

**International construction – it's all about competitiveness**



Roger Flanagan – University of Reading

**Creating competitive advantage in construction**

- Record of corporate social responsibility
- Political support from government through project creation and export guarantees

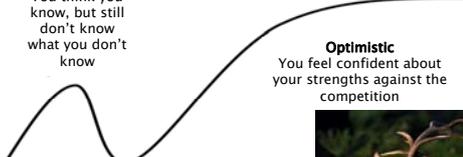



**Competitiveness**



- Competitiveness is fundamental to success; creating new forms of competitive advantage is key
- New players are not hidebound by the traditional competitive models
- It's a fast changing world with the speed of change increasing
- Uncertainty and risk is the problem, in construction we are hidebound by illusions of certainty, then wonder why it went wrong
- Understanding the DNA of the competition is very important

**Looking at competitiveness**



**Naively confident**  
You think you know, but still don't know what you don't know

**Clueless**  
You don't know what you don't know

**Discouragingly realistic**  
You know what you don't know

**Optimistic**  
You feel confident about your strengths against the competition

**Mastery achieved**  
Now you need to stay competitive



**Creating competitive advantage in construction**



- Lowest price
- Consistent high quality
- Customer focused, the customer is King
- Good record for safety and health
- Capable of speed of delivery
- Providing the most attractive project financing package, and guarantees
- Design capability and the capacity to integrate design and production
- Having off-site production facilities and capability to increase speed of production
- Strong balance sheet
- Appetite for risk




The construction sector is trying to fly a Dakota at supersonic speed with systems and procedures that were never designed for speed or turbulence now encountered on construction projects



Timetable = <i>planning production on site</i>	Take off = <i>bid stage and tender</i>	Landing = <i>practical completion</i>
Operating crew = <i>management team</i>	Passengers = <i>client</i>	Fuel and power = <i>money/project finance</i>
Design and production of the aircraft is integrated = <i>Independent design team consultants design construction projects for a fee</i>		
Designed for weather uncertainty with turbulence, wind shear, typhoon, etc. = <i>illusions of certainty in construction, and clouds of uncertainty and risk in construction, often not well forecast</i>		
Performance of the aircraft = <i>productivity</i>	Navigation = <i>form of contract agreement</i>	Landing gear/fit out = <i>specialty contractors</i>

Using the analogy of the aircraft industry

 Early days	 Precision formation
 Speed	 Getting it wrong

The construction sector does amazing things with outdated systems and procedures - we need to move on

- The separation of design and production in construction was never designed for today's complexities, rules, and regulations that thrive on bureaucracy, and liability
- The bidding/tendering system is broken, pricing incomplete information is unrealistic, no plane would fly without full information
- Construction project costing systems are historical, not dynamic
- Cash flow has become critical with payment systems designed for the old world of construction where direct employment was common (without fuel the plane crashes)



