

# Conceptual Client Value Index for Post Disaster Reconstruction Contracting Services

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## Abstract

To improve client value within contracting services, it is important to understand what clients value and what their priorities are. Following a disaster event, construction service providers are called by clients upon to assist with reconstruction programs. Having knowledge of client values within contracting services in the post disaster situation, service providers are able to provide better service in the disaster rebuild environment. The construction management literature is focused on business-as-usual construction and its relative values, rather than post disaster reconstruction. The objective of this paper is to explore the most important client values within contractor's services in post disaster reconstruction situations from public and private sector clients' perspectives. The study includes a literature review and questionnaire survey. Key client values within contracting services under the nine Project Management Institute knowledge management categories were identified. These values can be used as a basis for developing good practice for reconstruction following a disaster. As part of a aim to develop an assessment tool towards improving client value, by providing better contracting services, a client value index is proposed.

Keywords: *contractor, contracting services, client value, post disaster reconstruction, values*

## 1. Introduction

Following a disaster event, there is a urgent need for client to develop an effective contractual system for rebuilding (Zuo, 2010), as contractors are called by clients upon to assist with reconstruction programs (Wilkinson *et al.*, 2016). Contractual systems include the client values for management of design and construction services (Masterman, 2003). An entity who provides any construction services should comply with these client values (Yang and Peng, 2008). To ensure satisfactory delivery of the client values, a concerted effort is required to understand the client values (Ahmed and Kangari, 1995). To help achieve this, it is necessary for contractors to understand how to perform effectively in post disaster situations (Wilkinson *et al.*, 2014). However, studies (e.g. Lyons, 2009; Ika *et al.*, 2012; Kim and Choi, 2013) show that the contracting parties in reconstruction following a disaster often fail to achieve the project objectives and satisfy their clients. One of the main causes of these failures is the fact that post disaster reconstruction programs are often ad hoc and therefore without a sufficient management and procurement

systems (Shaw *et al.*, 2003; Zuo, 2010). There is a need for developing a good practice within contractual mechanisms that defines the client values within constructing services and ensures that the provided services will satisfy the client.

This study's aim is investigating what clients value from contractors services in post disaster situations and aiding the service providers to more well informed decisions and reconstruction efforts. If contractors are aware of client expectations, they can better prepare for disaster reconstruction situations and provide improved services to clients. Understanding client values can help reconstruction practitioners to prepare good practices and recommendations for reconstruction works, particularly, in developing a contractual system suitable for reconstruction programs. Through a survey with experts from leading reconstruction-related organizations in public and private sectors, the most significant client terminal and instrumental values within contractor services are identified. Selection of the different types of client helps the authors to obtain different views, if any exists. Finally, a series of weighted values are combined into a conceptual client value index (CVI).

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## 2. Understanding What Clients Value from Contractor's Services

While procuring a service within a reasonable cost, quality, and time (Soetanto and Proverbs, 2002; Hatush and Skitmore, 1997) is clients' main objective, they can still be dissatisfied if explicit time, cost and quality have been met (Torbica and Stroh, 2001). Achieving compliance with those traditional measures "no longer represents excellent performance. Rather, such compliance tends to be viewed as the minimum performance requirement on construction programmes" (Butcher and Sheehan, 2010). Clients are often knowledgeable about the construction delivery process and they expect the best possible value from their service providers. As a part of this expectation, they want a high level of attention to all of their needs (Egemen and Mohamed, 2006; Yasamis *et al.*, 2002). Achieving client perceived value within any form of procured services largely depends on the fulfilment of the client values. The ultimate value of procured services (from a client's perspective) is dependent on the value of the client's initial expectations. Construction clients make a decision to choose a contractor who is able to complete the clients' projects while meeting the clients' expectations. While the clients make that selection decision, they build their expectations based on values they expect to receive as a consequence of their decision (Yasamis *et al.*, 2002).

