Rethinking Capital Delivery Projects – Moving Forward

ECI members Forum, London, 3 May 2018

Some 30 ECI members got together in London on 3 May to review the proposals developed at the event in Amsterdam on 21 February to support CII's work programme "OS2" and to consider how best ECI should align to this programme to support the development of better capital project delivery.

John Fotherby, Chair of ECI, opened the meeting, with a call to action for ECI members to deliver meaningful action in the field of capital project delivery. The Executive steering Group had agreed that the existing direction groups should finalise their activities and publish the excellent data and outputs they have been working on, and then dissolve, unless they saw an opportunity to align to the new vision of OS2.

Stephen Mulva, from CII, provided an overview of the latest thinking on Operating System 2.0 (now named Prairie Dog). Stephen considered how the industry could become more efficient through making better use of both capital and technology in order to unlock a better functioning industry based on a single industry business platform.

The meeting discussed the 16 considerations which had been identified by Stephen in a paper which had been previously circulated – see Appendix 1 - with much lively debate around the many issues and where Europe can really lead and deliver meaningful impact.

It was agreed that the following 3 areas would be focussed upon, with an outline research question to be developed ideally by mid-June.

Investors

Lead: Frank-Peter Ritsche, Thyssenkrupp, Ray O'Connor, Squire Patton Boggs + Alliance Manchester Business School

In many of the areas of risk and surety and innovative models of finance and insurance, Europe is leading through the financial centres of London, Paris and Frankfurt. Across the entire value chain of engineering – construction – operations – maintenance the group considered how risks get transferred and to whom. They proposed a series of interviews with investors and their stakeholders, addressing the following questions:

- What are the barriers to speedy decisions and reducing the cost of financial instruments,
- Views on the existing delivery model and what [they] can do to help improve it,
- Views on the 16 themes of OS2.0,
- View on what ECI can do to improve model / processes.

Digitalisation

Lead: Mike Mungall, GSK

This group discussed the amount of data that is created at the project development stage and questioned how data can be transferred to the operations side of things in order to create value for operators. They also considered how solutions can move from niche proof of concept to mainstream implementation.

- How is digital content transferred through the operational end.
- How does digital relate to total cost of ownership?

- Culture
- Legal
- Technological

- How is digital content transferred through the operation end?
- How can we leverage big data and the opportunities that come from it?

Sustainability

Lead: Ian Nicholson, BRE

- This group discussed the need to look at how sustainability in both the economic and environmental sense can be applied in the sector. Including how principles such as circular economy and the 'Save Carbon Save Cost' principles of the Green Construction Board, which has demonstrated real value in the Infrastructure sector.

Further information

For further information on the ECI or this programme of work, Alison Nicholl on alison.nicholl@bre.co.uk

Appendix 1

CII considerations in developing a new business model for our industry (OS2.0)

Stephen Mulva, CII, April 2018

The following have emerged from ongoing R&D and conversations that we are having with CII members and affiliates in North America and other places around the world.

1) Transitioning to a leasing model

The goal here is to drastically reduce first cost by leasing an asset's products and services over its lifecycle. $50M per year over 14 years instead of $500M today. This greatly differs from PFI or PPP which seek to finance the asset's large first cost over a number of years so that the project itself can repay the investors. Here, we're talking lots (hundreds, thousands) of small deals on most or all of the components in the completed asset. How do the incumbent providers transition from a "cash-up-front model" to the leasing model? See #'s 2, 5, 6, 8, 12 and 16.

2) Making tax laws work for the industry's advantage

Most countries allow for depreciation charges to offset income. If product and service providers (think of a lift / elevator company like ThyssenKrupp) lease their goods, they continue to own these products, enabling them to depreciate them. Ultimately, this can increase profitability and lower cost. However, depreciation is just one of hundreds of issues regarding taxation. We need a modern business platform to continually analyze the changing landscape concerning taxation in each country that sources a product or service. See #'s 3, 6, 8 and 16.

