Extract

Chapter 1 - 'THE MYRIAD CAUSES OF DECLINING EFFECTIVENESS' - "United States no longer gets its money's worth in construction **productivity** in construction ... **declining** at a rate many industry leaders find appalling ... '**A Constant State Of Confrontation**' – inordinate fragmentation

- **UK, 1998 - 'Rethinking Construction' – 'Egan Report'**: substantial improvements in quality & efficiency **are** possible – with *committed leadership, a focus on the customer, integrated processes and teams, a quality driven agenda and commitment to people*

Targeted annual reductions of 10% (**30% over 3 years**) in construction cost and time + Reduce defects by 20%
Not achieved, but feeds into ongoing Initiatives

- **Australia, 1999 - 'Building for Growth'**: Scope of industry ... limited to firms directly involved in construction process. Does not recognise significance of **professional and ... building materials sector**. **Not enough attention** to **Institutional arrangements** that shape industry ... **complex regulatory framework**, Institutions which **educate and train** the participants and undertake **R&D**
- **COMPARE Australia, 2014** - 'Productivity Commission Inquiry Report into Public Infrastructure' -

1st of 5 Key themes of Recommendations – Reforms to **Institutional & Governance arrangements !!!**

Overview of Overseas Initiatives - Industry Reform Initiatives and Change Agendas – Singapore & Hong Kong

NOTE: Joint Research project 2009-11 (HKU - HK, NUS, S'pore & Reading Uni., UK)
compared Industry Development programmes in UK, Singapore & Hong Kong

- Singapore, 1999 - 'Re-inventing Construction' – C21 Report –

Transform Industry Image from **3D** (dirty, dangerous, difficult) to **3P** (progressive, productive professional)

39 recommendations under **6 strategic thrusts** -

- (1) enhancing **professionalism** (2) raising the **skills** levels
- (2) improving industry **practices & techniques** (iv) adopting **integrated approach**
- (5) developing **external wing** (6) **collective championing**

Outcomes? Some positives amidst some **shortfalls**

- Hong Kong, 2001 - 'Construct for Excellence' - Construction Industry Review Committee Report

Vision - integrated construction industry ... capable of continuous improvement towards excellence in a market-driven environment

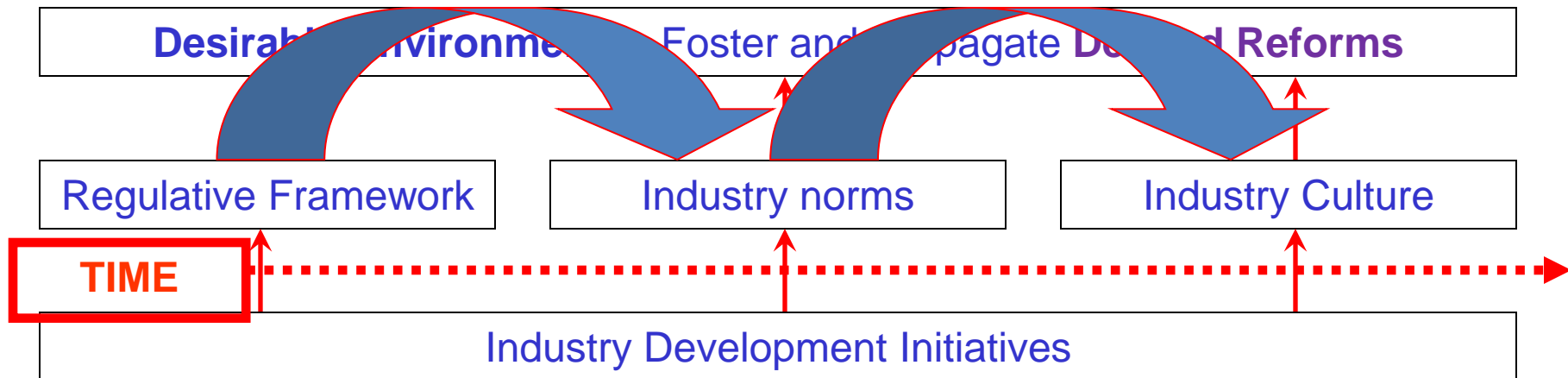
109 recommendations in **6 areas / themes**