 Heavy lifting	 Difficult manoeuvres
 Technology	 Comfort

**Constant change**

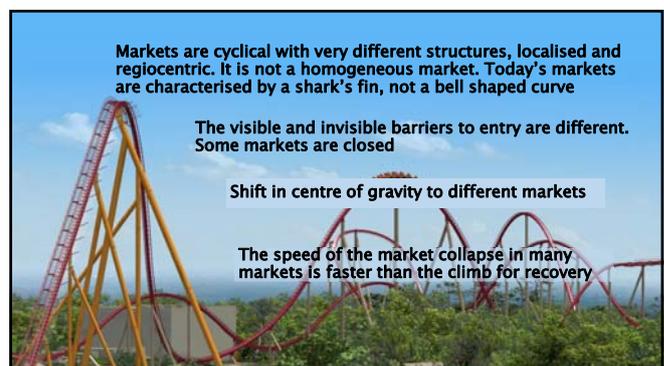
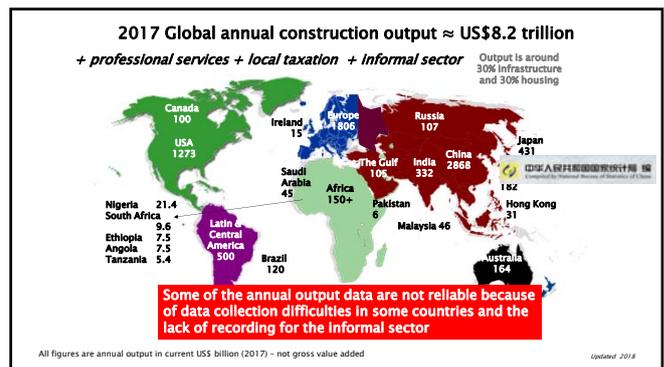
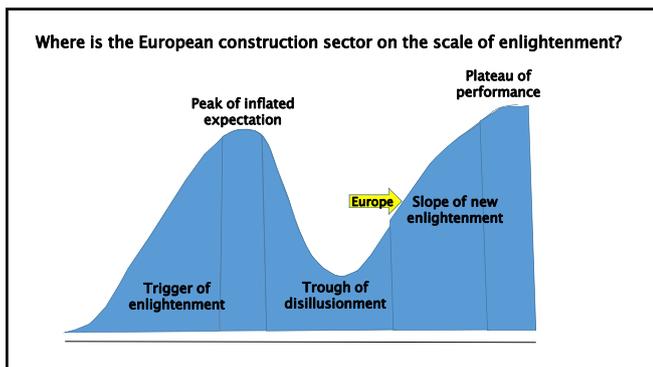
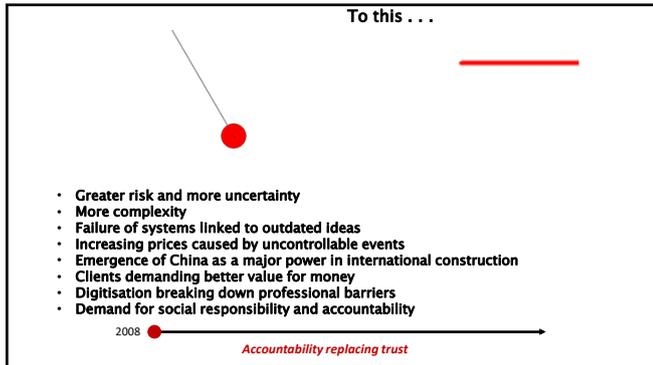
With the rate of change in the local and national construction market and the rapid advancement in globalisation and technology, tomorrow will not be the same as today

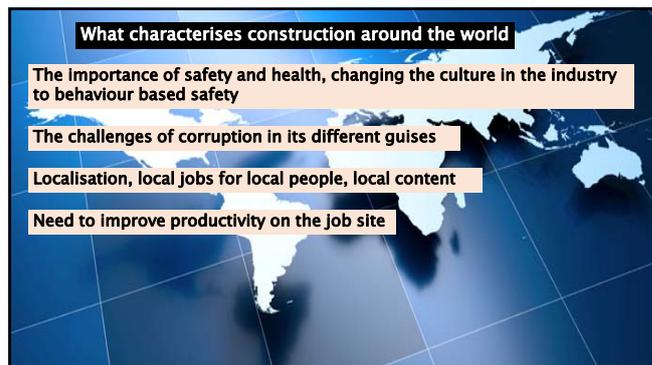
Four or five decades ago, market reactions were more predictable

The challenge is that many of the "traditional systems" used in the industry today were designed for a more predictable industry that was not subject to constant change

Turmoil is not new







<p><b>The developing world :</b>  <b>efficiency/ capacity building/cost challenges</b></p> <ul style="list-style-type: none"> <li>•Rapidly increasing urbanisation</li> <li>•Demand for resilient infrastructure</li> <li>•Climate change</li> <li>•Growth of megacities</li> <li>•Challenge of bankable projects</li> <li>•Growing populations</li> <li>•Over reliance upon foreign aid and finance</li> <li>•Lack of capacity building in the construction sector</li> <li>•Corruption</li> </ul> <p>Annual spend per capita in construction:                  Pakistan US\$70, Nordic countries US\$4,000</p>	<p><b>The developed world faces:</b>  <b>efficiency/productivity/cost/quality challenges</b></p> <ul style="list-style-type: none"> <li>•Demand for more efficient infrastructure services</li> <li>•Ageing infrastructure, the need for repair, upgrading, replacement</li> <li>•Climate change</li> <li>•Growth of megacities</li> <li>•Integration of service for more resilient infrastructure</li> <li>•Better value for money in infrastructure delivery</li> <li>•Higher quality</li> <li>•Projects running over budget and over time</li> </ul>
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**What characterises construction around the world**

