UNIVERSITY OF CAMBRIDGE

Transforming construction: impact case study

Benefits to industry: enabling collaboration to identify common project goals and deliver improved productivity and cost reduction

Collaboration and interdependency: exploring the relationship between designers and contractors

Collaboration in construction

Cost overruns, late deliveries and legal disputes are common complaints of the construction industry that affect efficiency, productivity and financial returns and impact on wider economic growth and prosperity.

Collaboration is regularly proposed as a mechanism to achieve improved working relationships, information exchange, quality, timing and to reduce conflicts, risks, and costs. Changes and improvements to the sector are required in order to achieve the targets set in Construction 2025 – the joint strategy from government and industry to transform construction – including reduced costs, faster delivery, lower emissions and improvements in exports.

The potential benefits of collaboration in the construction industry is a focus for the Construction Leadership Council (CLC): Andrew Wolstenholme, Co-Chair of the CLC, said: "We need to work collaboratively on all fronts – procurement, skills and innovation to deliver the outcomes that our clients and their end users require and deserve". (http://www.constructionleadershipcouncil.co.uk/news/our-opportunity-the-construction-industry-sector-deal/)

Design and build

In order to move to a more collaborative model, the UK construction industry must change its traditional way of working.

Design and Build (D&B) is one of the three procurement routes favoured by the government for publicly-funded projects; two major UK infrastructure projects, HS2 and Thames Tideway Tunnel, are currently procured through the D&B method. The method is also increasingly popular in the private sector. The D&B procurement route is reported to bring up to 20 per cent reduction in time, due to the overlap of design and construction, and up to 20 per cent of reduction in costs, due to simplified design solutions.

This case study considers the enablers for collaboration between designers and contractors in D&B infrastructure projects in the UK. It will evaluate the relationship between main contractors and designers to understand the perception of what collaboration involves, determine which factors and behaviours affect collaboration and look at the interdependency of activities.

While D&B procurement is considered a step towards a more collaborative environment, in most cases, the main parties in D&B seek to avoid or exploit risks to maximise their own financial profits, rather than find ways to share risks and collaborate genuinely to benefit all parties. Collaboration is highlighted as a key problem in the construction industry by a number of recent reports (Cable et al., 2013 & Cabinet Office, 2011 & HM Treasury, 2013 & HM Treasury, 2014 & Farmer, 2016).

The approach

A qualitative method was used in this case study and data was collected from semi-structured interviews with influential industry executives, coupled with the author's auto-ethnographic diary to better understand the behaviours and actions of participants. Quota sampling was used and people from the construction industry, including representatives from three main categories, designers, contractors and clients, were selected. The target number of interviews was set at 22 to include: 12 contractors, 6 designers and 4 clients. The individuals selected had executive power within their organisations, extensive experience in the industry and had worked on several D&B projects. The interview questions focussed on the topics that emerged from the theoretical framework:

- Collaboration definition
- Designer/contractor selection
- People selection
- Leadership
- Effect of incorrect resources
- Common goals
- Motivation
- Trust
- Interdependency
- Change
- Conflict and disputes

While D&B procurement is considered a step towards a more collaborative environment, in most cases, the main parties in D&B seek to avoid or exploit risks to maximise their own financial profits, rather than find ways to share risks and collaborate genuinely to benefit all parties.

Analysis of findings

The lack of collaboration on D&B projects can be linked to the absence of a clear unanimous view of what collaboration means, what it involves and which behaviours it drives.

People and leadership were identified by the interviewees as fundamental for successful collaboration. Leadership dictates collaboration. Issues can be resolved quickly when the leadership of the respective parties works well together and has reliable personal relationships, and a high level of trust and openness. Sharing common goals was identified as part of the definition of collaboration.

Motivation was discussed in relation to the contract in order to make collaboration compulsory. Leadership was cited as the source of motivation and reward was the most common topic but presented in a number of forms: regular rewards to designer to provide motivation throughout the term of the project; reward for the team and not individuals; and reward of behaviours rather than outcomes because bad behaviour can achieve right outcome.

Trusting project partners from the start invited a range of responses. Some participants agreed entirely, others agreed as a necessity of the partnership while the majority believed trust must be earned. All agreed both parties must invest in trust. A practical suggestion was to hold a workshop at the start of a project to help build relationships and trust.

Interdependency is acknowledged as important but clients, contractors and designers can have a different view of what the term means. Clients are concerned that contractors and designers, working on large projects, do not spot all the interdependencies and work in isolation. Some contractors think designers do not understand construction or timescales. Workshops to discuss design preferences and construction issues could support more effective communication.

Collaboration brings benefits but needs support

Results indicate that collaboration is rare in the relationship between designers and contractors. In order to enable collaboration, D&B participants need to focus on: unanimous definition of the term, leadership, common goals, motivation, trust and interdependency of activities. The findings of this case study conclude that collaboration issues between designers and contractors reside in the relationship and behavioural aspects of a project rather than the on technical aspects.

This research finds close links between the key factors enabling collaboration in the context of the relationship between designers and contractors: common goals; people; leadership; motivation; and trust.

Previous research has made connections between two or three of these factors, but this case study identifies significant links between all.

Where common goals, people, leadership, motivation and trust exist, real collaboration can happen.

Next step

While collaboration is beneficial and welcomed by the industry, action is required to secure the elements that support it, including behaviours around trust, mutual understanding of each other's drivers, needs and interdependency of activities. Governing contractual mechanisms should also be better defined.

Contractors and designers would benefit from workshop activity at the start of a project to enable a more collaborative environment by identifying and agreeing on: expected drivers, behaviours of the project team, types of motivation, common goals, and focus of the leadership.

This research finds close links between the key factors enabling collaboration in the context of the relationship between designers and contractors: common goals; people; leadership; motivation; and trust.

Securing effective collaboration on D&B projects requires the construction industry to actively invest in 'soft skills' as well as technical skills when developing people. This focus could also inform the education of engineers in order to develop behaviours that support collaboration alongside specific technical skills.

LAING O'ROURKE CENTRE
for CONSTRUCTION ENGINEERING
and TECHNOLOGY

The Laing O'Rourke Centre for Construction Engineering and Technology, in the University of Cambridge Department of Engineering, was launched in 2011 with industry partner Laing O'Rourke to fulfil a shared vision of transforming the construction industry through innovation, education and technology. The Construction Engineering Masters (CEM) degree programme is designed to shape the next generation of industry leaders and undertake innovative research projects that deliver value to industry.

Case study

This case study is based upon a Laing O'Rourke Centre for Construction Engineering and Technology Construction Engineering Masters dissertation titled: *Collaboration and interdependency: Exploring the relationship between designers and contractors* (2018). The research is by Alessandra Villa, Associate, Arup.

Further details

For more details about this case study contact:
Centre Manager
Laing O'Rourke Centre for Construction Engineering and Technology
Department of Engineering
University of Cambridge
Tel: +44(0)1223 332812
Email: centre.manager@construction.cam.ac.uk
Website: www.construction.cam.ac.uk