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POSITIONING QUANTITY SURVEYORS IN A COLLABORATIVE PRODUCTION SYSTEM

Sa'id A. Namadi¹, Christine Pasquire², and Emmanuel Manu³

Centre for Lean Projects, School of Architecture, Design and Built Environment, Nottingham Trent University, UK.

said.ahmed@ntu.ac.uk, christine.pasquire@ntu.ac.uk, emmanuel.manu@ntu.ac.uk

ABSTRACT

The lack of trust and collaboration between Quantity Surveyors (QSs) with other project stakeholders, is impeding their ability to create value and minimize wastes in construction processes. Precisely, the adversity that exists between the client & contractor's quantity surveyors (PQS/CQS) and the rest of the key stakeholders has allowed 'self-interest' to thrive to an extent that it hinders the practicality of achieving true collaboration in practice. Traditionally, QSs within the UK system are popularly known for their commercial management functions i.e., contract advice and cost related roles. But, prevailing customer practice has brought about a 'duality' in the construction model where now QSs functions are separated from that of the project production team (client, designers, constructors). Accordingly, a recent industry report (*Modernize or Die*), cautioned that the UK industry need to transform to a much higher-level model i.e., manufactured led construction – delivering in a more integrated system (ideally through collaboration). Furthermore, the report also calls on the QS professionals to revalidate their core competencies for the industry to modernize. This shows that many of the QSs functions acting on either side, that amount to multiple transactional interfaces needs to disappear. Through a literature review and in-depth interviews, the study contributes by examining QSs position in a collaborative production setting, revealing how they might collaborate with other stakeholders in construction. In addition, it also revealed an example of practice that shows how QSs can challenge and improve their current position going into collaborative practice.

Keywords: construction industry, project delivery model, quantity surveyors, collaborative practice, target value design.

INTRODUCTION

The UK construction industry over a long period has attracted many criticism over its relationships, poor collaborative culture, structural fragmentation, and lack of stakeholder's involvement cited as significant amongst the shortcomings (Latham, 1994; Egan, 1998; Eriksson, 2002; Chan et al., 2003). The recent farmer report (*Collaborate or Die*, 2016) has also, sparked a timely debate on many of these shortcomings. The report called the attention of construction professionals including the QSs, citing the lack of collaboration in practice, which has proven to be a major challenge for the industry that dominates the process of design, planning and execution (Daniel et al, 2015). In fact, it has worsened in the QSs cost management functions where costing and design are carried-out discretely – and the client's advisors (PQSs) work in isolation from other stakeholders (Zimina et al, 2012). However, for several years now, the aspirations and efforts within the UK construction

industry has been on how project stakeholders can collaborate to achieve project success (Sunil et al, 2014).

However, most of these efforts still focused primarily on the conventional project management system, which is still based on ‘project-control’ that has brought a disconnection among stakeholders in design and production processes (Saunders, 2013). It can be argued that the lack of true collaboration among participants, especially in the early costing & design process has led to a ‘fire-fighting’ (safeguarding) practices that only result into more cost overruns and value loss. Equally, the prevailing construction model, which has been the main route to procure and construct facilities in the UK (RICS, 2007) has been challenged in literatures (Pasquire et al, 2015, Sarhan et al, 2016). The model is mostly preferred by one-off clients, who rarely collaborate in construction and somewhat ‘dualized’. This division as revealed in (figure 1) below, shows how the project parties are structurally assembled, with a contractual arrangement that binds their commercial interests (Thomsen et al, 2010). The second variant of the model revealed also a separate stream that is mainly concerned with overcoming transactional governance issues that uses risk as a criterion to influence construction procurement (Pasquire et al, 2015). Sadly, this is now a role mostly associated with the Qs with lack of trust and collaboration (Osipova & Eriksson, 2011). The current position of the Qs in the model is inherent from the construction industry where commercial considerations and opportunism have prevailed over collaborative working (Pasquire et al, 2015). Indeed, one aspect of this that require consideration is the ability of those managing and administering projects (Qs, PM’s) to collaborate and create a positive link within a value chain instead of being a burden to it (Farmer, 2016). Hence, to enhance the role of Qs and encourage collaboration between them and other project stakeholders, the study explores the concept of collaboration in a production setting (lean system), where regrettably their role is presumed non-existent.

