A framework for trust in construction contracting

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Abstract

How trust establishes and sustains relationship has been widely studied in the fields of social science, economics, business and management. It has been suggested that trust helps to reinforce individuals’ affirmative willingness, confidence, expectation, belief, behavior and to overcome risk/uncertainty. However, trust building has been considered as impossibility due to the divergent interests of the contracting parties. As such, implementing trust in construction contracting has gained limited progress. This study aims to first conceptualize trust in construction by categorizing trust types according to their development bases. Based on a review on previous studies on trust, three major types of trust are identified; system-based, cognition-based and affect-based. To enhance trust-building, these trust conceptions were further reduced to trusting behaviors. In this respect, a trust framework in construction contracting was developed and tested empirically by the technique of structural equation modeling. The correlations of these three forms of trust in construction contracting are significant and close, with the coefficients of 0.99, 0.97 and 0.94 for cognition-based, system-based and affect-based, respectively. These support the statistical fit of the proposed trust framework in construction contracting. The empirical results suggested that all three forms are of almost equal importance in trust building. This reinforces the conventional wise down that trust building is easy to say than do. The three facets of trust co-exist and in factual are mutually dependent. A system is only as good as its weakest point, hence a trust building project manager must be able to install robust system, care for the stakeholders and team members. The trust framework thus enhances our outstanding how trust building can be practiced in construction contracting.

1. Introduction

How trust establishes and sustains relationship has been widely studied in the fields of social science [1–4], economics [5,6], business and management [7–10]. It has been suggested that trust helps to reinforce individuals’ affirmative willingness, confidence, expectation, belief, behavior and to overcome risk/uncertainty [7,9,11–13]. All these are contributive in maintaining amicable relationship as a trustful environment would help to bridge gaps, establish faith and synergize the strengths of members of an organization. According to Whitener et al. [9], the presence of trust can improve organizational culture through fostering ‘fair’ play. Trust prompts members to have faith in the organization and buy in its policies and procedures to create a collegial working environment. In construction, trust-building as one of the solutions to improve the relationship among contracting parties has therefore been widely discussed, particularly in the context of construction partnering [14–21]. Although trust has been recognized as a relationship lubricant, its implementation has not attracted the corresponding level of attention. Reducing these conceptions to an operational level, in particular for use in construction contracting shall be instrumental in view of the infamous adversarial environment. This paper reports a three-stage study for this purpose. The three stages of work are:

1. Reviewing trust-related studies from literature.
2. Proposing a Trust Framework in construction contracting.
3. Testing of the proposed Trust Framework.

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2. The study

2.1. Stage one: review on trust-related studies

In construction, trust building is often affiliated with the spirit of partnering. Hancher [14], a pioneer researcher in construction partnering, promoted the use of partnering instead of traditional approach as a means to improve contracting relationship. Cook and Hancher [15] built upon the work of Hancher [14] suggested that information sharing, such as exchanging organizational strategies or confidential information, is the essential trust-builder. It was reported that appropriate and honest information sharing can optimize mutual understanding and expectations among the partnering members by Cook and Hancher [15]. In general, partnering projects achieve better project quality and safety, create new direction of technology usage and make more business. ‘Mutual trust’ has been found to be one of the most important success factors in maintaining partnering relationship [16]. In the partnering studies by Bayliss et al. [18], Wong and Cheung [19,20], Wong et al. [21] and Cheung [22], it was identified that trust level between the client and contractor grows if trusting acts can be reciprocated. Wong et al. [23] obtained empirical evidence to support that performance, acting with integrity and demonstrating concern are antecedent to trust in their research with public sector organizations in Singapore. Zaghloul and Hartman [13] proposed the inclusion of competence, integrity and intuition as trust measures in the construction industry. However, their proposition based only on interpersonal trust and lacks objective solutions on risk allocation. Other trust-related studies in this field include those conducted by Huemer [24] and Kadeffors [25]. Huemer [24] associated trust-predictability with the redefinition of roles and relationships in construction projects. Kadeffors [25] proposed economic incentives, traditional contractual arrangements and informal co-operative relationships as the factors that influence trust development in construction projects. Previous researches on the contributions of trust in construction contracting therefore appear to direct their discussions in the improvements of time, cost and quality of construction projects, the relaxation of adversarial relationships and the promotion of co-operation. There is no shortage of the theoretical deliberations on trust contributions, however empirical evidence is uncommon. More significantly, little has been offered in conceptualizing these trust models in the context of construction contracting. Stage two of the study aims to achieve this research gap.