- (1) **quality culture** (2) achieving **value** in construction **procurement**
- (3) **professional** workforce (4) **efficient, innovative and productive** industry;
- (5) improving **safety & environmental** performance
- (6) new **institutional framework** to drive implementation of the change programme

NOTE- *Continuity of Work (Steady workflow) is a universal but perennial concern*

HK-S'pore-UK research compared Industry Development programmes through lens of Institutional Theory (using 'culture for 'cognitive')

- Industry development initiatives depend on stakeholder institutions for implementation
- Institutional behaviour is influenced by prevailing (1) **regulative** framework, (2) industry norms (**normative**) and (3) culture (**cognitive**) – relate to **3 Pillars** of Institutional Theory
- Industry development initiatives should trigger changes in above 3 'pillars' to influence desired institutional behaviour
- Regulation (in this context) is usually a last resort [but depends on culture / country?]*
Aim of regulation should be to shape industry norms and culture appropriately



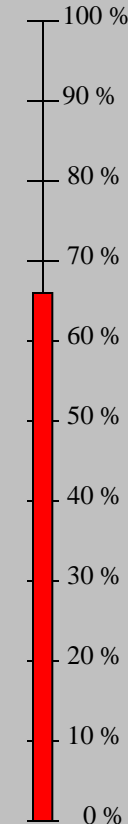
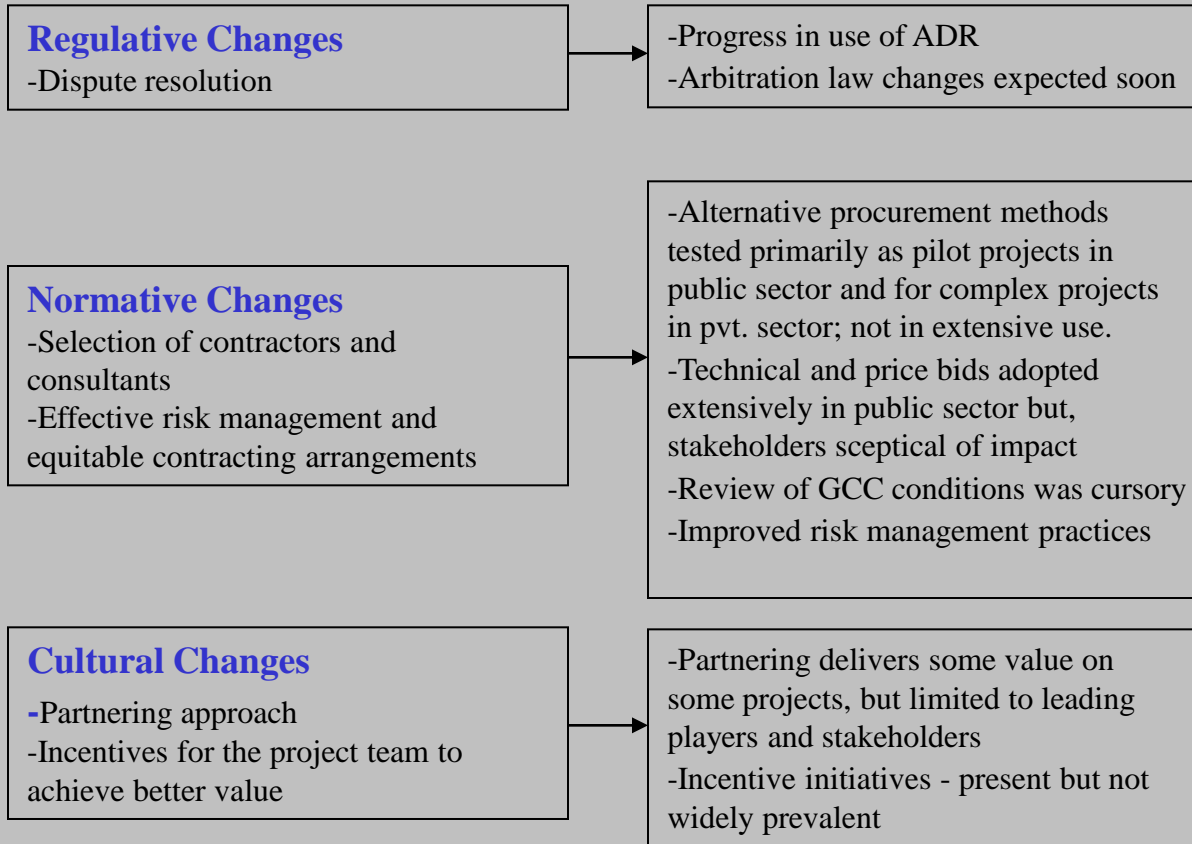
e.g. we found **lukewarm response** to **voluntary** improvement initiatives.
How about INDIA?