METHODOLOGY

The study adopted a semi-structured interview guide, where complexities in the current delivery model; concept of collaborative working involving the Qs in construction were explored. A generic purposive sampling approach (Bryman, 2012) was adopted for the study. It’s a non-random technique that does not require a set number of participants (Etikan et al, 2016). In this approach, the researcher pursues on some critical questions related to the study, choosing suitable respondents capable of providing information based on their knowledge and expertise. Based on this, the study interview nine industry experts with 20+ years of relevant practical experience. The interviews were conducted with experts as follows (3 consultants, 2 clients, 2 main contractors, 1 sub-contractors and 1lean practitioner). The backgrounds and characteristics of these respondents is illustrated in table1 below. The process of ‘theming coding’ was used, to captures the salient phrases from the interview transcripts and symbolically assigns summative attributes to the portion of the data called codes. 15 codes emerge from the process, and were categorized to generate themes that further describes the studied phenomenon tacitly and deduce meanings from it.

Table. 1 Participant's Characteristics

| Participant ID | Job Title | Experience | Background |
|----------------|------------------------|------------|-----------------------|
| A1 | Cost Consultant | 33 years | Construction/Civil |
| A2 | Associate Director/QS | 20 years | Construction |
| A3 | Lean Consultant | 20 years | Manufacturing |
| A4 | Senior QS Construction | 15 years | Construction |
| A5 | Director/Consultant | 25 years | Civil |
| A6 | Senior QS Contracting | 18 years | Building |
| A7 | Senior QS Consultant | 20 years | Construction |
| A8 | Main Contractor | 25 years | Construction |
| A9 | Principal Lecturer | 20 years | Building/Construction |

LITERATURE REVIEW

Performance Improvement and Inefficiencies in the Construction System

The significance of integrating project stakeholders and improving process performances has been established in several literatures (McDermott, 2004; Cain, 2004; Fischer et al, 2017). It is not a surprise though that collaborating to share knowledge, expertise and information among project participants has progressively yielded much success (McDermott, 2004). Among several other benefits achieved from this integration are: increased value and predictability of works; improving customers project requirements; decreased in the number of adversaries in contractual disputes; and establishing environment where collaboration and innovation prevails (Bresnen & Marshall, 2000; Constructing Excellence, 2004). The chances of achieving these feats in projects through collaborative working is high. Unfortunately, this does not seem hands-on in the UK construction industry. The delivery model is yet to embrace fully the principles of collaborative ideals as instances of poor project performances are not abating (Akintan & Morledge, 2013).

Separation within the construction delivery model has revealed several issues which has been highlighted in other studies as opportunistic practices (Pasquire et al, 2015), the use of ambiguous amended contracts (Greenwood, 2001), late payment culture (Hughes et al, 2000) among others. Equally, this has brought a discrete role associated with the Qs that is unacknowledged within the model. An illustration can be seen in the figure below where the Qs are structurally detached from that of the project production team (client, designers, contractors). Evidently, this is now a commonplace in the UK, a model that continue to allow clients and stakeholders to deploy 'risk averse' method to safeguard their assets against opportunism even at the detriment of the project (Pasquire et al, 2015).