2.2. Stage two: proposing a trust framework in construction contracting

A trust framework in construction contracting is proposed by tracking the behaviors that characterize trust development with respect to the trust types identified in Stage One. Trusting behaviors involve elements of expectation, confidence, willingness, belief, behavior [7,9], reliance, hopefulness, optimism, honesty, mutuality, dependency, sharing of values, reciprocity, commitment, caring, responsibility [2,6,7,9], uncertainty and risk [6]. In addition, trust is a multi-dimensional concept that originates from different routes. In the light of the literature review on trust, it is proposed that trust be categorized into system-based, cognition-based and affect-based. Table 1 gives a summary of the trust types expounded in previous studies.

2.2.1. System-based trust

System-based trust focuses on formalized and procedural arrangements with no consideration on personal issues [2]. These arrangements establish trust and strengthen the communication channel between people in the society. They play a remarkable role in effecting proper functioning of organizations and the development of organizational relationships [9]. To develop system-based trust, organizational policy, communication system and contracts/agreements are considered as the three major attributes.

2.2.1.1. Organizational policy. Organizational policy specifies priorities and explains business procedures. It is a relevant indicator of an organization’s value system. Organizational policy reflects the expected behavior of the staff and the trust they have in the organization. Nonetheless, McKnight et al. [8] suggested that system-based trust can be developed and strengthened through one’s belief in the organizational policy in achieving organizational goals. Sufficiently flexible systems incorporating innovative management, congruent organizational structures and processes together with appropriate organizational culture provide the platform for trust development and maintenance [13,25]. Organizational policy is therefore a key nutrient for the development of system-based trust.

2.2.1.2. Communication system. Communication system defines the channels for interactions of an organization. Such interactions can be identified as either close or distant contacts. Meetings, workshops or visits are examples of close contacts while emails, telephones, and teleconferencing are examples of distant contacts. According to Gayeski [26], system-based trust can be enhanced through a clearly defined system of communication procedures and approaches. Not only does it facilitate convenient and speedy communications, it also reduces arguments that may arise due to distorted interpretations. As suggested by Zaghloul and Hartman [13] and Wong and Cheung [19], a good communication system mitigates risks and increases reputation of all concerned parties. An efficient communication system is therefore another indicator of system-based trust development.

2.2.1.3. Contracts/agreements. Contracts and agreements define relationships and obligations between individuals [8,13] and are regarded as another attribute of system-based trust because of their ability to reduce uncertainties,
minimize, share or shift risks among contracting parties [6]. Contracts and agreements explicate implicit expectations and make obligations and rights visible. This contributes to fair risk allocation, overall project performance improvement [25] and costs reduction [4]. With these, building system-based trust becomes possible.

2.2.2. Cognition-based trust

Cognition-based trust develops from the confidence built upon knowledge that reveals the cognitive bearings of an individual or an organization. The exchange of such knowledge can be attained by interaction or communication, formal and informal.

2.2.2.1. Communication/interaction. Communication/interaction is a means of imparting or exchanging information between individuals or organizations [5]. Continuing communication and interaction facilitate organizational members to distribute, comprehend and obtain information that can be translated into meaningful knowledge [26]. The absence of communication creates fears of exploitation and betrayal, which would result in avoidance of commitment to the team. Communication/interaction fosters mutual trust, which lays the foundation for growth in trust and business relationship [6,7]. Cognition-based trust brings about collaborative efforts that underpin project success. It also enables the working members to learn about the needs and capabilities of their partners. In the construction industry, communication has been identified as an effective means to reduce conflict [18].

2.2.2.2. Knowledge. Knowledge can be translated from information. Knowledge, such as track record, organizational role and financial status, reveals the consistency, competence as well as integrity of the individual or organization. This type of knowledge is critical in cognition-based trust development [11,12,19,24]. For example, Kramer [4] advocated that track record is a cognition-based trust building tool as it enables information acquisition and relationship enhancement. A person’s role in an organization,
his track record, reputation and professional standing are essential indicators of one’s trustworthiness [4,7]. Having the knowledge of past performance and reputation assures the relevancy and accuracy of the assessment of the reliability of this person [5]. Financial status comprises promises of the company’s commitment in promoting cognition-based trust [4] because it reflects the company’s capability to facilitate and enhance economic processes, manage risks and absorb shocks. In the construction industry, knowledge as discussed is essential for cognition-based trust building and toward project success.

2.2.3. Affect-based trust

Affect-based trust builds on a sentimental platform. It describes an emotional bond that ties individuals to invest in personal attachment and be thoughtful to each other [2]. Although Boon and Holmes [27] suggested affect-based trust development is restricted to romantic relationships, however it is believed that building up affect-based trust at work enhances the process of evaluation and information exchange, improves performance and well being of the teams [7]. Therefore, being thoughtful and emotional investments are proposed to describe affect-based trust development.