3) Global sourcing and transfer pricing

A product sourced from Japan is up to 13% less expensive to purchase for an asset in the United States if it is bought by an entity in Mexico and subsequently sold into the U.S. Trade deals and tariffs are continually changing. Where to domicile revenues and expenses? Sophisticated algorithms are needed to optimize the sourcing of goods and services from around the world. Britain may soon change many of its trade rules with the EU and other countries. How does our industry take advantage within a continually-changing landscape? See #'s 4, 8, 12, 14 and 16.

4) New accounting methods

Percentage of completion accounting has been the standard for capital projects for decades. The problem is that it this leads to extensive variations in revenue recognition which impacts the balance sheet and the ability to control cash flow. Most contractors that go bankrupt do so because of problems in managing cash. What is a more appropriate way to manage and account for the income and expenses of a facility? How could these new methods interface with modern approaches to managing asset development and operation? See #'s 5, 6, 8, 11, 12, 14, and 16.

5) Flexible approach to capital markets and investment

A recent $4.3 Billion megaproject in Mexico took over three years to syndicate a loan amongst 14 banks. The world's financial systems are designed to spread risk by making a large number of small loans, not a small number or large loans. While this builds on #1, the question is how do we do more commercial financing at preferable rates when compared with investment banking(?). Moreover, how does the industry take advantage of the increasing prevalence of non-traditional investors such as private equity firms, pension funds, Master Limited Partnerships (MLP), micro-lending, and other new investment vehicles. Finally, how should we align the market analysis and production projections for a new asset with its development and operation? The answer could be to build more facilities, each with less capacity and continually re-analyze those decisions in real-time. See #'s 9, 11, 15 and 16.

6) Equity participation in asset creation

Traditionally, large owners (corporations or governments) held 100% ownership of the assets which they developed and operate. Along with a leasing model (amongst others), we need to enable investors or all types to examine the role of awarding equity in assets to the people and companies who plan, design, construct, and operate them. A key problem with the industry's

service providers is that they own very few assets and this limits their ability to obtain financing – a vicious circle. Under what circumstances would equity in an asset be distributed amongst all those involved? See #'s 8, 12, 14, and 16.

7) Large risk insurance / reinsurance / surety and bonding

Transactional costs are the root cause of escalating costs in developing and operating an asset. Chief amongst these are the duplicative insurance coverages designed to insulate stakeholders and stockholders in an asset from each other. To combat these trends, we must formally engineer trust back into the industry's business model. This doesn't have to be done financially, but rather, could be done through a blanket agreement to mutually support people and companies on various facility programs. Entire cost centers are unnecessary. Which ones? See #'s 12, 14, and 16.

8) New credit facilities

What new forms of simulation and actuarial approaches are available to support credit being extended to product and service providers for the creation and operation of an asset? Could this be done in mutual way? What about originating this credit from various tax havens? How would the creators of a new asset be able to optimize the use of credit in lowering the total cost of ownership (TCO) of the asset itself? See #1, 2, 4 and 16.

9) Agile approach to design / digital twin / generative design and process simplification

Today, many large projects spend 12 to 18 months planning ahead of a final investment decision (FID) to proceed with the detailed design and engineering of a single project concept. The problem is that this process is taking too long to produce sub-optimal designs. Agile project management can be used to simultaneously plan and design since this activity can take place entirely in a virtual environment. We also possess the design tools and computing power to continually generate more efficient designs and configurations. We can even do production planning with millions of different approaches analyzed in minutes. These technologies are making mass customization and situationally-adaptable standardization a reality. They are also enabling the reuse of designs and maximizing supplier-led design contributions. How do we take advantage? See #'s 10, 11, 12, and 16.

10) Workforce of the future

Our industry talks a lot about "Workforce Development," lamenting that we don't have enough people getting into it at any level. That's unfortunate, because our industry is what improves the human condition. The perception of "difficult, dirty and dangerous (the 3D's)," is out there. The question is, what will attract people to what we do? How do we create a culture that values the innovation, creativity, and inventiveness of knowledge workers, craft professionals, and manufacturing employees? Increasingly, there is a belief that we can do a lot more of our work in a manufacturing or fabrication shop environment, requiring up to 80 or 85% fewer workers on site. That may be in line with current trends (we can find people for manufacturing jobs but not construction jobs). How do we go about creating the workforce of the future? How do we attract, compensate, and retain? How do we connect people to the work we're doing? See #'s 11, 12, 15 and 16.

