

Rethinking how capital programmes are delivered

Report of the ECI Conference held at the offices of Fluor, Amsterdam, on 3 October 2018

1. Background

This conference built on the work programme of ECI during 2018, which has focused on the challenges faced across Europe in the engineering and construction sector, including:

- Projects with sanctioned investment becoming unviable,
- Rising uncertainty about project outcomes related to cost, completion dates, start-up and plant performance and reliability,
- Frequent disputes and major cost and delay claims that challenge resolution without arbitration or litigation
- Difficult relationships between project teams and contractors.

Industry leaders have expressed deep dissatisfaction with current ways of working and are hungry for a different approach. ECI has been working with the Construction Industry Institute in the USA on such a new model, which embraces the opportunities afforded by digital technology to improve capital project outcomes. The conference shared thinking on this model as well as perspectives particularly from large owners, users and clients of the sector.

2. Introduction

Don Ward and John Fotherby, chief executive and chair respectively, welcomed delegates to the conference and set out the context and objectives for the day.

Key comments including in discussion included:

- We need to re-engineer what we are doing, we are only completing one third of projects successfully. The developed world needs investment to renew infrastructure, and there is not enough money to do it. The developing world needs new infrastructure, and the industry is under-prepared to deliver what is needed, this demand a on industry to step up and think about and deliver much higher value.
- Can it be allowed to just drift in the old way. How is money obtained? How is the long-term attitude of the Chinese affecting the industry? How about the US? A crumbling infrastructure – needs to change what it does.
- There is a need for radical change. The market is huge, there are major investments ahead in the developing world and in brownfield projects in the developed world. Lots of money is going into other industries that are more attractive than ours for investors.
- The traditional EPC way is fundamentally flawed, surely we can't continue to go that way. For example, P&G is moving towards a lean approach, have piloted lean IPD (integrated project delivery) successfully and are benchmarking with BMW in Munich. \$2 billion in west Virginia – mid stream switch to an IPD approach, and achieved much better project outcomes, greater value, happier teams. A contract that incentivises performance and quality was key. Consequently, no wish to go back to the traditional ways of working.

3. The view of the owner-operators

3.1. 2018 Roundtable

On the previous day ECI had facilitated a Clients/Owners' Roundtable with the support of McKinsey & Company and Shell. Frank von Willert of McKinsey presented a summary of the main conclusions to the conference – see the separate report of this event entitled “The 2018 ECI roundtable for Owner Operators and Investors in the European engineering and construction sector”¹.

The headline conclusions from this roundtable were:

- Capital efficiency and the need to work together better as a sector to address it remains the number one issue for clients;
- The crisis led to incremental improvement but not transformational change;
- Competition for capital has increased while project performance has not;
- Industry-level standardisation could eliminate a lot of waste but remains elusive;
- Banks assert more control and drive risk further down the supply chain, increasing cost;
- Many companies still fail to capture lessons learned and transfer knowledge to new projects.

The discussion had identified several familiar themes for improvement, under three main headings, which require articulation of a clear road map to go from today to a different way of working:

- More collaborative contracting/alliances;
- Harnessing the full power of innovation and digital technology to enable structural transformation of how projects are delivered;
- Sector-level standardisation of processes and requirements.

3.2. Paul van Weert, Global EPC Manager for Shell

Paul van Weert, Global EPC Manager for Shell, gave his perspective on these challenges and opportunities, comments included:

- The current path is not sustainable;
- Projects are highly bespoke, including team relationships, which are highly transactional;
- They have seen a decrease in productivity in the last decade;
- No-one is sitting on a big pot of money ready to give it away without a clear ROI;
- Lots of inefficiencies in the supply chain – “technology has introduced more complexity rather than becoming more efficient”;
- Increased use of digital, including digital twins through all stages of the project. Lots of opportunities in the digital space for re-organising construction;
- As a company, Shell is still committed to providing energy to the world, still committed to \$25B/year investment – with “a hard ceiling, soft floor” attitude to sanctioning investments

In summary, a step change in the way we do projects is needed to secure improvement of 30-50% in cost and 30% in schedule. That won't be achieved by squeezing margins of suppliers but needs deeper collaboration, specific suggestions included:

- More rigour in scoping projects;
- Rely much more on what industry has on offer, standardise, less prescriptive standards from the client;

1



- Digital – digital twin building up from design thru construction to operation phase.

The expectations of suppliers who work with Shell (“partners”) include:

- Safety;
- More innovation, especially on the above themes;
- Cascade to their own suppliers, equipment/parts/materials suppliers etc – the whole supply chain needs to be transformed.

At the same time, suppliers can expect from Shell:

- Changing the way we work together – respect margins and profitability;
- Profit margins – strive for double whilst reducing hours by say 50%;
- Walk the talk – feedback where Shell is not meeting expectations;
- Open dialogue, more collaborative ways of working.

Where are Shell on this journey over the last 2 years?

