Antecedents and Consequences of Trust and Satisfaction in Main Contractor and Subcontractor Relationship

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Abstract. Recently, the concept of developing a good relationship was adapted in the construction project environment. The project participants are realizing that the trust and satisfaction are the key elements of relationship success. Main contractors played an important role in the most projects in the construction field, also commonly referred to as subcontractors. The objective of this research is to determine the complementary role of satisfaction and trust in building and enhancing the relationship between main contractor and subcontractor. This research began with the introduction of the theoretical framework comprising six dimensions sourced from the literature describing attributes of the relationship, such as contractor’s competence, motivation, reputation, communication, shared values, and conflict handling that may affect trust and satisfaction.

1. Introduction

The concise [1] defines the relationship as “the way in which two or more people or things are connected, or the state of being connected, or the way in which two or more people or groups regard and behave towards each other”. In reality, both parties must deliver their work and behave in such a way of giving benefits to each other. In business, especially in the construction industry, relationship, or known as business relationship, is a normal phenomenon when interaction between main contractor and subcontractor or the other organization has economic consequences in single transaction of products.

The significance of both trust and satisfaction is well acknowledged in literature related to relationship management in the construction industry; however, the important focus regarding the
interrelationship between these two parties has not been addressed properly. The objective of this research is to determine the complementary role of satisfaction and trust in maintaining and enhancing the relationship between a main contractor and subcontractor. The theoretical rationale for this proposed research is grounded on a discussion of how trust and satisfaction can reduce perceived problems and dispute, and we suggest that the issues of relationship commitment constitute different types of decision processes and the different types of perceived problems and disputes. We will also address the relationship bonds like contractor competence, motivation, reputation, communication, shared values, and conflict handling that may affect trust and satisfaction.

2. Theoretical Framework

The objective in relationship management in the construction industry is to establish, maintain and enhance the relationship to gain profit and the goals of both parties are met [2]. In their research on the ethical benefits of trust-based partnering presented that honesty or openness in communication, keeping promise, fairness, or reasonableness, mutuality or reciprocity, values or ethics and reputation are the important factors that influence a good relationship in construction industry.

The proposed framework (see Fig. 1) addresses the gap in the extant research by (i) highlighting the importance of trust and satisfaction in construction industry, (ii) suggesting the antecedents and consequences of trust and satisfaction in main contractor and subcontractor relationship, and (iii) extending the research of [3], [2], and [4] by exploring additional consequences of trust and satisfaction in main contractor and subcontractor relationship. [4]’s research is related to the ethical benefits of trust-based partnering and is the example of the construction industry, however in [3], consequences of trust and relationships are discussed and [4] studied the comparative evaluation.

Figure 1 Trust-Satisfaction Model.

2.1. Relationship Commitment

Commitment from both parties’ main contractor and subcontractor is crucial in a business relationship because without the when the relationship will not sustain, and finally relationship should contribute to the satisfaction of the involved parties. In research in marketing relationship, commitment was widely studied in the interaction between buyer and the seller [5].

H7a: Perceived satisfaction of the subcontractor increases the main contractors trust in the subcontractor. Relationship commitment exists when the exchange partner believes that an ongoing relationship with another partner is so important as to warrant maximum effort to maintain it. They believe that the relationships as worth if working on to ensure that it endures indefinitely [6].

H7b: Perceived satisfaction of the subcontractor increases the main contractor’s commitment in the subcontractor. Commitment has been identified as one of the key elements of successful relationships [6]. H7b : Perceived trust of the subcontractor increases the main contractors commitment in the subcontractor. In marketing relationship research, [7] defined commitment as actions or communications that lead to adaptation to specific customer needs. [7]’s research indicated that there are three "mind sets" which can characterize an employee's commitment to the organization, affective
commitment, continuance commitment, and normative commitment. This research explained the three components of commitment theory. Affective commitment is the employee's positive emotional attachment to the organization. An employee who is affectively committed strongly identifies the goals of the organization and desires to remain a part of the organization. In addition, continuance commitment is the “need” component or the gains versus losses of working in an organization and finally is normative commitment which is the individual’s commitments which remains with an organization because of feelings of obligation, and is the last component of organizational commitment. The same study has been done by [7] in inter-organizational relationships and adapts the same theory in their research.

2.2. Sources of Trust and Satisfaction

Construction workers needed benefits and rewards for their employers to make sure they were committed in delivering of works and service [8], [9]. Based on the literature, benefits and reward are derived as the motivational aspects that construction workers refer to as valuable outcomes of engaging and participating in the relationship. It will grow the relationship between employee and employers and will be improved beyond service performance in construction activities. However, the other aspects that influence motivational factors are pull and push motivation [10]. Pull motivation is derived from the internal and emotional aspects like culture of works; however, push motivation are connected to external motivations such as situation or cognitive aspects like social interaction and health.