To evaluate and improve client value within contractual relationships, it is important to understand what different clients value and what their system of value priorities are. Sirkin and Stalk (1990) and Ahmed and Kangari (1995) highlighted the benefits of understanding what clients value and to concentrate on those values. They stated that having knowledge of what clients value, service providers were able to understand the causes of their service problems, and implement changes to address these problems. Ahmed and Kangari (1995) highlighted time, cost, quality, client orientation, communication skills, and response to complaints as the values that clients perceive as being most important when dealing with contractor organizations. Murphy (1999) introduced a model to assess client perceived value within consultancy relationships. The study explored that contracting parties need to have awareness of client perceptions with three aspects of provided services (such as technical, personal, and ultimate project outputs) in order to satisfy their clients. Mbachu and Nkado (2006) developed a conceptual framework for assessing client needs in the building development process. They analysed the levels of importance of client values, and performances of service providers in fulfilling those values. Results of their study indicated that services delivery within agreed time, cost and quality targets are clients' utmost expectation for contracting services, while accommodating clients' changes in good faith is the most critical area for improvement. Boyd and Chinyio (2008) classified client values in two groups such as terminal values and instrumental values. In construction, the terminal values are realized by criteria related to time, cost, and quality, while criteria such as communication, relationships,

coordination are at the core of the instrumental values (Boyd and Chinyio, 2008). Terminal values are the final goals that individuals make for themselves, while instrumental values can be considered as a means to an end (Kluckhohn, 1951; Boyd and Chinyio, 2008). Satisfaction can be perceived by achievement of terminal values through instrumental values. Meng (2012) by analysing the effect of relationship management on construction project performance, indicated that satisfactory delivery of construction services with respect to time, cost, and quality is highly associated with instrumental values such as collaborative working, open communication, and effective problem solving, respectively. Instrumental values are the competencies required for managing the contractual relationships in any type of construction project and should be treated as intangible assets in construction organizations (Zou *et al.*, 2014; Voss and Kock, 2013; Erik Eriksson *et al.*, 2009).

Despite the availability of various studies to explore client values for evaluation of contracting services, they were focused on business-as-usual construction situations. This is due to the fact that "research on post disaster reconstruction is a relatively new topic with rapid development potential" (Yi and Yang, 2014). The available studies can be accustomed with several shortcomings for applicability of their findings in post disaster situations. For example, while they defined values which can be useful for post disaster reconstruction, it is the weightings of these values to specific circumstances of reconstruction programs that are more essential. Hence, exploring client priorities within contracting services in post disaster situations can be of great importance in overcoming the shortcomings. Reconstruction programs can be carried out by modifying construction processes in business-as-usual situation on an ad hoc way following a disaster (Rotimi *et al.*, 2009). While such modifying can be effective for reconstruction works following small scale disasters, there is a greater imperative to have appropriate systems in place in advance, to improve effectiveness of reconstruction delivery for larger scale disasters (Rotimi *et al.*, 2009).

## 3. Research Steps and Methods

This study was conducted in three steps: (1) identifying assessment values for post disaster reconstruction, (2) Identifying the most important values in each project management category, and (3) developing a client value index (CVI). The specific methods used include a literature review and a questionnaire survey.

### 3.1 Defining Client Values within Contracting Services in Post Disaster Situations

The construction management literature is focused on business-as-usual construction. Client values and their prioritizations for post disaster reconstruction can be identified based on expert opinion. The importance of experience possessed by project experts in relation to project results has been accepted in the construction management literature to assess contractual relationship outcomes (Ibrahim *et al.*, 2014; Chua *et al.*, 1999). "It would be

legitimate then to assume that experienced practitioners could composed a set of critical success factors after testing against their experience” (Chua *et al.*, 1999).

Two steps were employed by the research team to capture client values within contractor service in post-disaster reconstruction projects. In the first step, a comprehensive review of the available literature was undertaken to identify the client values. The databases searched as part of the research literature review included 177 papers (out of 898 selected papers). A list of client values (140 in total) was developed based on the review of the selected papers. For further detailed description of the search history and the methods of analysis adopted to identify the client

values, refer to Aliakbarlou *et al.* (2017a).

Because the identified values were varied in term of their type and characteristics, categorising these values under the nine Project Management Body of Knowledge (PMBOK) objectives of time, cost, quality, integration, scope, human resource, communication, risk, and procurement (PMI, 2005) seemed reasonable. Assessing contracting services performance (within the nine PMI objectives) in the form of monitoring and controlling is essential to effective project management (PMI, 2005). The identified values were also categorized into terminal values and instrumental values.