- Much better at dealing with ‘shipwreck’ projects’
- Recently sanctioned projects show better performance’
- Much less traction on transformational change, but bright spots include:
 - Good progress on scoping rigour, eg Mexican Gulf,
 - Industry solutions,
 - Collaboration space.
 - Shell defines journey as A -> B -> C, for each sector that they are in, eg LNG;
 - From A starting point, to B top quartile, to C most competitive across industries – in order to win capital investment.

The big questions remain:

- How can we set up new projects for bigger transformational change?
- With the digital tools available now, why are sites still so low-tech? For example, still using paper in a plastic folder onsite for documents and drawings as per 30 years ago;
- Better commercial models.

4. Project collaboration – a toolkit and case studies

Andy Brown of ECITB presented on the ECITB collaborative toolkit and the related case studies.

Comments included:

- Integrated project delivery (IPD) – Mike Staun of Procter & Gamble spoke in glowing terms of the impact on their business, and subsequently made available for circulation to delegates an internal business case document ² ;
- Behavioural KPIs – do you measure behaviours and how can you share that?
- Working collaboratively versus contractual frameworks. Different project deliverables needed to meet the project schedule. More complimentary than contradictory. Incentive schemes not a guarantee for success. Such massive gains by working together, more than enough for everyone to succeed.

2



The Business Case
for Lean IPD-25Oct20:

- Begs the question of why you would not want to collaborate? Why have we not used previous tools? Why aren't we more pro-active? How do these models translate in a contractual landscape?
- How do we bring people in and then keep them on the project? What about target cost? P&G are using this in West Virginia, an overspend will impact suppliers' profit before it impacts on the owner. P&G version using industry standard rather than developing their own way of doing things.
- A lot of good stuff applies regardless of the contract form – looking at how we can work more effectively together. It's about respecting contractual boundaries – not playing with contractual terms, accept contractual terms. Stop arguing about legal quibbles – might win the argument but damage the project. A lot of it is about respect.
- Early involvement can only work in specific contract forms.
- Free consulting and design – leads to undercut by people who do not carry the costs and overheads.
- How to select the right collaborative partners – a very different challenge to commercial and technical evaluation of proposals.

5. CII's OS2/'Prairie Dog' project

Stephen Mulva, Executive Director of CII (Texas University in Austin), presented on progress with this large research and development programme which seeks to address the need for disruption and transformation. Comments in discussion included:

- US Government does not fund research related to construction and innovation. CII fills the gap of lack of R&D collaboration. Europe is fundamental to every project around the world – products, design etc. Companies and industry groups – level of interest.
- Prairie Dog – analogous to Android, an ecosystem to develop applications to be put on the platform – innovation and ingenuity is lacking in the industry.
- How can we use blockchain to fundamentally rethink – e.g. how long does it take to do purchase orders, how do we do it more effectively? Rather than doing the mundane stuff, digitise that and let humans focus on the exciting stuff.
- Get into things like leasing – need to provide quick wins in 3 years. Owner needs to find a smaller proportion of upfront capital.
- Not a healthy industry – top 7 engineering and construction firms average 1.8 % profit. Not enough to invest in your technology. Beat a dollar or Euro out of the supply chain.
- Make things smaller – 20 little facilities, each is easier to build, creates redundancy and can take 1-2 offline for maintenance – opens up lots of opportunities as well. Un-investable business... Crowd sourcing projects – financial vehicles. Best practice improves things but how do we break out to disruptive practices?
- Let the computer track and take care of tax advantages and trade advantages.
- Balance sheet and strategy becomes better. Better product at lower price. Nobody retains equity.
- Project 13 Separates investor from the owners. Very owner centric – highly focussed on the owners.
- OS 2 looking at lot of finance of projects – lots of people look at other activities.
- Challenges with leasing on very specific buildings. Goes off owner balance sheet as a liability and onto the providers balance sheet as an asset.
- Figure out the right interface between technology and people and the work they are doing today.
- Do a better job of design re-use
- Move away from pay by the hour – pay on ROI perspective.

- Design kits - the IP lawyers need to get out of the way. More functional spec rather than technical spec. By the hour want to start from scratch. Engineering firms can license designs and technologies. Small stuff can be manufactured.
- Need step by step instructions – digitise.

What can improve performance?

- Need to share both risk and profit
- Identify KPIs as agents of change
- Culture of contractual relationships
- Consider appropriate design maturity
- Client leadership to adopt alternative models
- Why do targets cost contracts fail? Lack of team support
- Contract commercial alignment – keep it transparent and simple
- Collaborative contracting models
- 'If the ecosystem is healthy risk will look after itself'
- Clear mechanism for dispute resolution
- Contract commercial alignment – Keep it simple and transparent
- Need to identify new types of investors
- Incentivisation aligned to operating performance
- How to implement new ways of operating – lean IPD / prairie dog / smaller scale pilots
- Make the existing ECI and Active uses cases visible – we have 20 + years of proof that collaborative project alliances work
- The Contract Matters – Collaborative enables flow – Flow delivers value – Takt (FLOW BIM) – BIM supports collaboration – no more command and control
- Resource efficiency vs production efficiency.