The construction sector is one of the most important industry sectors for every country, few governments really understand the dynamics of the sector

Big differences in the spend per capita in construction across the globe – around US\$3,000 per capita in the developed world, around US\$100 in parts of the developing world

Consolidation – the big consultants and contractors are getting bigger through mergers and acquisitions

Projects are getting bigger with more megaprojects, more PPP derivatives, and more demanding clients

More complexity, more risk, and some disillusionment – need to change the delivery mechanism for design and production to give cheaper, safer, and higher quality



**Some mythology and some big questions on competitiveness**

All the Chinese companies behave the same, they use low cost, low quality labour, working in poor conditions. There is no point in trying to compete with them on price in Africa, Latin America, and other parts of the developing world **Wrong decision**

The Chinese model is changing, their labour and overhead costs are escalating rapidly, labour is becoming more expensive and more demanding. Chinese companies are acquiring local companies, and seeking investment opportunities as is happening in the USA, Canada, Australia, and New Zealand

Chinese companies are building a new competitiveness model with investment, and professional services in the mix

African and developing world countries are only interested in low cost, not best value

Slowly, but surely, the message is getting through – quality counts. It won't happen overnight

Corruption in India, Bangladesh, and Pakistan is endemic, yet the Chinese companies seem capable of playing the game

China wants to change the game as well. The State Owned Enterprises are not the same as the Chinese private companies

**Murray & Roberts**  
1902-2017

**Africa's largest international construction company exits construction**

A multinational specialist engineering and construction group focused on the natural resources market sector

27 Nov 2015  
**THE NEWS**  
SOUTHERN PALACE GROUP-LED CONSORTIUM ACQUIRED MURRAY AND ROBERTS' INFRASTRUCTURE AND BUILDING BUSINESS

.... and sells their Infrastructure and Building business for US\$84 million to a Black-Empowered company

The fully-funded purchase

Part of a settlement between the government and SA's seven largest construction and engineering groups for their part in collusion in the run-up to the 2010 Soccer World Cup, which required them to sell at least 40% of their domestic infrastructure businesses to black empowerment partners, or to mentor up to three black construction companies over a period of seven years.

**Disruption and Change**

**FOUR ISSUES IMPACTING CONSTRUCTION COMPETITIVENESS**

**Disruption and change**

**Convergence**

**Risk & uncertainty—more clouds of uncertainty**

**Complexity**

**AVENG**  
Leaders in Infrastructure

Net loss of R347 million- Restructuring

<b>OPERATING LOSS</b> December 2017: R775 million	<b>NET ASSET VALUE*</b> December 2017: R18,05	<b>REVENUE % OF GROUP</b> H1 2018
<b>FULLY DILUTED HEADLINE EARNINGS PER SHARE</b> December 2017: 781 cents loss	<b>DIVIDENDS PER SHARE</b> December 2017: Nil	H1 2017

**GROUP FIVE**  
structured ingenuity

5 largest South African construction companies are restructuring following losses

**Disruption and Change**

Change is happening fast, we have moved from incremental change to continuous change

Acceleration and speed of change

Who would have believed 5 years ago that:

CONCRETE, UNCLEAR, LOST, PERPLEXED, DISORIENTED, BEWILDERED

**Declared bankrupt (Jan 2018), debts of £1.5 billion, taking specialist contractors with them**

**Declared bankrupt, failed to pay workers for six months**

After four decades of building some of the country's iconic structures. Saudi Arabia, Saudi Oger ceased trading on July 31, 2017

Balfour Beatty's construction services division has now lost £774 million over the past three years.