Following the review, in the second step, 16 experts from

Table 1. Values' Mean and Rank based on 59 Public and Private Participants' Responses

Type	PMBOK category	Values	Mean	Rank	
Terminal	Time	Shorter contract time	4.441	2	
		Timeliness	4.525	1	
		Delivery speed in construction process and lead time	4.390	3	
	Cost	Lower contract price	4.190	2	
		To budget delivery/appropriate to budget	4.305	1	
		Value for Money	3.712	3	
	Quality	Higher standard of quality	4.196	1	
		Information system adequacy	3.898	2	
		Accuracy of decision making and process	4.052	3	
		Improved organizational culture	3.661	4	
	Instrumental	Integration	Commitment to constant client satisfaction	4.316	2
			True friendship/partnerships with all parties	4.102	6
Closer relationship/flexibility in relationship			4.172	4	
Building a trust based relationship			4.379	1	
Long-term business relationship			3.780	7	
Continuous learning & improvement			3.576	8	
Minimized construction aggravation, dispute & conflict			4.190	3	
Efficient problem resolution procedure			4.138	5	
Scope		Efficiency of construction methods & techniques	4.086	2	
		Appropriate tangibles (site facilities, documentations, claims & reports)	3.627	5	
		Competency	4.424	1	
		Understanding client	4.000	3	
		Accuracy of variations/invoices & claims	3.983	4	
		Potential for innovation & creativity	3.475	6	
Human resource		Internal teamwork development	4.220	2	
		Productivity of staff	4.276	1	
		Efficiency of leadership & coordination	4.136	3	
		Employee empowerment	3.414	5	
Communication		Perceived prosocial behavior	3.932	4	
		Communication technique & documentation	4.328	1	
Risk		Accessibility & responsiveness	4.190	2	
		Security, health & safety	4.140	4	
		Environmental protection	3.610	5	
		Providing necessary guarantees/assurance	4.190	3	
	Financial stability during a relationship	4.345	1		
	Maintaining reliability through risk management	4.220	2		
Procurement	Availability of resources (material, labour, & plant)	4.475	1		
	Capability of sourcing	4.254	2		
	Willingness of use of local resources	3.881	3		

leading reconstruction-related organizations in New Zealand participated in a survey interview. The list of client values was provided to the interviewees, and the practitioners were requested to select the most important values for post disaster reconstruction from the list. They were also asked to recommend as many additional suitable and practical candidate values which were not included in the list (Aliakbarlou *et al.*, 2017b). This resulted in a total of 39 key client values being identified (as shown in Table 1). The 39 identified values provide a comprehensive set of client values within contractor services and form the basis for developing good client-contractor working relationship in post disaster reconstruction projects.

### 3.2 Identifying the Most Important Values

Having carried out a literature review, supplemented by interviews, on the client values required for assessment of contractor services in post disaster reconstruction, a survey questionnaire was developed. Out of the 180 questionnaires sent out, 59 sets of completed survey questionnaires were received and analysed. This equates to a response rate of 33%.

The first section of the survey questionnaire captured the respondent's profile. All the respondents were experts in construction management, and had an average of 5 years experience in managing reconstruction projects. In addition, they had clear ideas about contractor evaluation. There were 25 respondents from public sector clients (42%) and 33 respondents from private sector clients (58%). The questionnaire also captured the respondents' profession (director, 12%; decision maker/advisor, 36%; project manager, 30%; engineer, 14%; and quantity surveyor, 8%).

The second section of the survey questionnaire listed the client values that had been identified through the literature review and the interviews. The survey questionnaire aimed to discover the levels of importance of the 39 values. The respondents were asked to rate the extent to which each of the values are important to them using a 5-point Likert scale (1 = least significant, 2 = slightly significant, 3 = significant, 4 = very significant, 5 = most significant) (Chan and Kumaraswamy, 1996; Park, 2009).

The values were ranked using the mean value ranking method (Chan and Kumaraswamy, 1996; Park, 2009). The computed

mean ranking was used to identify the most important values in each project management category. Park (2009) used the mean ranking method to define the most important whole life performance factors in construction projects within different categories.