H1: Perceived motivation of subcontractor increases the main contractor’s trust in the subcontractor. Most of the respondents in [2]’s research presented that they most prefer to trust an individual agreement rather than companies. However, the importance of the organization’s reputation consists of two reasons. Firstly, organizations build a reputation based on people’s feeling of comfort to work with them in projects. Organization’s reputations were very important indicators to build trust and influence potential to get intangible asset. Secondly, trust in relationship is reflected on inter and intra organizational relationships. An organization that has good reputation has authority to make decisions and transfer the information honestly and accurately.

H2: Good reputation will increase trust in the subcontractor. Competence has been identified as technical expertise and production methods, knowledge of markets, competitors, industry and customer’s organization [3]. In research conducted by [11], they found that the competent salespeople are more successful because they are expected to be good in communication, which will, reduce uncertainty and leads to building trust in relationships. The major strategy employed in developing a relationship is to influence the other party’s perceptions of one’s abilities or competencies [11]. They also argue that the result may be a stronger inter-organization relationship in the sense of higher target dependence and higher credibility for the source.

H3: Perceived competence of the subcontractor increases the main contractor’s trust in the subcontractor. Trust is a complex issue to be understood and many factors influence trust in a relationship [11]. According to the result of their research on ‘Building Trust in Construction Industry’ indicated that, three main factors emerged as important in building trust in construction projects which were honest communication, reliance, and process of delivery outcomes or feedback. [11] also reports that trust is also built up from the way of people communicating with each other and whether they are open and willing to share important information as a team members and be honest in relationship. However, types of communication also play roles in building trust when there is clear communication between people in construction projects that will cause effective feedback across their requirement to ensure better delivery of the project goals. [11] defined communication as the ability of the supplier to provide timely and trustworthy information.

H4a: Good communication will increase trust in main contractor and subcontractor relationship.
H4b: Good communication will increase satisfaction in main contractor and subcontractor relationship. Shared values in team building formed a basis of trust and satisfaction [11]. This element is highlighted for a few reasons, shared values mean that everyone contributes to complement a joint
task, rather than viewing their roles and goals as individual and separate in project teams. The understanding of shared values will lead to complementation of the project. The second reason of shared values is important as it has been experienced in mutual understanding between team members linked to the idea, positive actions, understanding of member’s position and appreciation in difficulties. Corporate culture indicated that sharing needs and values will create future relationship [12]. Furthermore, by sharing common values and being open also appear based on integrity, respect, and trust. Friman et al. [12] illustrates shared values as a critical facilitator in building good relationship. Shared values have been identified as the partners’ beliefs in common about the behaviors, goals, and policies, which are important or unimportant, right or wrong, and appropriate or inappropriate [8].

H5a: Shared values will increase trust with the subcontractor. H5b: Shared values will increase satisfaction with the subcontractor.

3. Research Methodology

The objective of the current research was to test the relative importance of trust and satisfaction on relationship commitment, respectively. As both decisions are affected by a number of business specific variables, we choose to limit our investigation to the main contractor of subcontractors. The external validity of the findings will be reduced, but it will create insight into the dynamic relationship of trust and main contractor satisfaction. [3]’s case study approach is in line with a proposed research process suggested by [12] in an early stage of theory development.

The selected main contractor is responsible for providing all of the material, workers, equipment, and machineries (such as engineering vehicles and tools) and services necessary for the construction of the project. The main contractor has objectives of developing successful relationships with its subcontractor in order to achieve a higher degree of contractor loyalty, and to develop cooperation with its subcontractors.

There are several stages of distributing a questionnaire, which were by post, mail and face to face distribution to the construction company. First stage involved preparing a cover letter for respondents’ information and stamped return envelopes were used. Based on a Malaysian wide postal questionnaire survey, the opinions of the main contractors were assessed on the relationship factors influencing main contractor and subcontractor relationship. A two page structured questionnaire was posted to 100 selected construction companies. A total of fifty 50 of postal questionnaires was received. It showed that construction company gives more positive responses during data collection process.

The second stage of data collection was that 100 online questionnaires were emailed to the key personnel in construction projects. Only 15 questionnaires were responded. However, the third stage of data collection gives more feedback by direct delivery to construction companies around Klang Valley and Johor Bahru. 450 survey questionnaires were sent out to the key personnel such as engineers, project managers, site supervisors, quantity surveyors and 90 construction companies. Follow up by telephone discussion within a week after the target questionnaire return date for those was not met. A total of 155 responded to the survey, 33.8 percent response rate, which is acceptable compared to other similar studies. These 155 responses also represented 60 companies (representing 66.6%); and 20 survey questionnaires were eliminated from the analysis due to incomplete responses.
The unit of analysis is the construction company. The responses from each company were totaled and the “median” was used to represent each company’s view. The “median” was selected in order to minimize distortions of data due to outliers from multiple replies from one company [12].

