APPLICATION OF SIGNALLING THEORY IN CONTRACTOR SELECTION FOR LONG-TERM COLLABORATIVE RELATIONSHIPS IN CONSTRUCTION

Calistus Ayegba[1] **and David Root**

School of Construction Economics and Management, University of Witwatersrand, Witwatersrand, Braamfontein, Johannesburg, 2000, South Africa

Contractor selection for long-term collaborative relationships will involve carrying out a behavioural assessment of potential contractors to establish their competencies for collaboration and long-term relationships. People behavioural characteristics such as their trustworthiness, emotional states, genuineness, innate abilities and their possibility of acting in an expected way in the future are often challenging to evaluate in a physical encounter directly. In this study, the exact observable signals that indicate a contractor's suitability for long-term collaborative relationships were empirically investigated from the client's organisations point of view, employing signalling theory. Data was collected using semi-structured interviews with eight purposively selected organizations involving sixteen key informants in South Africa. The significant signals which are perceivable indicators of contractor's suitability for collaboration and long-term relationships from the findings are: Past-performance signals; commitment signals which not only concerns attendance but also contractor's willingness, participative contributions and top management involvement in the various activities during the selection processes; and behaviour signal which comprises of being polite, honest, respectful and realistic. The study result represents a significant contribution to knowledge and understanding that are useful in identifying required signals to be sought in contractors for realistic evaluation, and ultimately make a better decision in selecting an appropriate contractor for long-term collaborative relationships. This study thus makes a strong case in providing theoretical explanations of contractor selection practices to accommodate for long-term collaborative relationships from a signalling theory perspective.

Keywords: collaboration, contractor selection, long-term relationships, signalling

INTRODUCTION

The selection of a suitable contractor is critical to the success of any construction project (San Cristóbal, 2012; Doloi, 2009). Thus, several studies exist on contractor selection and the traditional evaluation methods. In contractor selection for long-term collaborative relationships, the behavioural assessment of potential contractors to establish their competencies for collaboration and long-term relationships is essential. However, it is difficult to discern or assess the behaviours of people or organisations. Notably, as it will have to do with considering intangible attributes such as honesty, openness, genuineness, commitment and people possibility of acting in an expected

[1] buildercally@yahoo.com

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way in the future. In contrast, contractor selection practices in the traditional contracts which most people are used to, only consist of evaluating written and oral submissions (Dewberry *et al.,* 2018) and considers more of hard attributes such as time, price, quality and resources.

This is not to say these hard attributes are not relevant when selecting contractors for long-term collaborative relationships but will be inadequate to cover all the issues upon which to select a suitable contractor for long-term collaborative relationships. In addition, for long-term collaborative relationships, assessing the behaviours of potential contractors is required (Dewberry *et al.,* 2018). However, owing to the difficulty to directly quantify and evaluate people or organisations behaviour for assessment in a physical encounter, one will need to apply signalling theory and rely on signals thought to correlate with the underlying attributes to be able to establish contractor's competencies for long-term collaborative relationships. Signalling theory helps to explain how one can make a decision relying upon signals, which are perceivable indicators of non-directly observable qualities. Therefore, the theory provides a lens to explore the signals that offer an opportunity for identifying required attributes for long-term collaborative relationships in a contractor selection process.

LITERATURE REVIEW

The Evolution of Long-Term Collaborative Relationships in Construction

Long-term collaborative relationship practices are increasingly being adopted globally, owing to its success in the manufacturing and service sectors, where the strategies are seen as a vehicle to maximise value, levels of quality, and service delivery (Khalfan *et al.,* 2014; Frödell, 2011; Baiden and Price 2011). In construction, the interest in long-term collaborative relationships is attributed to the industry's response to the failings of traditional contracting practices. Also, the influence of the Latham 1994 "constructing the team" and Egan 1998 "rethinking construction" UK construction industry reports together with other construction industry reports from Hong Kong, New Zealand, and Singapore are credited to have influenced the rising trend of collaboration and long-term relationship practices in the construction industry (Kamudyariwa *et al.,* 2018). The approach has been shown to be mutually beneficial to both clients and contractors when adopted for project delivery.

Long-term collaborative Relationship involves an arrangement that brings together the concept of collaboration and long-term relationships. Table 1 shows long-term collaborative practices. As evidenced in Table 1, long-term collaborative relationships requirements are indicated to focus on creating an enabling environment that optimises the ability of project team members to work together efficiently and collaboratively. Thus, building a long-term business relationship through which a series of projects can be delivered successfully without litigation. This is a fundamentally different situation from what is sought in the traditional contracting practice of one-tender-per-project approach, where the client enters into a contractual agreement and assembles a separate supply chain for each project, with short-term relationships, and a consequent concentration of knowledge within the design team only (Ruparathna and Hewage, 2015; Watermeyer, 2012). Such practices are said to often result in significant opportunities for claims and inappropriate risk avoidance, and, consequently, adversarial relationships and litigation processes (Watermeyer, 2012).