Sample Area (similarly for other 5):

Value Through Const. Procurement - Major initiatives

- 2 envelope - **Technical** and **Price** bids adopted extensively but stakeholders sceptical of efficacy and impact
- 3 envelope tendering (3rd envelope – **Innovations** proposals) piloted at HA - initially positive
- Improved risk management practices; e.g. use of Risk Registers, Joint Risk Management in Target Cost Contracts etc.
- Cursory review of Risk Allocation in General Conditions of Contract
- Partnering –mixed results? Added value for some supply chain leaders
- Moves to Contractual partnering - NEC - **now: championed by Govt.**
- Increased and streamlined use of ADR; DRA + **soon: Adjudication**
- Arbitration law - **new Arbitration Ordinance from 2011**

Sample Area: Value Through Const. Procurement - progress review, 2010



- Key Challenges**
- Public sector procurement constraints
 - Tender selection methodology
 - Industry culture
- Key Drivers**
- A committed and enlightened client
 - Incentives to stakeholders
 - Equitable contracting arrangements

Overview of Overseas Initiatives –
Industry **Development Bodies and Reforms Implementation**

Construction Industry Development bodies in some other countries – examples only:

Construction Industry Institute (CII), **USA**

European Construction Institute (based in UK), Construction Industry Institute **Australia** (CIIA)

Constructing Excellence (CE), **UK**

Construction Industry Council (CIC), **UK**

Construction Industry Council (CIC), **Hong Kong**

Building and Construction Authority (BCA), **Singapore**

Construction Industry Development Board, **Malaysia**

Construction Industry Development Board, **South Africa**

Construction Industry Development Authority, **Sri Lanka**

Note 1: We may also compare with **Construction Industry Development Council, India**

Note 2: Above does not include examples of professional and trade bodies and lobby groups
e.g. European Construction Industry Federation (**FIEC**) -

Need for Realistic & Robust Performance Indicators – KPIs - [Examples from Hong Kong](#)

Hong Kong Construction Industry Performance Reports – compiled & issued every 2 years
by Construction Industry Council in collaboration with Rider Levett Bucknall Limited

- **2011 report** available on CIC web-site; **2013 report** being finalised

5 AREAS	4 CATEGORIES	2 SECTORS
<ul style="list-style-type: none"> • Productivity (7 KPIs) • Health & Safety (3 KPIs) • Environment (3 KPIs) • Manpower (3 KPIs) • Dispute Resolution (3 KPIs) 	<ul style="list-style-type: none"> • Whole Industry • Civil Engineering Works • New Building Works • RMAA* Works <p>* Repairs, Maintenance, Additions, Alterations</p>	<ul style="list-style-type: none"> • PUBLIC • PRIVATE

- **REVIEW** commissioned by **CIC** – awarded to **HKU CICID*** - consultancy to review
“Consultancy Services for Assessing the Performance of the Hong Kong Construction Industry, Key Performance Indicators (KPI): An International Comparison”

* **Centre for Innovation in Construction and Infrastructure Development**

Extract: HONG KONG Headline KPIs (*Separately for each Category and Sector*)

KPIs	DEFINITION
P1	(On site) Man-days per HK\$1,000,000 gross value of construction works [PRODUCTIVITY KPI]
P2	(On site) Man-days per gross floor area [PRODUCTIVITY KPI]
P3	Construction cost Indices [KPI of COST TREND OF CONSTRUCTION WORKS]
P4	Percentage of gross value of construction works to GDP [KPI OF THE ECONOMIC SIGNIFICANCE OF THE CONSTRUCTION INDUSTRY]
P4a	Percentage contribution of construction activities to GDP at basic prices [KPI OF THE ECONOMIC SIGNIFICANCE OF THE CONSTRUCTION INDUSTRY]
P5	Gross value of construction works per capita [PRODUCTIVITY KPI]
P6	Number of manual workers engaged per HK\$1,000,000 gross value of construction works at construction sites [PRODUCTIVITY KPI]
P7	Number of manual workers engaged per 1,000 sq. m. gross floor area [PRODUCTIVITY KPI]
HS1	Industrial accident number / rate (reportable industrial accidents per 1,000 manual workers) [KPI OF SAFETY PERFORMANCE]
....