11) Modern production methods including miniaturization

Building big is cool – but exponentially more expensive than building small. For a long time, people believed that there was economy in building big. Computer-aided manufacturing changed this notion because the economies of scale and repetition prevail. Combined with an approach toward multiple similar units, the shutdown / turnaround / outage / repair model may not be necessary. Embracing the latest manufacturing techniques and modern management systems (the ones we have are from the 1950's and '60's) can yield big gains. Where to start? How to evaluate? Can we leverage manufacturers and the wider supply chain in this discussion? See #'s 10, 13, and 16.

12) Optimal and real-time partner selection

A $400 Million dollar project has about 400 organizations that have been contracted to supply goods and services. Project failure is often the result of suboptimal partner selection. What is the

best way to select the people and firms doing the design and supplying the products and know-how? Part of this depends on creating the right objective function – that is, probably not optimizing first cost. Rather, maybe a focus on maximizing the return on investment (ROI) or a similar metric is needed. What is the contribution of the jobsite office trailer to ROI? What about the engineering (probably more)? Here, we can really use developments such as cognitive computing for our advantage. Availability, track record, product or service efficiency; all of these can be evaluated against an objective function by modern computational methods. Really, what is the optimal arrangement of partners to supply the goods and services when needed in order to optimize ROI or TCO? What are the foundational elements of analyses of this type? See #'s 13, 14, and 16.

13) Supply chain rationalization

The physical nature of the architecture / engineering / construction (A/E/C) industry (from a historical perspective) created the need for lots of distributors / product representatives / logistics needs. But the modern economy has enabled global sourcing factory-direct. In any shift in business approach, there are winners and losers, the formation of new firms, and the reconfiguration of others. We can rationalize the supply chain against an objective function to determine who is adding a lot of value and who is not. What is the impact? What technologies enable this to happen (i.e., logistics software and blockchain, amongst others). What parts of the supply chain could be done much more efficiently? See #'s 12 and 16.

14) Contract simplification

Elimination of organizational layers, i.e., the "food chain" will result in far fewer contracts being necessary to transact business. In fact, it may be possible through a common platform to have one contract for investors (capital markets) and one for product and service providers. Other industries have done this to great effect, eliminating RFP's, purchase orders (PO's) and a lot of transactional waste in terms of time and cost. How much time and cost is associated with complying with contractual provisions? How might we have a more streamlined legal environment? How much ROI did the contract create or destroy on your most recent project? See # 16.

15) Asset crowdsourcing

Who creates the need for a new asset? Traditionally, the answer to this question has been the traditional owner / operator. But these firms historically did three things: 1) identify a need for a product / service / facility, 2) fund the capital requirements through earnings or debt, and 3) operate the facility. The issue is that these three things can be disaggregated. Various companies or people can do any of the three without having a traditional owner. For owners, this frees them to determine which parts of this equation would they like to keep. For the rest of the world, people and organizations can use social media and other means to rally behind assets that they want or need to have rehabilitated. Where there's a will there's a way. Is crowdsourcing your next asset a possibility? See #16.

16) Cloud-enabled, thin platform

Dramatic increases in information awareness and flow are possible when information isn't held and controlled by the "project team" as the integrator of all stakeholders contributing to the project. Freeing up the data allows the pace of information flow to increase by ten or a hundred times, vastly speeding up the project. Additionally, there is an intense need for our industry to hold and value data and the knowledge that can be mined. The greatest advances in technology in the last 5 to 10 years has been in the digitization of industries on cloud platforms. Our industry may have some product platforms, but we're definitely missing the business platform that is foundational to the business of our industry. How do we go about doing this? How do we leverage the platforms that are out there already and in development? Interestingly, all other important considerations on this list point toward a cloud-enabled, thin platform as a necessary component of a new business model for our industry.