Table 1: Long-term Collaborative Relationship Requirements

Author(s) and year	Long-term Collaborative Relationship Requirements
Sanchez (2012)	- Having shared goals - Being involved in the process - Having open lines of communication - Directed engagement
Babaeian *et al.,* (2016)	- Trust - Commitment - Teamwork - Open communication - Common goals between partners - Fair balance of risks and rewards - Consistent objectives - Mutual trust - Clear contract - Clear decision-making mechanism - Clear understanding of responsibilities
Frödell (2011)	- Willingness and capability for collaboration - Aligned core values - Parties to be approachable, honest, and responsive - Total cost focus - Knowledge, along with delivery precision - Trust - Long-term orientation
Suprapto *et al.,* (2015)	- Commitment - Teamwork - Co-operation - Relational attitudes - Capability - Team integration - Connectedness of owner and contractor striving for a common goal

Signalling Theory

Signalling theory helps to explain how one can make a decision relying upon signals, which are perceivable indicators of these not directly observable qualities. The core idea of signalling theory has its root in the writings of Thorstein Veblen, "The Theory of the Leisure Class" in 1899. Thorstein Veblen used the principle of signalling theory to explain ‘wasteful' human practices, by suggesting that the conspicuous consumption and wasteful spending of the wealthy served as a signal of their status as elite.

In economics, based on the earlier work of Akerlof (1970) who argued that without signals of product quality, product markets would not exist as there will be little information to distinguish low quality from high-quality products. Spence (1973) indicates that signals are essential sources of information in the case of information asymmetry when information that is more objective is unavailable. In explaining the role of education as a signal in employer-employee relationships using signalling theory, Spence argues that since the cost of the opportunity, which is the sum of time, tuition and effort spent on education, is a good indicator of performance, the level of education is correlated with better work performance. Therefore, employers use the level of education as a signal that helps differentiate low-quality applicants from high-quality applicants for job selection. Thus, the use of signalling theory helps mitigate the potential for adverse selection.

Application of Signalling Theory and its Relevance to this Study

As illustrated from the preceding, signalling theory is a vital theory employed across a wide range of research context, and it is indicated to be genuinely interdisciplinary. Gambetta (2008) posits that the signalling theory is the fastest developing theory across all behavioural sciences in recent times. The theory is used to identify the range of potential signals and the contexts in which signalling occurs to provide explanation and solution to the influence of information asymmetry and uncertainties.

Its application covers varieties of subject areas and disciplines such as human courtship, commercial advertising, entrepreneurship other business contexts, religion, and animal communication. Others include Human resource management/job market context, sells of equities /online auction, economics, social networks, sports and sociology. Virtually in every relationship and endeavour, people rely on the application of signalling theory, especially when dealing with characteristics that are unobservable or difficult to perceive directly. Donath (2011: 1) well illustrates this in her write up:

> A bird wants to know if the butterfly it is about to eat is poisonous before it takes a bite, and relies on the signal of wing markings to decide whether to eat or move on. An employer wants to determine before making a hiring decision whether a candidate will be successful or not and relies on signals such as a resume, references, and the candidate's actions and appearance to predict suitability for the job. A smile can be a signal of happiness, a wedding ring a signal of being married, smooth skin a signal of youth, and a big house a signal of wealth. ……Indeed, much of our communication, whether it is with words, gestures, or displays of possessions, consists of signalling information about who we are and what we are thinking.

Bergh *et al.,* (2014) opines that the increasing adoption of signalling theory in management research is because the theory addresses the core problems of how strategic decision maker can use signals to reduce the uncertainty associated with making a selection among a choice set and situations where there is information imbalance between parties (information asymmetry). It is employed in decision-making problems as decision-makers rely on signals to avoid exploitation, to mitigate the potential for moral hazard and adverse selection, to decide whether to trust a person and to persuade others of one's trustworthiness (Gambetta and Hamill, 2005; Janney and Folta, 2006; Gambetta, 2008).