**OHL** One of the largest Spanish contractors  
Sold the concessions business stream to provide cash (Dec 2017)

**UK largest construction firm. Turnaround from loss to small profit (declared March 2018)**

Group pre-tax loss for 2015 was £199m. The equivalent figure in 2014 was just a £59m loss, but only thanks to the £246m banked from the

**Disruption and Change**



**Fletcher**  
The leading contractor in New Zealand and the South Pacific.

The South Pacific's largest construction company, Fletcher Construction is withdrawing from building projects following profits warnings and losses of NZ\$454 million in 2017, and NZ\$292 million in 2016

China State Construction enters the New Zealand market with major projects for Chinese investors



**CCCC acquired John Holland in Australia for US\$642 million to become a major player in building and infrastructure delivery in Australia**

China's CCCC Buys Aecon for CAN\$930 Million in Canada Nov 2017

**FINANCIAL REVIEW**

China-owned John Holland aims for apartments, hotels and infrastructure

**Disruption and Change**



**Disruption and Change**

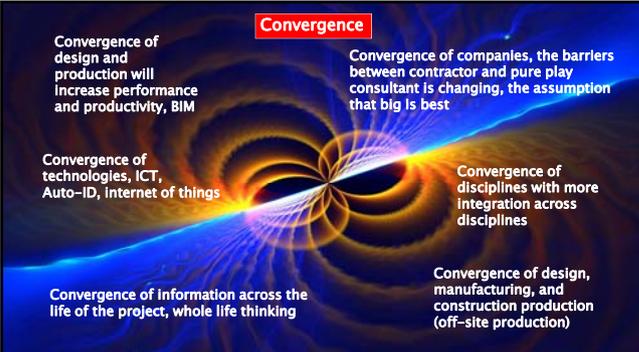
**REUTERS**  
Brazilian firms to pay record \$3.5 billion penalty in corruption case

**Odebrecht, the largest engineering and construction contractor in Latin America with 128,000 staff fined US\$3.5bn for bribery and corruption.**

Now being restructured

Odebrecht had a department dedicated to bribes, known as the Division of Structured Operations. Half the company's workforce has been laid off

**Brazil**



**Convergence**

- Convergence of design and production will Increase performance and productivity, BIM
- Convergence of technologies, ICT, Auto-ID, Internet of things
- Convergence of information across the life of the project, whole life thinking
- Convergence of companies, the barriers between contractor and pure play consultant is changing, the assumption that Big is best
- Convergence of disciplines with more integration across disciplines
- Convergence of design, manufacturing, and construction production (off-site production)

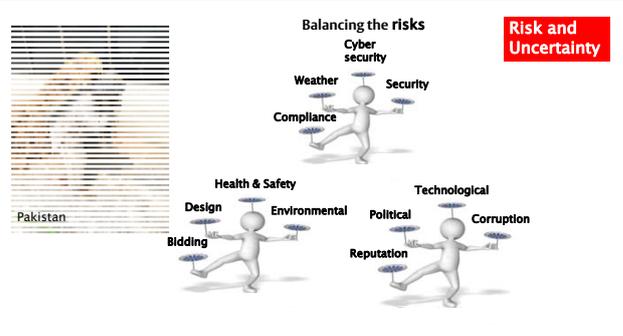


Andre Gutierrez and OAS, two of Brazil's largest construction enterprises also embroiled in Operation Lava Jato (Car Wash)

OAS had 100,000 staff, files for bankruptcy protection and restructuring

**AG ANDRADE GUTIERREZ**  
Founded 1948

Company being restructured. Fine still outstanding, originally seeking was US\$12 billion, but recognising it would bankrupt the company!



**Risk and Uncertainty**

Balancing the risks

- Cyber security
- Weather
- Security
- Compliance
- Health & Safety
- Technological
- Design
- Environmental
- Political
- Corruption
- Bidding
- Reputation

Pakistan

**Risks have a unique sequence, rather like DNA**

**Risk and uncertainty**

Very rarely are they linear and it is difficult to forecast at the bid stage

Path dependency is an important aspect of risk

**THREE PROPOSITIONS**

**Accumulation risks**

**Risk**

Trigger

**PROPOSITION 1**

**NEW MODEL FOR COMPETITIVE ADVANTAGE IS NEEDED**

**CREATING COMPETITIVE ADVANTAGE IN THE INTERNATIONAL CONSTRUCTION MARKET HAS CHANGED**

Design and engineering professional service firms will increasingly move into the construction/production space

Chinese construction firms are benefitting from the close links between investment/finance, political influence, and construction. They are becoming more efficient, also more productive with new digital technologies. The best are very good, the weak are very poor

European construction enterprises must respond by changing the delivery model by embracing the supply chain in a different fashion  
We make a decision based on price, quality, safety, technical advantages, specialization, social responsibility