5.1. Feedback on key aspects

Working in small breakout groups the conference addressed key themes in more detail to inform the development of the initiative.

5.1.1. HR Training and Skills – Qualifications and Safety

- Challenges the notion of tax friendly environments and pushing work to where the best tax relief is. Geography culture and political variances. Balance with local content requirements, balance with tax benefits through using platform.
- Dispersed use of workforce – workforce assurance – barriers and control over dispersed factory – how do you enable that to happen? – a global ECITB competence regime.
- Project teams need decision support, rather than relying on experience.

5.1.2. Contracting aspects

- Duplication across contracting structures.
- Easier to achieve in localised settings – e.g. combination of national structures coming from a similar
- Projects undertaken by multinational joint ventures. Client imposing contracts rather than contracts supply chain.
- Tech companies gone to quite simplified modules – platform needs to be sensitive to local customs, norms and legal framework.

5.1.3. Technology Platform

- It is the right direction, right concept
- Struggle to see how we get from where we are now to where we need to be

- Explain what people would do and what they would do differently, help take people along on the journey.
- Clear hierarchy in the conventional system – who sets the rules and who takes the lead.
- Working differently together – get different disciplines together – do not necessarily innovate together.
- It may not work smoothly the first time – not the kind of investments you want to take risk on.
- Suggestion – create a safe space with different parties with a pilot as a research project and look at how to do it differently.

5.1.4. Finance

- Leasing – how do we spread capital cost over time to avoid large spikes at the beginning? How do you move that into the more specialist engineering parts? Specialist packages leasing models
- If you build up approaches, need a specific approach to see different models where you can get ideas from outside for how to finance technology
- Get lots of creative ideas from the market place.
- New accounting looking at important areas of tracking progress and allocating costs. Project control methodologies are from 1950s and 1960s. Revenue recognition is quite antiquated.

6. The younger generation's view

Robin Lapish of HS2 in the UK presented briefly on the perspectives of the early-career generation in his capacity as co-chair of G4C, the Constructing Excellence UK-centric young generation network Generation for Change. This was welcomed by the conference, and the Construction Users Roundtable highlighted a similar Young Professionals Group in the USA which focused on succession planning of the industry, new ways of working, and new thoughts. It was agreed to connect the two to facilitate a conversation and explore possible collaboration.

Other comments included:

- Accelerating careers into leadership positions, a difficult time because of changing demographics.
- Lots of gender diversity in the younger cohort, including culturally, gender and ethnicity.
- Reverse mentoring – have considered it but G4C has no structured programme.

7. Key takeaways

Participants were asked to summarise their main takeaways from the conference, and reported as follows:

- Speed up on BIM / collaboration
- Over-thinking the role of EPC contractor
- Collaboration works, but if it doesn't deliver all the outcomes first time, learn, refine and improve again
- New financial /accounting models – follow up with finance, legal and purchasing teams to develop opportunities for our company
- An interesting update on Prairie Dog
- New ideas for successful project delivery and opportunities for 30% reductions in costs and schedule on projects
- A lot of good energy and requirement for change
- There is opportunity for change and better outcomes – it just takes a first step
- Surprised that owners often start with a blank sheet of paper and glad that is changing

- Need to rethink capital programmes – accelerate project and reduce cost
- Need for greater collaboration and transparency between owners and contractors
- IPD is a good start in the right direction
- The project collaboration toolkit will be a great resource to apply during project execution
- Validated the challenges facing the EPC industry are similar across business units and regions
- Good reflection of the challenges facing the industry
- OS2 / Prairie dog has a lot of potential but concept needs to be fleshed out in next phase of development
- Take back to peers – the power of collaboration, whatever the contractual framework
- Integrated project development promoted through owners
- Simplified contracting key to the project platform.
- Owners need to drive the change
- Very helpful to hear where the industry is at in Europe and see that the challenges mirror those of the rest of the world.

8. Next steps

The following actions were agreed for the next period up to the next ECI event in spring 2019:

- 1) Circulate collateral from the conference
 - The conference slides (with speakers' approval)
 - Reports of the proceedings including the previous day's Client Roundtable
 - Any other content that speakers wish to circulate (web links)
- 2) Extend consultation with Clients/Owners/Investors
- 3) Progress ECI mini-projects re OS2 in Europe:
 - Investors' views
 - Digital
 - Sustainability.
- 4) Confirm with every member and non-member how they would like to participate
 - Invite interest to join the Executive Steering Group
- 5) Target to formalise our plan with CII by end 2018
- 6) Forthcoming events
 - Nov 13 ECI 'fitness for purpose' workshop with Kingsfield - London
 - Nov 22 Kingsfield/Squire Patton Boggs workshop supported by ECI - Birmingham
 - Dec 12 Constructing Excellence annual conference (free to CE and ECI members) – Tower of London
- 7) Membership campaign – reduced fee of £3,000+VAT (€3,300).

European Construction Institute (ECI)
c/o BRE, Bucknalls Lane, Watford, Herts, WD25 9XX
Customer Services: +44 (0)3330 430 643 eci@bregroup.com

November 2018