Need for Realistic & Robust Performance Indicators – KPIs - [Examples from UK](#)

UK Construction Industry Performance Report 2015 – based on UK Construction Industry KPIs

Broad Groups of KPIs:

	<u>ECONOMIC KPIs – All Construction</u>	<u>MEASURE</u>
• Economic Indicators →		
• Client Satisfaction	Client Satisfaction - Product	% scoring 8/10 or better
• Contractor Satisfaction	Client Satisfaction - Service	% scoring 8/10 or better
• Profitability	Client Satisfaction - Value for Money	% scoring 8/10 or better
• Predictability	Contractor Satisfaction	% scoring 8/10 or better
• Respect for People	- Performance - Overall	
• Environmental Indicators	Contractor Satisfaction	% scoring 8/10 or better
• Housing	- Provision of Information - Overall	
• Non-Housing	Contractor Satisfaction - Payment - Overall	% scoring 8/10 or better
• Consultants	Defects - Impact at Handover	% scoring 8/10 or better
	Predictability Cost - Project	% on cost or better
	Predictability Cost - Design	% on cost or better
	Predictability Cost - Construction	% on cost or better
	Predictability Time - Project	% on time or better
	Predictability Time - Design	% on time or better
	Predictability Time - Construction	% on time or better
	Profitability [Return on Sales]	Median % profit before interest & tax
	Productivity (VAPE Current Values)	Median value added/ FTE employee (£000)
	Productivity (VAPE Constant 2011 Values)	Median value added/ FTE employee (£000)

VAPE – Value Added per Employee

Note – 2015 Report gives % figures for years from 1999 to 2015 + Trend (vs. 'Last Year' and 'All Years')

Realistic & Robust KPIs? – [More Examples from UK](#)

Similar tabulated Breakdowns of:

Economic KPIs - All Housing

Economic KPIs - All Non-Housing

AND

Respect for People KPIs - All Construction

Environment KPIs - All Construction

Construction Consultant KPIs

Some Highlights from 2015 Report

60% of construction projects are completed **late**. (Note: 55% in 2014, **so worse in 2015**)

Better on '**Cost Predictability**' – on or within budget on 69%

In Non-housing - **design phase** on time in 52% projects; **construction phase** in 45%

Client satisfaction with overall product has fallen three years in a row to 81%

“Overall ...seems construction is making limited progress towards government's

Construction 2025 performance targets

- aim to cut delivery time by 50% and reduce costs by 33%.

Alan Crane: despite rise in the average margin from 2.1% (2014) to 2.8%, profitability remains far below peak of 9.9% in 2009 and 25% of respondents report losses

A view * from Oxford - of Prof Bent Flyvbjerg, *mainly from*

‘What you should know about Megaprojects and Why: An overview’ *Project. Mgmt. Jnl.*, 45 (2), 6-19 (2014)

on why Megaprojects (usually) over-run on Time & Cost

- ‘Iron Law of Megaprojects’ (Bent Flyvbjerg)
 - “over budget, over time, over and over again”
- Why? Propositions of “Optimism Bias”, “Planning Fallacy”, “Strategic Misrepresentation”, e.g. underestimating costs and overestimating benefits
- Attributed to ‘Creative Error’, ‘Downright Deception’etc.!
- Other ‘extreme’ conclusions from above e.g. ‘worst projects get built, rather than the best’ - ‘survival of the unfittest’
- Mayor of San Francisco & former California State Assembly speaker, Willie Brown (27 July 2013):

“News that the Transbay Terminal is something like \$300 million over budget should not come as a shock to anyone. **We always knew the initial estimate was way under the real cost.** Just like we never had a real cost for the [San Francisco] Central Subway or the [San Francisco–Oakland] Bay Bridge or any other massive construction project. **So get off it.** **In the world of civic projects, the first budget is really just a down payment.** *If people knew the real cost from the start, nothing would ever be approved. The idea is to get going. Start digging a hole and make it so big, there’s no alternative to coming up with the money to fill it in.”*
- Flyvbjerg proposes approaches like ‘Reference Class Forecasting’ to address above.