An analysis of the obtained data from the survey revealed that, in general, both public and private clients have similar levels of expectation for the identified values. In the construction literature (Soetanto *et al.*, 2001; Tang *et al.*, 2006; Ling, 2004; Mir and Pinnington, 2014), Pearson's correlation analysis has been widely applied in order to investigate the extent of agreement between the opinions of different respondents. In this study, the application of the Pearson's correlation analysis indicates that there is high agreement between the opinions of public and private respondents. The correlation coefficient between public and private clients' responses was 0.770. According to Hinkle *et al.* (2003), this indicates a high correlation between all respondents regarding relevance and importance of values. Hence, due to the similarity between both types of respondents, the authors used the overall computed means (as shown in Table 1) in order to define the most important values in each project management category.

Table 1, divides the identified values into two types of terminal and instrumental values, and classifies them under the PMBOK knowledge categories. Table 1, exhibits the rank and mean ratings of the values obtained from responses of 59 public and private clients participants.

An analysis of the data in Table 1, shows that 'timeliness', 'to budget delivery', 'higher standard of quality' are the most significant client terminal values. 'Availability of resources', 'competency', 'building trust based relationship', 'financial stability during a relationship', 'communication technique & documentation', and 'productivity of human resources', and can be regarded as the most important instrumental values for post disaster reconstruction in each project management category.

## 4. Development of a Client Value Index (CVI)

The following is an attempt to develop a Client Value Index (CVI), as a first step towards judging the client perceived value within contractor services. To avoid the development of a

Table 2. Rank, Mean and Weighting of the Values and Categories

Categories	Description Values	Mean		Rank		Weight	
		Values	Categories	Values	Categories	Values	Categories
Terminal	Time: Timeliness	4.525	4.342	1	2	0.5	0.333
	Cost: To budget delivery	4.305		2		0.333	
	Quality: Higher standard of quality	4.196		3		0.166	
Instrumental	Procurement: Availability of resources	4.475	4.371	1	1	0.285	0.666
	Scope: Competency	4.424		2		0.238	
	Integration: Trust	4.379		3		0.19	
	Risk: Financial strength and stability	4.345		4		0.142	
	Communication: Technique & documentation	4.328		5		0.095	
	Human resources: Productivity	4.276		6		0.047	

complicated and impractical model, it was decided to use one value criterion from each category to make the CVI easier to develop and also practical to use. Using a limited number of factors for each category to develop a performance model has been supported by various authors (Cheung *et al.*, 2003; Ibrahim *et al.*, 2014; Yeung *et al.*, 2007; Frödell *et al.*, 2008). For example, Frödell *et al.* (2008) highlighted the use of a limited number of assessment factors as a key characteristics of performance assessment systems. According to Cheung *et al.* (2003) and Yeung *et al.* (2007), to avoid complexity and impracticality of performance assessment system models the number of assessment factors should not be extensive. Ibrahim *et al.* (2014) included only one factor under different categories for developing a model to assess team integration.

Consequently, in this study only one value criterion from each category, based on their level of importance, was selected to develop the CVI. Table 2 in the next subsection shows these selected values along with their categories.

#### 4.1 Composition of The CVI

In order to formulate a client value index (CVI) for post disaster reconstruction, the identified values were ranked based on their overall mean scores (Table 2 - column 3) provided by the questionnaire survey respondents. The weightings of the respective values were then calculated based on the defined rankings for the nine values (Table 2 - column 5). The weighting for each of the values was computed by using the rank sum approach. The rank sum method is a direct weight elicitation method which provides a compromise with good quality (Ibrahim *et al.*, 2013) while requiring a modest assessment effort (Jia, 1997).

To use the rank sum method, the criteria need to be ranked based on their relative importance and then each criterion is weighted in proportion to its ranked order position. The following equation was used to compute the rank sum weight (Buede and Miller, 2016; Buede, 2009).

$$W_i = \frac{K - r_i + 1}{\sum_{j=1}^K K - r_j + 1} \tag{1}$$

where:  $K$  = Defines the total number of ranked values  
 $r_i$  = Defines the rank position of the  $i^{th}$  value criterion  
 $W_i$  = Defines the weighting of the  $i^{th}$  value criterion  
 $\sum_{j=1}^K K - r_j + 1$  = Defines the summation of rankings of the values.