Unclogging the pipeline of work

**Everything we do has become more complex**

**Complexity**

Swiss cheese model – gaps created across the supply chain and project time horizon

The traditional methods of managing big projects were not designed for current risks and such dynamic interconnectivity

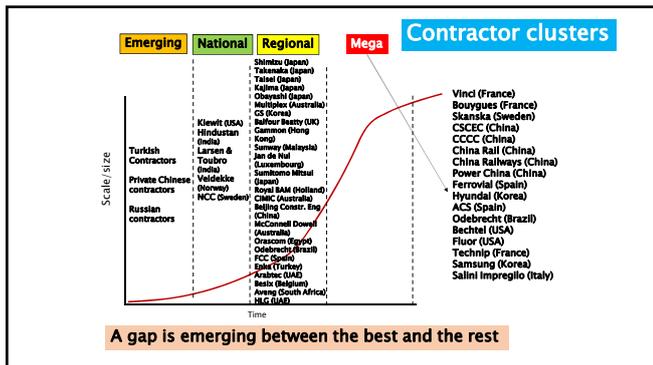
The problem with risk is non-linearity, interconnected events bounded in complexity

**Consolidation across the engineering and construction sector**

**17 of the top 50 are from China**

**The 2017 Top International Contractors 2017**

RANK 2017	RANK 2016	FIRM
1	1	CHINA STATE CONSTRUCTION ENGINEERING CORP. LTD., Beijing, China
2	2	CHINA RAILWAY GROUP LTD., Beijing, China
3	3	CHINA RAILWAY CONSTRUCTION CORP. LTD., Beijing, China
4	4	CHINA COMMUNICATIONS CONSTRUCTION GROUP LTD., Beijing, China
5	6	POWER CONSTRUCTION CORP. OF CHINA, Beijing, China
6	5	VINCI, Paris, France
7	7	ACS, ACTIVIDADES DE CONSTRUCCION Y SERVICIOS SA, Madrid, Spain
8	8	CHINA METALLURGICAL GROUP CORP., Beijing, China
9	10	SHANGHAI CONSTRUCTION GROUP, Shanghai, China
10	9	BOUYGIES, Paris, France



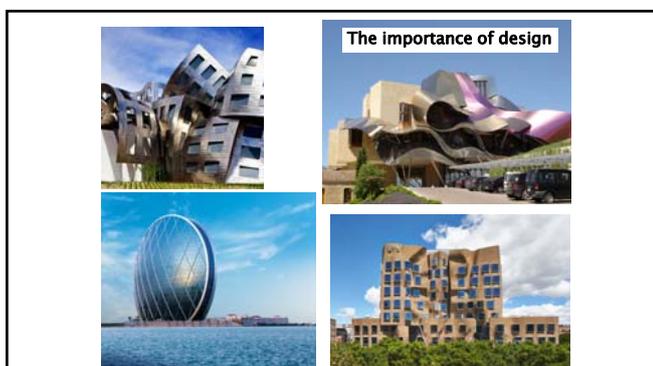
**What characterises engineering and design consultants?**

- Consolidation - mergers and acquisitions with the big getting bigger
- Diversification into engineering sectors, such as aeronautical, automotive
- Geographical spread
- Scale, some have become too big to survive as an independent design consultant selling soft services



**What characterises engineering and design consultants?**

- Embracing digital engineering
- Integration of design and production
- More commercial, desire for profitability
- Rise of the Starchitect
- Absence of Chinese consultants, but that will change
- Asian consultants getting a wake up call



**Starchitects/designers have been successful in winning major projects, they developed reputations for design excellence and project delivery**