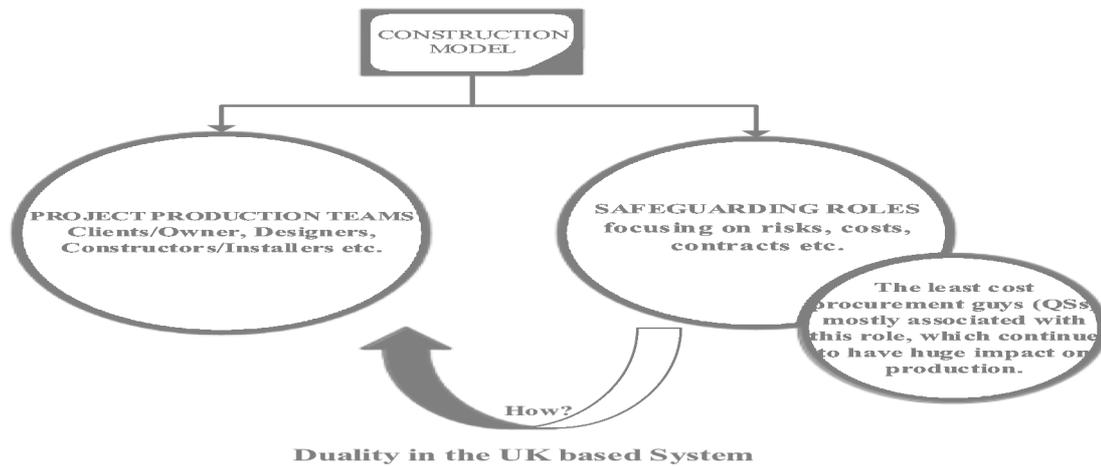


Fig. 1 The UK Construction Project Delivery Model.

More so, here the QSs are used traditionally lacking proper integration and collaboration upfront (conceptual stages) to be able to challenge their traditional roles – which leaves them with options of optimizing their parent companies at the detriment of the project that arguably leads to more cost overruns. Seemingly, clients don't seem to understand the implication of excluding the QSs upfront (from most of the decisions at conceptual and design stages) is prompting into value-loss in projects (Doloi, 2011).

Concepts of Collaboration/Collaborative Working and the QSs Perceptive

Collaboration or to collaborate is a term that has been widely accepted to improve productivity and performances in business areas such as information technology, organizational development and service delivery. Schrage, (1990 pp20) observed it as a practice of shared creation between two or more individuals with complementary skills interacting to create shared understanding that none had previously shared or could have come to on their own. Similarly, Fischer et al (2017) maintained that collaboration could be viewed as a community of people working together to achieve a common goal - through a deep level trust, clear understanding of project values and feeling a sense of community. Though, in construction, it's often used as synonymous to partnering working referencing to a wider philosophy of trust, fairness and equity (Challender et al, 2014). This implies that the underlying principles of collaboration is interaction among participants within a community, not only attempting to achieve work together, but also supporting the success of others.

Collaborative working (CW) is a term used in construction industry to denote collaboration. CW is mainly concerned with a mutual and beneficial working relationship among stakeholders in construction project, to effectively deliver the project to the required standard (Mattessich et al, 2001; Xue et al., 2010). The concept is still gaining prominence in construction, which is set to underpin relationships between project actors, so that they are based more on openness, trust and cooperation, rather than on sharp contractual formulations (Dagenais, 2007). It has also been argued to bring several benefits in projects, especially when it's based on early stakeholder's involvement (Alderman and Ivory, 2007). These definitions and meaning of collaboration and CW is also consistent with the perceptions among the QSs interviewed in this study.

For instance, when asked about CW from a PQS working for a consulting group in UK, April, (2017), the respondent connote saying: *'Collaborative working is about creating effective working relationships between people and companies so that you can achieve a strategic aligned interest that is based on trust.'* Similarly, another respondent with a contracting background addressed the same question saying: *'Collaboration is working together to deliver a project, with the need to trust each other and work towards a common goal and accept each other's goals as well. It is equally important to have an understanding on profit margin, quality delivery, respect for each other's purposes in this way of working'*. This is suggesting that the actual conceptual meaning of collaboration does not differ from what the QSs perceived it to be in practice. It also revealed from their interpretations, some key components of CW- such as trust/transparency; clear goals; values and interactions/sense of a community. In fact, it shows a strong sense of believe among some of the QSs interviewed, on CW and how effective it can be on their roles and functions. But the challenge opposing this in the construction industry with regards to CW, is implementation (Udom, 2013) as it seems to exist in principle rather than in practice.