The underlying principles behind signalling theory describe the reliance on signals at an initial encounter with a signaller to solve problems of uncertainty and asymmetry of information when making choice decisions. There has been a strong case for the application of signalling theory at pre-contractual stages when decision makers decide on one's trustworthiness so as to mitigate the problems of adverse selections. For example: McNally (1995) who focuses on the signals to the pre-announcement of equities; Bulbulia and Sosis (2011) who looks at the signals to pre-committing members as indication of cooperative futures; and Mavlanova *et al.,* (2012) whose study was on pre-purchased signals in online retails examines the effect of signals on purchase intentions before the actual transaction takes place. These studies suggest that both high- and low-quality sellers rely on pre-purchased signals to indicate quality and to motivate buyers to transact. Consistent with the fundamental principles of signalling theory, this study seeks to determine the signals to look out for when selecting contractors for long-term collaborative relationships.

RESEARCH METHOD

Data for the study was elicited from the narrative experience of key informants of eight organizations in South Africa via semi-structured interviews. As typical to qualitative research methodology, participants are allowed to provide data in their own words and meanings will be informed from their point of view in line with the interpretivist philosophy (Saunders *et al.,* 2012). Sixteen key informants from the eight organisations which were purposively selected took part in the study. The key informants (comprising of directors, project managers, chairperson and executive managers) who took part in the study, do represent a diverse set of representatives

with different positions and from a wide range of backgrounds and experience in construction procurement, framework contracts and in the selection of contractors for framework contracts. The characteristics of the key informants who participated in the study conform to the suggestions for selecting key informants by Kumar (1989) and Marshall (1996). The organizations are then coded using the pseudonyms Alpha 1 to Alpha 8. The Key informant interviews involve interviewing people, who are selected for their first-hand knowledge about a topic of interest and are likely to provide needed information, ideas, and insights on the topic of interest (Kumar 1989; Marshall, 1996).

The interviews were audio recorded to ensure that all information was captured during the interviews. Also, brief notes were taken during the interviews to capture both verbal and nonverbal signals from the key informants. The audio record was transcribed verbatim. The data collected from the key informant interviews were analysed with the aid of the Nvivo 11 pro qualitative data analysis software for windows and following thematic qualitative data analysis methodology outlined by Miles, Huberman and Saldana (2014). The result of the qualitative analysis of the data collected was presented using a word cloud resulting from the word frequency query with the aid of Nvivo 11 pro qualitative data analysis software. The word cloud provides a synopsis of the main themes and a sense of the emerging pattern within the set of data. Also, supporting direct quotes from the key informants (consent was obtained to use key informants' direct quotes) was used in reporting the data of the study.

FINDINGS AND DISCUSSIONS

The data encompassing signals that encourage and indicates a contractor's suitability for long-term collaborative relationships were elicited from the key informants of the organizations under study. Figure 1 shows the prominent words across the data on the signals that encourage and indicates a contractor's suitability for long-term collaborative relationships. These are past-performance which consists of vetting with references, commitment including top management involvement, and active, participative involvement, quality of people and submissions, and willingness to participate. Others are related to behaviours characteristics such as openness, honesty, respect, and being realistic.

In a contractor selection process for long-term collaborative relationships, there may be increased information asymmetry between the clients and the potential contractors. Mainly as the appropriate attributes for long-term collaborative relationships are more of intangible attributes which are not quantifiable or can be measured directly. Signalling theory argues that when the attributes of an organisation or people cannot be directly observed, decision-makers must rely on signals thought to correlate with the underlying attributes (Drover *et al.,* 2018; Spence, 1974). Therefore, following the principles of signalling theory, this section will discuss what specific signal indicates the contractor's selection suitability for long-term collaborative relationships. Following a test run on each of the displayed words in Figure 1 to unravel the context and meanings using the Nvivo 11 pro software, the signals that encourage and indicate a contractor's suitability for long-term collaborative relationships are discussed below:

Figure 1 Word Cloud Depicting Prominence Words on Signals that Encourages and Indicates the Contractor's Suitability for Long-Term Collaborative Relationships.

Past-Performance Signalling

Signalling based on past-performance on previous jobs accounts for the display of the three words: ‘references', ‘records' and ‘previous' in the word cloud (Figure 1). Virtually all the organisations indicated Past-performance signals via their key informants as a vital signal that indicates a contractor's suitability for long-term collaborative relationships in a framework contract. To quote from the key informant's interview transcript:

> The only signal is when we cross-reference based on the previous job that they actually did. It is something that is abstract more than anything. It is difficult to measure that in the selection process. However, when you look at his previous track records and previous jobs, it can show this person has got the following attributes and character basically for collaboration and long-term relationships. So, we get CV's, ask them for three references, from the references we can deduct some information on whether to use them or not. Remember, all of them will tell you that they are fit for the job. Alpha7

Past-performance is indicated among the three primary criteria with the other two being financial stability and experience (out of 20 decision factors and 67 sub-factors for contractors' pre-qualification) for contractor selection decisions (Russell *et al.,* 1992). Since the attributes for long-term collaborative relationships are intangible and cannot be discovered directly by observation, contractor's past-performance serves as the best indicator of future performance in regarding long-term collaborative relationship attributes of contractors. It reduces the degree of uncertainties about the quality of potential contractors. Although it's not uncommon for a contractor who has performed well collaboratively in previous jobs to suddenly act out of character.