2.2.3.1. Being thoughtful. Being thoughtful can be demonstrated by showing care and concern [7]. It eliminates unfavorable attitudes and raises kind awareness of other people’s feelings [11,28]. Wright [28] noted the reciprocal nature of thoughtfulness which makes it an effective ingredient for improving work relationships and developing affect-based trust.

2.2.3.2. Emotional investments. Emotion is an affective state of consciousness often actuated by personal feelings. It is a mental state that happens spontaneously instead of through cognitive or volitional effort and is often accompanied by physiological changes. The attempt of an individual to make emotional investment illustrates his enthusiasm on spending time, energy and effort on a person that he thinks is good or helpful. Therefore, an individual’s willingness to invest his emotions on others demonstrates affect-based trust building. Affect-based trust derived from emotional investments reduces defensiveness, unhealthy competitiveness and disruption, eliminates frictions and enhances team spirit and morale in working relationship [27].

In the light of the above, a framework for trust in construction contracting is proposed and presented in Fig. 1. The three forms of trust, their attributes are included in this framework. Stage three of the study aims to confirm the underlying constructs of the proposed framework.

2.3. Stage three: testing of the proposed trust framework

This stage of the study aims to test the underlying constructs of the proposed trust framework. Firstly, data was collected through a questionnaire survey with construction practitioners. With these, a structural equation modeling analysis was then conducted.

2.3.1. Questionnaire survey – data collection

The trust attitude in construction contracting was collected through a questionnaire survey. The questionnaire was designed based on the proposed trust framework as described in Stages one and two of the study. Twenty-three trusting behaviors were long-listed. These are arranged trust types and its characterizing behaviors as presented in Table 2. This stage of the study is important in establishing the empirical bases, thus enhance the authenticity of the framework. The analytical results will also provide insight in the roles played by various forms of trust.

The respondents were asked to assess the degree of agreement on a seven-point Likert scale against each of the twenty-three statements. A higher score represents a higher level of agreement of the statement. In this study, a total of 467 questionnaires were sent to project managers, architects, engineers, contract/legal advisers, quantity surveyors and project coordinators. They were identified from the government and professional directories and web sites of companies. 163 of them responded to the survey, which represented a response rate of 34.9%. The respondents are experienced practitioners with over 70% of them having more than ten-year experience in this field. The study sample represented a broad spectrum of professional disciplines working as either client, consultant or contractor. These profiles are shown in Tables 3 and 4.

![Fig. 1. A framework for trust in construction contracting.](image-url)
2.3.2. The framework constructs

The construct of the trust framework is tested by a structural equation model (SEM). This technique seeks to determine whether the number of factors and the loadings of measured variables on them conform to what is postulated in theory [29]. With this method, each equation in the SEM model represents a causal link rather than an empirical association [34]. Furthermore, Goldberger [35] presented three situations to demonstrate the advantages of SEM over traditional multiple regression model: “(1) when the observed measurements contain measurement errors and when the interesting relationship is among the true or dis-attenuated variables; (2) when there is interdependence or simultaneous causation among the observed response variables and (3) when important explanatory variables have not been observed”. In this connection, appropriate goodness-of-fit indices of structural equation modeling are used to confirm the ‘fitness’ of the framework. Model fit indicators include relative chi-square ($\chi^2/df$) < 2.00 [30], Goodness of Fit Index (GFI) > 0.80 [31], Comparative Fit Index (CFI) > 0.80 [31], Tucker-Lewis coefficient (TLI) > 0.80 [31] and Root Mean Square Error.