There are very few big name China designers

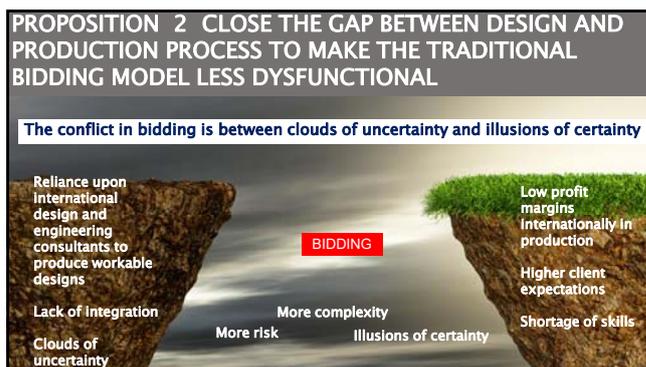
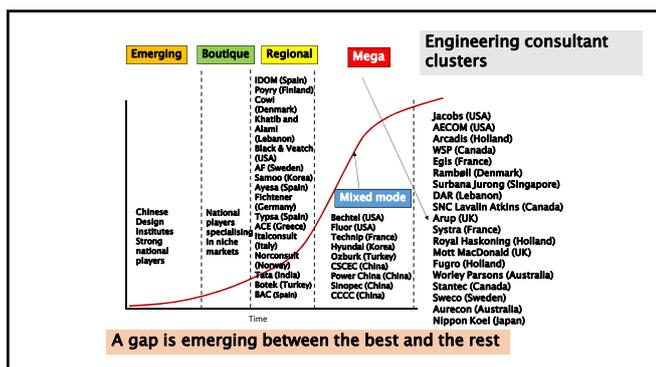
**Consolidation across the design and engineering sector**

**The 2017 Top International Design companies**

RANK 2017	RANK 2016	FIRM	FIRM TYPE
1	1	WSP, Montreal, Quebec, Canada†	EC
2	5	AECOM, Los Angeles, Calif., U.S.A.†	EC
3	2	ARCADIS NV, Amsterdam, The Netherlands†	EC
4	4	JACOBS, Dallas, Texas, U.S.A.	EAC
5	3	WORLEYPARSONS, North Sydney, NSW, Australia	EC
6	7	DAR GROUP, Dubai, U.A.E.†	EA
9	6	FUGRO NV, Leidschendam, The Netherlands	EC
10	15	WS ATKINS PLC, Epsom, Surrey, U.K.	EC
11	10	TECNICAS REUNIDAS, Madrid, Spain	EC
12	13	CH2M, Englewood, Colo., U.S.A.†	E
13	9	MOTT MACDONALD, Croydon, Surrey, U.K.†	EC

**No pure play Chinese consultants are in the top 50 (one contractor (CCCC))**

**CH2M now part of Jacobs  
DAR Group share ownership in Worley Parsons**

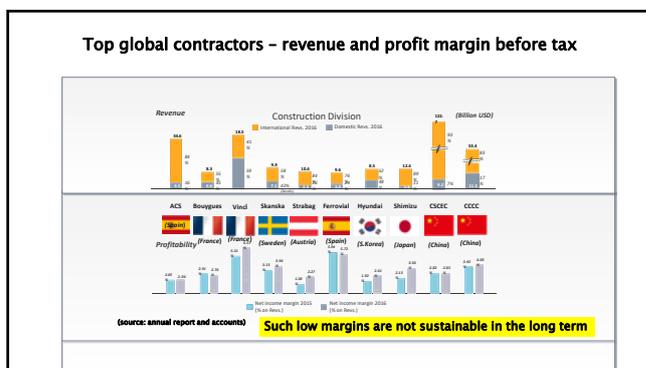


**PROPOSITION 1**

**Understand**  
We need a much better understanding of the DNA, the drivers, and the business model of the competition. Do not assume that because they are a contractor, they have the same systems and approach.

**Embrace co-opetition**  
Develop a different approach to dealing with the Chinese competition. Embrace and use their supply chains, look at collaboration with suppliers, manufacturers, and component teams. Embrace co-opetition.

**Change the game plan**



**We need to fill the gap at the bid stage between design and production, with new approaches and a more systemised approach towards estimating**

**Treat the bid phase as the most important part of the whole process**

**PROPOSITION 3 COMPETING ON A LEVEL PLAYING FIELD**

This is how we are all playing at the moment in the developing world  
Even the developed world pitch is getting bumpier

**We need to think about how we compete in the dynamic and changing market. There needs to be a level playing field with a new rule book for delivery**

<p><b>Environmental responsibility</b></p>	<p><b>Social responsibility</b></p>	<p><b>Code of behaviour for interim and final payments, retention payments, and final account settlement</b></p>
<p><b>Ethics and compliance</b></p>	<p><b>Quality</b></p>	<p><b>Looking after the customer</b></p>
<p><b>Safety and health</b></p>		<p><b>Managing and protecting information and data</b></p>