More so, when the QS's were asked in this study's interviews about CW application in their work settings, their observations were: *'That's where I think we failed to progress, we get our work information basically drawings and the scope next to that and then we simply price it..., but there seems to be no room for working together.'* (A contractor's QS working for a leading infrastructure group in the UK, January, 2017). Another similar response from a different organization observed saying: *'one of the things that divorces QSs with other participants in the current practice, is that they're not set-up to collaborate and support the wider contract to manage it into their processes.'* (A client QS working for a consulting group in UK, April, 2017). Another comparable in-depth response from a contracting experience lamented that: *'If it's a client design we're not involved early on. We do the buildability but there is a lot of costs expansions particularly associated with the design because of the disconnection in our functions. But I think a more collaborative approach could suite the QS in this current system if there are no interference. Clients are always worried with the iterations in design and thus press the button on the contractors to finish work on time while the actual problem was not involving us at the developmental stages.'* (CQS with main contractor with a leading highway infrastructure group in the UK, March, 2017).

Overview of Traditional Cost Management Practice

The current cost management practice in construction industry has been criticized. Johnson & Kaplan (1987) observed that cost management information tends to be too late, aggregated and distorted to be relevant for production planning and control. It has been observed that professionals in charge-of this process (QSs/estimators, designers) proceeds even when inaccuracy in estimating is detected at the outset, where most of the cost data used are taken from previous projects that inherit waste (Ballard, 2008). In addition, other issues that has engulfed cost management practice were identified by previous research. These includes disruptions in the process, lack of collaboration, isolated decision making, and the lack of automated processes and limited understanding on cost management techniques (Ashworth, 2010; Hastak, 1998; Kern & Formoso, 2004; Dallas, 2006; Hanid et al., 2011). Conversely, the low level of

collaboration among stakeholders indicate the lack of interest in even developing communication and information sharing in construction (Cartlidge, 2006). Thus, necessitating the need for an integrated approach in costing practice that could be linked with collaborative practice (Namadi et al, 2017). Notably, the concept of target-value-design (TVD) has been used in other industries which has been proposed to the UK construction industry. But, research has indicated no evidence of its practical application in the UK system.

Collaborative Costing Approach in Production Setting: Target Value Design (TVD)

As a collaborative approach, TVD was adopted from target costing which originates from the manufacturing industry in the 1930's (Feil et al, 2004). The process was used by manufacturers and customers to manage product profitability (Cooper & Slagmulder, 1997). As a management strategy, it is flourishing under a collaborative environment where clients and project participants are all involved in conceptual deliberation to generate the values required (time, cost, features) for a project scheme. Furthermore, the process is efficient in eliminating wastes in design and construction process, which is set out to achieve optimum value in project delivery. Vrijhoef and Koskela (1999) suggest that making waste and problems visible early and identifying their root cause helps to resolve problems that may develop later. This process of bringing potential issues forward for team resolution and developing an alternative strategy that involve all key players upfront is achieved through TVD. Accordingly, Macomber et al (2007) reported that five certain principles allow TVD to flourish in a collaborative environment. These principles are: *target cost setting; collaboration; colocation; set based design; choosing by advantage and work structuring.*

Adopting these into the current system would mean that, the QSs and other relevant stakeholders during early costing and design development need to: (a) shift the entire emphasis from estimating based on detailed design to the idea of detailed estimate from outset; (b) shift to working together to define the issues and produce decisions then design to those decisions, against designing and then converging later for a group reviews and decisions; (c) revert to working in pairs or large groups and face to face against working in silos and separate rooms as prevailed traditionally; (d) allows several alternative solutions set far into the design process, where choosing by advantages is emphasized, enabling the selection of different alternatives when multiple factors and criteria are being considered, instead of narrow choices to proceed with design; (e) allow for designing what is constructible, instead of evaluating the constructability of a design. These succinct working arrangements clearly would create a common understanding, team integration that would enable a clear path to waste elimination in the processes of costing and design (Rubrich, 2012) hence, improve and bring innovation into the role of QS's and their relationships with other stakeholders through collaboration. Likewise, certain benefits and opportunities can be drawn from the approach to have an impact on the UK costing model. But, as revealed by the study of (Namadi et al, 2017), the commercial practice in the UK system has a steep mountain of challenge on teams that even wanted to collaborate at these stages. However, similar models such as cost-led procurement, integrated project insurance and two stage open book accounting would be a good starting point if patronized effectively.