Table 2
Trust types and its characterizing behaviors

<table>
<thead>
<tr>
<th>Trust types</th>
<th>Attributes</th>
<th>Trusting behaviors</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>System-based</td>
<td>Organizational policy</td>
<td>II8. Sufficient organizational resources in response to contracting parties' needs increase the sense of belonging to the organization</td>
<td>Caldwell and Clapham [12]; Cheung et al. [17]</td>
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<td></td>
<td></td>
<td>II12. An organization should clearly define the job tasks required of individuals</td>
<td>Cheung et al. [17]</td>
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<td></td>
<td></td>
<td>II14. Good management of organization system reinforces goal achievement such as continual improvement, profit making and business expanding</td>
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<tr>
<td></td>
<td></td>
<td>II23. Organization policy should be clearly specified for solving cost, time, risk and safety issues</td>
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<tr>
<td>Communication system</td>
<td></td>
<td>II4. Using effective communication methods are essential at work</td>
<td>Cheung et al. [17]</td>
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<td></td>
<td></td>
<td>II9. Formal communications with working partners should be documented in a systematic way</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>II21. Keeping a good communication system would avoid ambiguous situations and discrepancies occurring at all times</td>
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<tr>
<td>Contracts and agreements</td>
<td></td>
<td>II2. A clearly defined contract document brings confidence and comfort to all parties</td>
<td>Cheung et al. [17]; Wong and Cheung [19]; Wong et al. [21]</td>
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<td></td>
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<td>II15. Information in the contract document should be explainable to parties who may be affected</td>
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<td></td>
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<td>II16. Clarification of contract terms and agreements is important before the commencement of work to minimize future arguments</td>
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<tr>
<td>Cognition-based</td>
<td>Communication/interaction</td>
<td>III. Keeping a long-term relationship with the other party has the benefit of maintaining better communication between individuals</td>
<td>McAllister [7]; Cheung et al. [17]; Wong and Cheung [19]</td>
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<td></td>
<td></td>
<td>III10. Good interaction allows me to obtain more information from the other party</td>
<td></td>
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<td></td>
<td>III13. Attending work-related interaction frequently facilitates better understanding between individuals</td>
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<td></td>
<td></td>
<td>III18. Open and honest communication enables more work-related information exchange between individuals</td>
<td></td>
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<tr>
<td>Knowledge</td>
<td></td>
<td>III3. Track record is an essential tool to judge the other party’s competence and consistency level</td>
<td>McAllister [7]; Wong and Cheung [19]</td>
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<td></td>
<td></td>
<td>III5. Financial stability is one of the factors in evaluating a company’s reliability</td>
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<td></td>
<td></td>
<td>III7. The other party will have confidence to work with me if I have a good reputation of being honest</td>
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<tr>
<td>Affect-based</td>
<td>Being thoughtful</td>
<td>II19. Showing care and concern to my workmate at appropriate time impresses his/her feeling more comfortable to work with me</td>
<td>McAllister [7]; Kanawattanachai and Yoo [11]</td>
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<td></td>
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<td>II20. Being considerate is a tool to understand an individual’s needs and feeling at work so as to achieve his/her maximum capacity</td>
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<td></td>
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<td>II22. Taking each party’s needs into account in decision making process encourages a compromising and satisfactory outcome</td>
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<tr>
<td>Emotional investments</td>
<td></td>
<td>II6. Having a good personal relationship with the other party may also improve working relationship with him/her</td>
<td>McAllister [7]; Zaghloul and Hartman [13]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>III1. I am more likely to rely on a working partner whom I have good impression</td>
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<td></td>
<td></td>
<td>III7. Spending appropriate time, energy and effort to understand other party’s personal details and work background eliminates frictions between each other at work</td>
<td></td>
</tr>
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</table>

Table 3
Profile of respondents (by organizational types)

<table>
<thead>
<tr>
<th>Organizational types</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>29.45</td>
</tr>
<tr>
<td>Consultant</td>
<td>27.61</td>
</tr>
<tr>
<td>Contractor</td>
<td>42.94</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
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</tbody>
</table>
of Approximation (RMSEA) < 0.08 [29]. Moreover, the relationship of each variable can be determined by the use of path analysis that estimates the strength of each relationship in a model [29]. A path coefficient is a standardized regression weight to be considered when discussing the regression. It shows the direct effect between a pair of independent variable and dependent variable in the path model. The greater the path coefficients, the stronger the evidence that the measured variables are representing the underlying paradigms [30]. The advantage of using path coefficients is simplicity of exposition.

2.3.3. Statistical fit of the framework

In order to perform the confirmatory factor analysis, the trust framework was arranged as a structural equation model as shown in Fig. 2. The five goodness-of-fit indices

![Fig. 2. A structural equation model of the trust framework in construction contracting.](image-url)
were obtained by running Amos 5, a software designed for conducting structural equation modeling. The goodness-of-fit indices obtained are $\chi^2/df = 1.89$, GFI = 0.81, CFI = 0.89, TLI = 0.88 and RMSEA = 0.07. Comparing to the statistical requirements of goodness-of-fit indices, the results were considered satisfactory. Therefore, the proposed trust framework is supported.

Path analysis was then carried out to determine the relationship among the variables. Fig. 3 shows the output of the path analysis which shows that the path coefficients for system-based, cognition-based and affect-based trust are 0.97, 0.99 and 0.94. Comparing the path coefficients of these three forms, cognition-based trust scored the highest, which suggests that cognition-based trust to be the most important form of trust among the three. The two attributes of cognition-based trust are also having high path coefficients. Path coefficient between communication/interaction and cognition-based trust was 0.99 and the one between knowledge and cognition-based trust was 0.95.