Time & Cost Over-runs in general – some PREVIOUS Global & Regional findings

- **Bad worldwide, but Not all ‘negatives’** (unlike Flyvbjerg’s previous take on Megaprojects) – **Examples:**
- (a) 2011 study of **Australian** infrastructure projects – about **48%** of the sample were delivered on time, budget and to the required quality.
- (b) 2011 study of road and bridge projects in **Massachusetts** - **50%** were over-budget and **33%** were over-run. Implies other were OK!

BUT **what seems not so bad now**, was **not so good, not so long ago**, hence hope of **‘room for improvement’**

Of course root causes & associated difficulties, **differ** across **jurisdictions** / **more complex causal chains**.

- 2014 study (Rosenfield) -146 **causes of construction cost over-runs** - international literature & experts
- **Top three:** (i) **premature tender documents**, (ii) **too many changes** in **owners’ requirements**
and (iii) tender-winning **prices unrealistically low**
- 2012 study (Park & Papadopolou) - studied **35 transportation projects** (1983-2010) in **12 South Asian & East Asian countries:** most significant cause of cost over-run - **‘awarding contracts to lowest bidder**
- 2014 Pilot Study for World Bank in **Sri Lanka** (Kumaraswamy)

(1) **Programme X** (10 complete, of 15 road projects): **EoT:** from: **48.6 %** to **7.5 %**; **Average 28.8 %** (then)

(2) **Programme Y** (12 completed road projects): **EXTREME example**

Cost Over-runs: from **51.5 %** to **132.4 %**, **Average: 86.5 %**

Time over-runs (not EOTs): from **7.6 %** to **180.7 %**, with **Average: 69.8 %**

INDIA ?

Global Construction Disputes Report 2015 – ARCADIS – Extracts only

- based on a SAMPLE on projects & disputes of ARCADIS in 2014

2014 RANK	CAUSE from ARCADIS sample -GLOBAL	2013 RANK
1	FAILURE TO (PROPERLY) ADMINISTER THE CONTRACT	1
2	POORLY DRAFTED OR INCOMPLETE AND UNSUBSTANTIATED CLAIMS	5
3	ERRORS AND/OR OMISSIONS IN THE CONTRACT DOCUMENT	New
4	FAILURE TO UNDERSTAND AND/OR COMPLY WITH ITS CONTRACTUAL OBLIGATIONS BY THE EMPLOYER/ CONTRACTOR/ SUBCONTRACTOR	2
5	FAILURE TO MAKE INTERIM AWARDS ON EXTENSIONS OF TIME AND COMPENSATION	4

2014 Rank- ASIA	CAUSE from ARCADIS samples - REGIONAL	2014 Rank USA, UK
1	A FAILURE TO PROPERLY ADMINISTER THE CONTRACT	4- 1
2	FAILURE TO MAKE INTERIM AWARDS ON EXTENSIONS OF TIME AND COMPENSATION	
3	POORLY DRAFTED OR INCOMPLETE AND UNSUBSTANTIATED CLAIMS	4- 3
4	A BIASED PM OR ENGINEER	
	ERRORS AND/OR OMISSIONS IN THE CONTRACT DOCUMENT	1
	DIFFERING SITE CONDITIONS	2
	FAILURE TO UNDERSTAND AND/OR COMPLY WITH ITS CONTRACTUAL OBLIGATIONS BY THE EMPLOYER/ CONTRACTOR/ SUBCONTRACTOR	3 2
	CONFLICTING PARTY INTERESTS (SUBCONTRACTOR/ MAIN CONTRACTOR/ EMPLOYER OR JV PARTNER)	4

INDIA? Indicative *example* from one RANKING of 'Claims'/ 'Causes of Disputes' – based on 70 survey respondents in Gujarat State - Dr. Rajiv Bhatt et al.