Glimpses/Barriers/Opportunities on QSs and Collaborative Practice

The purpose of this study is to further elucidates some aspects where QSs tends to collaborate with project team in practice. Table 2. below is an interview transcript conducted with QSs from a traditional and multidisciplinary practices. It revealed some of the glimpses, drivers, barriers and opportunities associated with the QSs and the current collaborative working perspective. The result has shown that customer practice continues to affect the efficacy of the QS professionals and other construction stakeholders going into collaborative practice. As clearly illustrated from the table, one of the respondent a CQS with 15 years' working experience within a traditional firm asserted his views on collaborative working, lamenting that the QSs can aid in facilitating collaborative working even down to the supply chain. Practically, it shows how collaborative working can thrive from the QS's perspective when there is clear understanding of purpose and if goals are aligned. However, he further bemoaned that the biggest factors opposing this to happened are 'trust and transparency' which is strongly overshadowed with customer practice nowadays. But, he's optimism on collaborative working underlined that QS's are relevant i.e., at conceptual stage where their expertise is required and their relationship with other stakeholders has proved to be lucid.

Other responses from a multidisciplinary practice, complement the views from the traditional practice. The interviewees have several experiences working in a joint venture arrangement. They also concurred on how QSs are embedded in their system and shared the impetus of what drives them in the system. Their views on what is opposing them however, are lack of proper incentives that breeds the negative behaviors. Although, they recognized, which is consistent with the previous interviewee stating that QSs are crucial in the early project definition stages – where their input is vital in establishing project targeted cost.

Hence, these interpretations illustrate how significant QSs are when they collaborate within their functions and interact well with other project actors, but how they're structured commercially in the UK construction industry remains a key factor, as they're still placed in either agreeing or protecting a commercial position for their employers and clients (Farmer, 2016).

Table 2. Interview transcripts with respondent's views on QSs and collaborative practice

| Respondents | Aspects/drivers where QSs collaborate in practice | Barriers opposing the QSs | Opportunities CW offering to the QSs |
|---|--|--|---|
| <i>A4: when asked on where QSs collaborate in a traditional setup?</i> | <i>'So, we've build lots of houses using competitive tender, it was well planned, finish on time which proves we could work together. So, having done that through competitive tender, we did other 5 projects without any competitive tendering, we negotiated and decided to look at potentials, future alterations and we commenced. It was very fluid which work for about 5 or 6 projects. But when the client agent came, the whole thing reverts to competitive tendering saying we can't prove value for money. And to be fair we've made more money on that system than we ever did, because we knew our suppliers well. We've been doing that with our suppliers but very informal, we just came with what's best for the project and for us.'</i> | <i>Even if you propose a different approach, clients don't buy it because the focus is usually on price and competitive tender. So, it's like proposing to work on something different and the client ask for your trust on it and you're unsure because of the previous experience, where he says we will do this and he ended up doing something else despite what the contract says, So, it's totally down to trust and relationships that needs building. As we usually approach them with our eyes open to protect our reputation.'</i> | <i>'Well, am not a technical person but I can offer engineering perspectives in the conceptual stage, and it could be when the designers are looking at range of options relating to commercial involvement, QSs can offer cost advise/ value engineering proposition & more on risk management. So, if they're involved at that stage, they could offer that expertise and that might lead to some save benefits to the client and the project, & improving collaborative working also.'</i> |
| <i>A1: how do you get your QSs to collaborate in a multidisciplinary practice? And what are the drivers for them?</i> | <i>So, we have commercial managers/ QSs in every function, but generally we tried to get them to work so that we've only got one person doing the job, but also involved in a validation process (which is a conversation, run-through based on strategic alignment and trust) some of that will come out of micro audit through benchmarking. And the drivers of all this is our ability to exhibit behaviors like – respecting each other, ethical conduct, working to a common goal, & understanding each other's ambitions and aligning outcomes.'</i> | <i>We need the QSs expertise. But when we bring them in, we don't pay them a fee, so they usually earn their fee from the savings that they generate, and they must be real savings. I think it's the way to incentivise them to bring the right behaviour and to avoid bringing in tension into the team that is the challenge.'</i> | <i>'The role of QSs in a target cost (TC) arrangement is significant, it enables them to understand the premise of it, the assumptions made in the frozen design, improving the delivery time, productivity and collaboration... I mean almost the only person that should understand everything about TC is the QSs, so they're instrumental in enabling everyone else to understand how they can improve upon the TC'</i> |