4. Analysis and Results

Table 1 shows the number of items per construct, means, standard deviations, skewness, kurtosis, and coefficient alphas. The coefficient alphas of more than six multi-items scales are all high, indicating reliable measures. In this research, Structured Equation Modeling (SEM) by using Partial Least Square (PLS) was used to maximize prediction rather than fit and suited for the theory [13]. The SmartPLS 2.1 software package was used to analyze the model developed for hypothesis testing [14]. PLS also has two types of evaluation models which the measurement model (outer model) and structural model (inner model). The measurement model (outer model) consists of convergent validity and discriminant validity, however, the structural model (inner model) was used for testing the hypothesis.

Table 2 summarizes the loadings obtained from PLS, the AVEs value, the alpha (α) values, and the composite reliability (CR). All elements in this table must be considered for measurement of convergent validity. Loading of respective constructs showed the reliability of the individual items. According to [15], cited by [13], the standardized loadings should be greater than 0.50. The loadings in the model should be eliminated from the measurement models if it is smaller than 0.5. According to [15] cited by [13], the composite reliability (CR) in internal consistency reliability should be higher than 0.70. However, according to [16], by [13] the value of cronbach’s alpha (α) coefficient value must be above 0.6 to be reliable. In this study, alpha value ranges from 0.842 to 1, which is indicating that the measurements are reliable.

Table 1. Statistical Description of Estimated Scales

| Construct | Mean* | St. Dev. | Skewness | Kurtosis | α   |
|-----------|-------|----------|----------|----------|-----|
| Comm      | 5.836 | 0.918    | -1.325   | 2.419    | 0.914 |
| Comu      | 6.044 | 0.848    | -0.826   | 1.047    | 0.900 |
| Comp      | 5.802 | 1.019    | -1.309   | 1.846    | 0.812 |
| Conf      | 5.836 | 0.940    | -0.829   | 0.532    | 0.902 |
| Mot       | 5.990 | 0.946    | -1.083   | 1.050    | 0.835 |
| Rep       | 5.970 | 0.869    | -1.228   | 3.317    | 0.919 |
| Satis     | 5.811 | 0.938    | -0.858   | 0.876    | 0.842 |
| Sha       | 5.940 | 1.095    | -1.326   | 1.317    | 0.819 |
| Tru       | 5.965 | 1.043    | -1.178   | 1.319    | 0.881 |

* Low scores indicate high degree

The other element that must be indicated is a value of Average Variances Extracted (AVE) which should be higher than 0.50. The higher value indicates that the latent variable explains more than half of its indicator’s variances observed in the items that were accounted by their hypothesized factors; therefore it is a sufficient degree of convergent validity values [14].

Based on [14], each construct of AVE (square roots of AVE) should be higher than the correlation among the constructs. Table 3 describes the discriminant validity of the model. The square roots of AVE were highlighted in bold and were greater than the correlation among the constructs (vertically and diagonally).

Therefore, it shows a significant result for the Fornell-Larcker criterion [13]. However, according to [17], cited by [13], discriminant validity in cross loading can be checked with the loadings of an indicator on its assigned latent variable and should be higher than its loading on all other latent variables.

According to [18], the standardized path coefficient indicates the strengths of the relationships between the independent and dependent variables, whilst the R2 value represents the amount variances explained by the independent variables [18].
Table 2. Quality Criteria (loading, ave, α, and cr)

| Assess. Item   | PLS Loading | AVE (AVE>0.5) | Alpha (α>0.6) | CR (CR>0.7) |
|----------------|-------------|---------------|---------------|-------------|
| COMMITT1       | 0.825       | 0.699         | 0.914         | 0.933       |
| COMMITT2       | 0.830       |               |               |             |
| COMMITT4       | 0.859       |               |               |             |
| COMMITT5       | 0.859       |               |               |             |
| COMMITT6       | 0.810       |               |               |             |
| COMMITT8       | 0.830       |               |               |             |
| COMMU1         | 0.861       | 0.715         | 0.900         | 0.926       |
| COMMU2         | 0.843       |               |               |             |
| COMMU3         | 0.825       |               |               |             |
| COMMU6         | 0.877       |               |               |             |
| COMMU8         | 0.820       |               |               |             |
| COMP1          | 0.844       | 0.726         | 0.812         | 0.888       |
| COMP2          | 0.846       |               |               |             |
| COMP4          | 0.867       |               |               |             |
| CONF1          | 0.869       | 0.773         | 0.902         | 0.931       |
| CONF3          | 0.884       |               |               |             |
| CONF5          | 0.861       |               |               |             |
| CONF6          | 0.902       |               |               |             |
| MOT1           | 0.868       | 0.751         | 0.835         | 0.901       |
| MOT2           | 0.877       |               |               |             |
| MOT4           | 0.855       |               |               |             |
| REP1           | 0.859       | 0.710         | 0.919         | 0.936       |
| REP3           | 0.845       |               |               |             |
| REP4           | 0.842       |               |               |             |
| REP5           | 0.840       |               |               |             |
| REP6           | 0.837       |               |               |             |
| REP7           | 0.835       |               |               |             |
| SATIS1         | 0.839       | 0.761         | 0.842         | 0.905       |
| SATIS3         | 0.864       |               |               |             |
| SATIS4         | 0.912       |               |               |             |
| SHAV1          | 0.871       | 0.807         | 0.881         | 0.926       |
| SHAV3          | 0.883       |               |               |             |
| SHAV4          | 0.939       |               |               |             |
| TRU1           | 0.844       | 0.711         | 0.919         | 0.936       |
| TRU2           | 0.836       |               |               |             |
| TRU3           | 0.837       |               |               |             |
| TRU4           | 0.846       |               |               |             |
| TRU5           | 0.850       |               |               |             |
| TRU7           | 0.847       |               |               |             |