Commitment signalling

The process of selecting contractors for long-term collaborative relationships comprises of several stages including meetings, workshops and competitive dialogues (Ayegba and Root, 2018). The findings from across the data show that contractor’s commitments in all the tendering processes are an important signal that indicates a contractor's suitability for long-term collaborative relationships. Quoting from the key informant's interview transcript:

> It's subjective. Willingness to participate and present in all process and meetings... my common sense tells me that if a person is not keen to do a particular type of work, it's

> going to come through in the way his tender is prepared. You will pick it up as an experienced evaluator. Alpha 6

> Participatory involvement, if the contractor wasn't scared of telling the consultants to look at something in another way. Top management involvement, if their director was sitting in all our meetings from day one and he is a fairly knowledgeable person. Alpha 1

Therefore, Commitment signals concern not only attendance but also the contractor's willingness, participative contributions, the standard of tender and top management involvement in the various activities during the selection processes. The significant of top management involvement is such that can produce a skewed result against bigger contractor organisations with higher cidb grade level, in contrast, to lower cidb grade contractors whose top management are involved in selection processes as illustrated by Alpha 6:

> Do they have the right commitment? The best results often come from smaller contractors. We have had Grade 7s and 8s and 9s on both sides. The problem when you sit with a grade 9 is that it is a big corporate organisation…so have a big disjuncture between tendering and execution. You come to a grade 7 or 8 contractors, the guy sitting in front of you is the guy intimately involved in the tender and the execution, and he is the decision maker. So, the relationship with them is better. Alpha 6

According to Alpha 1, a commitment signal also involves the degree of openness and inclination to share risk with clients in a mutual gain and lost arrangement.

Behaviour Signalling

Clients look for certain behaviour signals which point to contractor's suitability for long-term collaborative relationships in a selection process. Gambetta and Hamill (2005) opined that certain behavioural properties such as honesty, benevolence, a long-term horizon, a pro-social upbringing positively influence the trustworthy guaranty of a person in many trust games including contractor selection for long-term collaborative relationships as is the "trust game" area of interest in this study. In agreement to Gambetta and Hamill (2005) opinion, the across case results of the findings from the organisations investigated (Figure 1) shows that being 'polite', 'honest', 'respectful' and 'realistic' are the significant behavioural signals that indicates contractor's suitability for long-term collaborative relationships in framework contracts. The following quotes from interviews transcript illustrate the display of these signals in a selection process:

> You know when you can tell or confirmed they are lying. When they over promise and are not being realistic. Alpha 1

> Take one example, somebody lied and said he developed A, B, C, and D for a client but when we called the client, he says no, there's no such a thing. This person did not develop that. So automatically we know that he is a liar. Alpha 7

> Mannerly behaviour, I am going to make an example where we had a painting contractor to go on site and quote. He was from another developer, and he was so rude with my guys on site that my site agent called me to tell me that we can let him quote but he must never come back to the site. Alpha 2

Drawing upon the principles of costly signalling (Zahavi, 1975), the behavioural signals are costless to good contractors to display and costly to imitate by a bad contractor for long-term collaborative relationships. Therefore, behavioural signals are a vital indication of the suitability of contractors for selection for in framework contracts given the demands for long-term collaborative relationships.

CONCLUSIONS

The exact observable signals that indicate a contractor's suitability for long-term collaborative relationships were empirically investigated in this study employing signalling theory. Signalling theory helps to explain how one can make a decision relying upon signals, which are perceivable indicators of non-directly observable qualities. The significant signals that indicates contractor's suitability for long-term collaborative relationships evidenced by virtually all the organisations investigated in the study include: Past-performance signals which serves as the best indicator of future performance in regards to long-term collaborative relationship attributes of contractors; commitment signals which not only concerns attendance but also contractor's willingness, participative contributions, standard of tender submissions and top management involvement in the various activities during the selection processes. The other signals are the behaviour signal which comprises of being polite, honest, respectful and realistic. The final verdict will involve taking a cluster of these signals into consideration. These findings are consistent with the predictions of signalling theory, and the presence of these signals will guarantee the rights decisions in selecting suitable contractors for collaboration and long-term relationships.

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