CAUSE 'of Dispute'	RANK
Finance & Payment Issue	1
Poor Work Quality	2
Extra Items	3
Design Errors	4
Work Change Orders	5
Cost Overrun	6
Time Overrun	7
Delay in issuing Site, Drawing, Materials	8
Incomplete information in Tender	9
Mistakes in Contract Document	10

CAUSE 'of Dispute'	RANK
Delay in Clients Response	11
Poor Communication	12
Unforeseen Site Condition	13
Price Escalation	14
Unfair allocation of Risk	15
Return of Security Deposit	16
Inclement Weather	17

Based on 70 responses,
from – 36 contractors, 23 developers,
11 architects

Just as 'no. 1 in Gujarat', **another** Common Cause of Disputes Worldwide - **Delayed Payments** – by **Both Clients** (to Contractors)
and by **Contractors** (to their Sub-contractors) -
trigger **more Delays** & trigger **vicious circles** of more Claims & Disputes

Above led to Security of Payments (SoP) legislation in some countries- e.g.

UK – 1996

NSW, Australia - 1999

Victoria, Australia – *Building and Construction Industry Security of Payment Act 2002*

Western Aust. – 2004(+ other states)

New Zealand - Construction Contracts Act 2002

Singapore - *Building and Construction Industry Security of Payment Act 2004*

Malaysia - *Construction Industry Payment and Adjudication Act 2012*

Ireland - *Construction Contracts Act 2013*

Hong Kong – *planned*, public consultation just finished

Addressing Delayed Payments issues – Proposals for Hong Kong SOPL

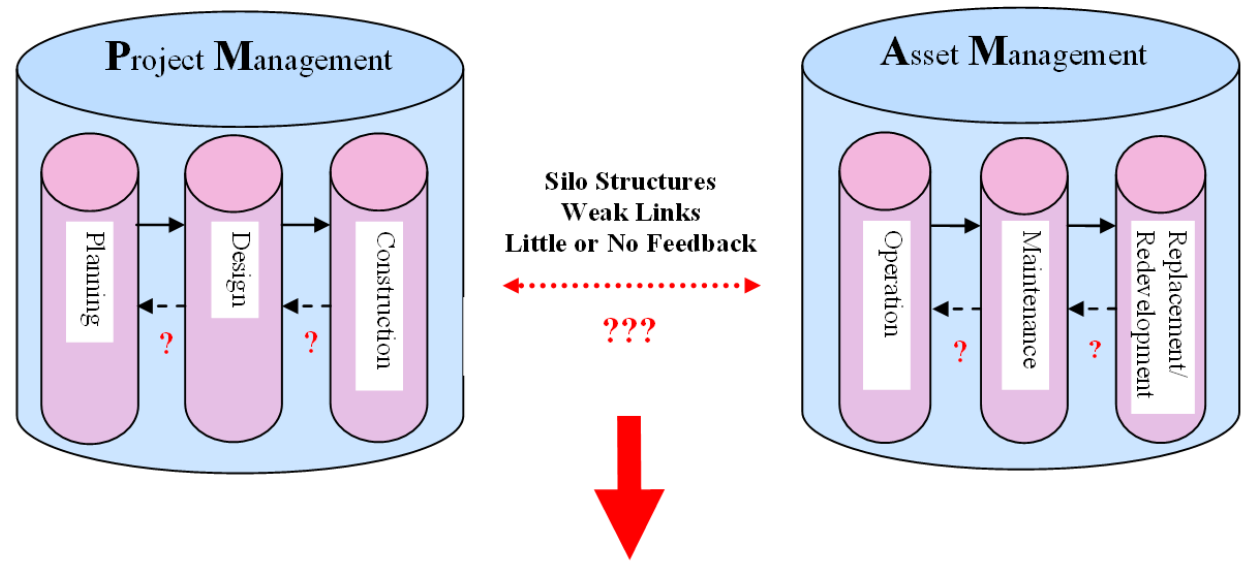
Parties to retain basic freedom to agree payment terms to suit their needs. But with, some obligations, rights and limits:

- ‘Pay when paid’ clauses - **not** be effective nor enforceable
- **Payment periods** can **not exceed** 60 days (interim) or 120 days (final payments)
- Right to dispute resolution by **Adjudication** – **rapid procedure** - independent decision on dispute and any payment
- **Right to adjudication** – if **non-payment** or **disputes** about value of work, services, materials or plant and/or disputes about EoT and financial claims
- **Maximum period allowed for adjudication** - 55 working days unless agreed
- **If either party unhappy with adjudicator’s decision** - right to refer dispute to court or arbitration
But **any amount adjudicator decided as due must be paid in the meantime**
- **Unpaid parties have right to suspend or reduce the rate of progress of work** after non-payment

OTHER ISSUES? Many MISSING LINKS? example: LINK to BUILT ASSET MANAGEMENT?

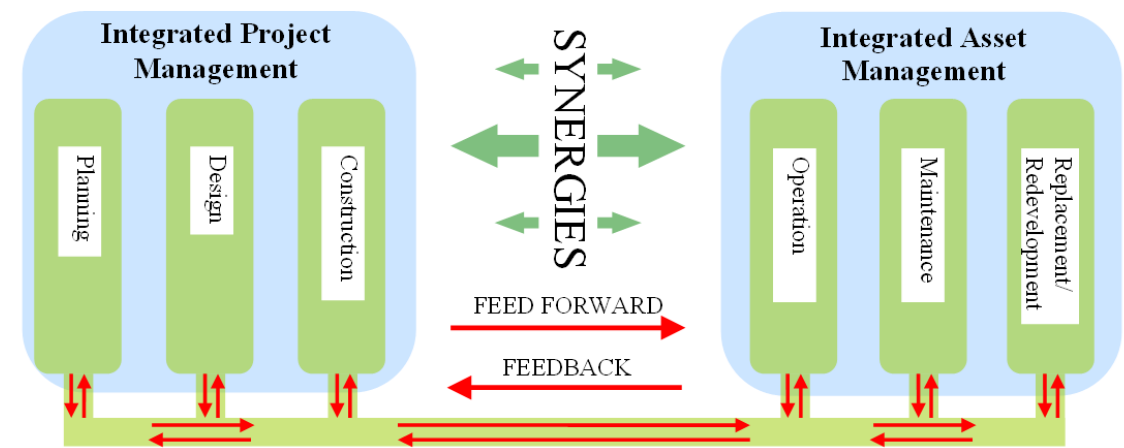
Many Questions ... but Core Question: *How to Move FROM:*

‘One-way flows’ in typical built infrastructure management scenarios



TO TARGET:

Higher Performance & Synergies through Integration & ‘Two-way Knowledge flows’



- **Extends** needs to **Re-Integrate Teams ACROSS** the ‘DIVIDE’
- **Links** to **Collaborative Contracts**
- **Synergises** with **BIM** – for streamlined **Teamworking**

OTHER ISSUES? Scanned **Snapshots** of Selected **Samples** of Some critical ISSUES

To **provoke proposals** on what we really need **here & now**
as well as in **medium term & longer term**

Examples of other Critical Issues?

Selecting / designing **Appropriate Procurement & Delivery systems** –

e.g. 2015 **Deloitte** Access Economics Report to ‘Consult Australia’ on ‘Economic benefits of better Procurement practices’ – reconfirms **imperatives to improve Procurement** – can **reduce project delays** and **improve project quality - by 7 %**

Professionalism, Ethics, (e.g. Transparency, Anti-collusion strategies? and/or

Empowering Innovations – Technology (construction, managerial, ICT, BIM-based ...)

Community Engagement and Stakeholder management

Establishing & Achieving Sustainability targets

Research, Development, Dissemination & Implementation; CPD & Training

.....

Highways, Bridges, Railways
& Metros, Airports, Ports &
Harbours ...

Building
Clients

Power, Industry, Water,
Sewerage & Drainage,
Irrigation & Dams ...

Contractors

Consultants

Sub-
contractors

Suppliers

Ci3

**Construction Industry
Improvement Initiative - India**

from **REGIONAL** - Chennai, Bengaluru ... and Mumbai, Delhi, Kolkata
to **NATIONAL** -

From **Top Tier CITIES** ... to **Next Tier CITIES** ...?