3. Discussion

Cognition-based trust describes a trusting relationship that builds on mutual understanding through fruitful information exchange and acquaintance. Construction projects
require team members of different expertise working together. Thus, good co-operation is desirable in order to complete a project at a minimum cost, least time and best quality. Communication/interaction forms the bridge for daily information exchanges because working members have to rely on what they have been provided. Such reliance enables trust building. It is therefore not surprising that keeping good communication/interaction develops cognition-based trust. Moreover, information is also very important in the construction industry, especially at the planning stage of construction projects. Clients place much attention on and acquire information from the record of consultants and contractors. In the construction industry in Hong Kong, the government has a system of consultants’ performance evaluation and selection of contractors. The consultants’ past performance is reported and evaluated according to the Technical Circular No. 19/2004. Unsatisfactory performance will lead to suspension from bidding for future consultancies. The tender evaluation of contractors is detailed in the Technical Circular No. 8/2004 in which scores will be given according to the tenderer’s experience, past performance, technical resources and technical proposal. These assessments collectively account for 40% of the total assessment, hence can be decisive in bid evaluation. It can be seen that construction practitioners have great interest in getting hold of information of each other because of the benchmarking function. Consequently, a company or an individual who has a wealth of information that can be translated into knowledge is more likely to be trusted by others.

System-based trust has the second highest path coefficient. Its attributes; organizational policy, communication system and contracts/agreements, are also having high path coefficients with system-based trust. In construction, a contract document that includes conditions of contract, specifications, bills of quantities and contract drawings details the rights and obligations of the contracting parties. This is also instrumental in facilitating system-based trust. Basically, achieving the stipulated requirement is the first and foremost step in deriving system-based trust. It is because the systems are stipulated in the contract, in particular those related to performance. Fulfilment of the system requirements brings about the confidence of the contracting parties and therefore activates trust. Effective communication is a pivotal to the smooth running of a project. Regular contacts like progress meetings, technical meetings, quality control workshops, site safety workshops or site visits are typically scheduled so that performance can be monitored. Other channels, like emails and telephones, have become more and more important and efficient means for information exchange.

Organizational policy describes the strategic settings of an organization, thus guides decision making in business execution. In other words, an organization speaks and acts through its policies. Thus, policy is having a major impact on how organizational members view the company. This perception influences organizational members’ sense of identification with the company and its objectives. An enduring organizational policy is important to any organization as it can be viewed as its identity. Construction work often requires group efforts whereby proper administration guidelines help connecting team members and developing trust among them. Organizational policy therefore becomes a critical system as the working members’ performance guidebook.

Affect-based trust is comparatively the least influential among the three forms of trust (path coefficient 0.94). Nonetheless, its attributes of being thoughtful and emotional investments are having high path coefficients of 0.92 and 0.99, respectively. Both of these attributes are grounded on intuitive elements and relate to personal feelings and subjective decision. Nonetheless, professionals should not compromise on quality standard, especially factors like personal feelings are indeed controllable. Therefore, investment of emotion at work should be minimized at work. The suggestion does not negate the existence of affect-based trust in the construction industry as showing certain level of care, concern and being considerate would help in promoting a trusting work relationship. The caveat is not being carried away for taking things too personal.

4. Concluding remarks

Trust has been identified as the most important behavioral factor in managing relationship. In construction, where collaboration among contracting parties is essential in order to accomplish sophisticated tasks that require multi-parties involvement, successful trust building within project team would certainly improve the project outcome. Despite this obvious advantage, trust appears to be a stranger in construction contracting where confrontation remains the prevalent environment.

This study aims to further the understanding of trust in construction contracting. Firstly, trust concepts were reviewed. Categorization was then developed to put these conceptions in perspective. A trust framework in construction contracting was then developed by reducing these trust conceptions to behavioral statements. The constructs of the framework were then tested empirically through the technique of structural equation modeling. The study identified three broad types of trust: system-based, cognition-based and affect-based. Cognition-based trust is built on knowledge and understanding. System-based trust is founded on performance and faith in the system. Affect-based trust appears to address the feelings and emotion, thus tends to be more personal. The empirical results suggested that all three forms are of almost equal importance in trust building. This reinforces the conventional wise down that trust building is easy to say than do. The three facets of trust co-exist and in factual are mutually dependent. A system is only as good as its weakest point, hence a trust building project manager must be able to install robust system, care for the stakeholders and team members. The trust frame-
work thus enhances our outstanding how trust building can be practiced in construction contracting.

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