Table 3. Discriminant Validity of Model

| Assessment Items   | COMM | COMMU | COMP | CONF | MOT | REP | SATIS | SHAV | TRU |
|--------------------|------|-------|------|------|-----|-----|-------|------|-----|
| COMMITMENT         | 0.872|
| COMMUNICATION      | 0.560| 0.880|
| COMPETENT          | 0.696| 0.603| 0.920|
| CONFLICT HANDLING  | 0.675| 0.495| 0.582| 0.933|
| MOTIVATION         | 0.648| 0.728| 0.639| 0.554| 0.878|
| REPUTATION         | 0.653| 0.565| 0.528| 0.529| 0.653| 0.892|
| SATISFACTION       | 0.684| 0.629| 0.717| 0.471| 0.502| 0.708| 0.898|
| SHARED VALUES      | 0.627| 0.501| 0.713| 0.454| 0.652| 0.485| 0.634| 0.917|
| TRUST              | 0.536| 0.663| 0.463| 0.640| 0.491| 0.535| 0.520| 0.560| 0.858|
The strongest relationship in the structure model is H7(b) which states that perceived satisfaction of the subcontractor increases the main contractor’s commitment in the subcontractor with a path coefficient of 12.120. Hypotheses H4(b), H3, H5(a), and H5(b) were rejected. However, the other hypotheses H4(a), H6, H8, H2, H7(a), and H1 were supported in this research.

Based on the result obtained from bootstrapping, not all the relationships were significant. The rejected hypothesis does not mean that there is no relationship at all. Lee at al. [1] identified that rejected hypotheses means that there is not enough evidence to support the hypothesis. Statistical analyses can never prove whether a hypothesis is true, but rather merely provide evidence to support or refute it. Fig. 2 shows the standardized path coefficient, their significance in the structural model, and the squared multiple correlations (R²) for an endogenous construct.

5. Conclusions

Based on results reported above, certain limitations of this study should be noted. This research examines the perceptions between main contractor and subcontractor. From the model development, a result shows that the consequence of trust and satisfaction is commitment. Therefore, the successful relationship between two parties can be a measured by of how thoroughly they work together. The data gathered from multiple sources would likely enhance the richness of the study.

This study presents multiple avenues for the future research. The results proved that satisfaction and trust may develop a good relationship between the main contractor and subcontractor. This is interesting which shows that the perceptions of the satisfaction and trust may have an effect on the overall relationship between the main contractor and subcontractor.

| Hypothesis | Relationships | Path Coefficient | t-value | Decisions |
|------------|--------------|------------------|---------|-----------|
| H4a        | communication → satisfaction | 0.612 | 13.156 **** | H0, Supported |
| H4b        | communication → trust | 0.116 | 2.386 | H0, Not supported |
| H3         | competence → trust | 0.107 | 1.947 | Not supported |
| H6         | conflict handling → satisfaction | 0.260 | 4.353 **** | H0, Supported |
| H1         | motivation → trust | 0.307 | 5.470 **** | H0, Supported |
| H2         | reputation → trust | 0.383 | 5.400**** | H0, Supported |
| H7a        | satisfaction → commitment | 0.504 | 12.120 **** | H0, Supported |
| H7b        | satisfaction → trust | 0.197 | 3.102* | H0, Supported |
| H8         | shared values → satisfaction | 0.076 | 1.444 | H0, Not supported |
| H8         | shared values → trust | -0.009 | 0.196 | H0, Not supported |

H0 = null hypothesis, H0 = acceptable hypothesis, *p<0.05, **p<0.001, ***p<0.0005, ****p<0.0001

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