CONCLUSION AND RECOMMENDATIONS

The study has examined QSs position within the prevailing system, exploring in practice how they can collaborate with other project stakeholders. It has also investigated how they can achieve collaborative working in other aspects of their roles within a collaborative production system. Most of the relational challenges in practice that is impeding their efforts towards CW has been identified. Similarly, results gathered from the literatures and interviews, has also explained on the UK construction delivery model, barriers, challenges and implications on the QSs over CW in construction. This however, has fall largely due to the mistrust among various professionals. Amongst other things discovered, were the barriers that still exist within the prevailing system which has impelled the adversaries in construction. The work of

Pasquire et al (2015) referred this to a model that is focused in managing contracts rather than managing production. The findings further revealed how the current situation affected the QSs and their relationships with other stakeholders, which allow the issue of vested interest and power ratio to thrive among project participants and from the QS's perspective, a fear that collaboration would mean to collude with other parties. Majority of the research respondents are skeptical though about this paradigm shift. This is linked with the strong persistent and usage of standard form of contract which is contributing immensely to most of the problems identified above, and part of the reason why professionals such as the QSs/PM's are mostly concerned with protecting a commercial position for employers and clients.

Despite these obstacles, particularly regarding the absence of the QSs in a production setting, this research has discovered that these challenges are not unbeatable and there is yet a possibility for QSs to interact and particularly collaborate with the production team and overcome their relational challenges going into a new integrated model. Merging QSs capabilities as identified in a collaborative production setting, through the concept of TVD has proven that collaboration is achievable and the QSs position in a production system is even feasible. Some of the lessons learned from this approach are; TVD persists on early stakeholder's integration in design stages. According to Lichtig (2010), TVD has proven to be an ideal approach in this sense, as it provides the platform for team engagement even before 25% of the design is complete. It also changes the current focus in costing that is set to be on finishing design and then making the budget. The work of Namadi et al (2017) further revealed how TVD approach found its basis from collaboration and how it correlates with the QSs to promote collaboration between them and other stakeholders in construction. This offers hope to the UK model particularly from the QSs perspectives, as the adoption of TVD concept can address some of the issues relating to design-estimate-redesign and lack of collaboration in costing activities which means it will not only breakdown adversarial tendencies known within the prevailing system, but will ensure commitments on projects, thereby allowing collaborative behaviors.

Another point worth mentioning is that the presence of QSs as crucial participants in a production system, and establishing the right people very early on in a bit to improve consistency & accuracy during project cost development (an investment upfront) might create a platform and the beginning of proper collaboration. Conversely, the study has discovered that leaving the right stakeholder's outside the core team (project production team) is counter-productive. QSs role in this sense is significant to clients providing commercial roles, optimizing their onerous functions and offering different perceptions on risks, cost and procurement approach. Although this needs a practical verification from the industry, as currently, there is no contractual arrangement that allows all participants' early integration including the QSs within a core team because of the UK commercial structure which is the challenge and a suggestion for future research.

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