Based on the determined weightings as shown in Table 2, the CVI is computed by the following formulas for terminal and instrumental values:

$$CVI (terminal) = 0.500 \text{ Timeliness} + 0.333 \text{ To budget delivery} + 0.166 \text{ Higher standard of quality} \tag{2}$$

$$CVI (instrumental) = 0.285 \text{ Availability of resources} + 0.238 \text{ Competency} + 0.190 \text{ Building a trust based relationship} + 0.142 \text{ Financial strength and stability} + 0.095 \text{ Communication technique \& documentation} + 0.047 \text{ Productivity} \tag{3}$$

In construction literature, multi-attribute measures have been used to assess overall client satisfactions within different service provides and different type of services (Mbachu and Nkado, 2006; Handy, 1977). In this study, a multi-attribute CVI is computed by the following formula including both terminal and instrumental values:

Table 3. Correlations Matrix

		Trust	Competency	Timeliness	To budget delivery	Higher of standard quality	Productivity	Communication technique & documentation	Financial stability	Availability of resources
Trust	Correlation	1	.079	.165	.051	.073	.190	.293*	.028	.168
	Sig. (2-tailed)		.554	.215	.704	.596	.157	.027	.837	.207
Competency	Correlation		1	.168	.232	.085	.013	.469**	.078	.320*
	Sig. (2-tailed)			.204	.077	.533	.922	.000	.561	.013
Timeliness	Correlation			1	.069	.013	.031	.385**	-.028	.160
	Sig. (2-tailed)				.602	.925	.818	.003	.835	.228
To budget delivery	Correlation				1	.413**	.263*	.121	.175	.182
	Sig. (2-tailed)					.002	.046	.365	.189	.168
Higher of standard quality	Correlation					1	.368**	.231	.062	.180
	Sig. (2-tailed)						.006	.090	.655	.183
Productivity	Correlation						1	.134	.021	.371**
	Sig. (2-tailed)							.320	.874	.004
Communication technique & documentation	Correlation							1	.206	.272*
	Sig. (2-tailed)								.125	.039
Financial stability	Correlation								1	.038
	Sig. (2-tailed)									.775
Availability of resources	Correlation									1
	Sig. (2-tailed)									

\*Correlation is significant at the 0.05 level (2-tailed)

\*\*Correlation is significant at the 0.01 level (2-tailed)

$$CVI \text{ (multi-attribute)} = 0.333 \text{ CVI (terminal)} + 0.666 \text{ CVI (instrumental)} \quad (4)$$

Similar to studies by Yeung *et al.* (2007), Ibrahim *et al.* (2013), and Xia and Chan (2012), in order to develop a simple and practical model, the CVI is computed as a linear additive weighting model. The composition of a linear additive weighting model is justified by the fact that the nine selected values, all from different categories, have different characteristics and, hence, a multiplier effect between them is unlikely. Also, a Pearson correlation analysis of the 9 values with the results shown in Table 3 indicates that the nine selected values are not highly correlated with each other at the 0.05 level of significance. In fact, the majority of them are insignificantly correlated with each other. Hence, according to Yeung *et al.* (2007), and Xia and Chan (2012), it is valid to adopt a linear and additive model.

In addition, the included values within the index not only have different characteristics, but are assessed by different units of measurement – so a multiplier effect between them is not likely (Yeung *et al.*, 2007). For example, quality and to budget delivery are evaluated by different measurements or assessment criteria. Hence, it can be argued that, practically, developing a simple and practical model is of greater benefit in assessing the client perceived value in reconstruction projects.

## 5. Discussion

As part of this study, nine out of the 39 client values were identified as the most significant indicators for the nine PMBOK categories. The following describe the nine identified values.

### 5.1 Time: Timeliness

Timeliness refers to the in time delivery of any service during the relationship. Being timely in meeting clients' expectations is what clients expect from any contractual relationship. While in time delivery is a key requirement of any construction contract (Plebankiewicz, 2010; Maloney, 2002), obviously it gains more importance in reconstruction projects which need to be done in an emergency situation (Steinberg, 2007). The research findings indicate that clients explicitly consider the influence of time on their project rather than other terminal values such as price and quality. Timeliness of a post disaster reconstruction project is vitally important for the affected community (Steinberg, 2007; Moloney, 2014; Iwai and Tabuchi, 2013) as its schedule outlines restoration dates, hence, any deviation from the stated schedule causes a quick response from the public.

### 5.2 Cost: To Budget Delivery

To budget delivery refers to the contractual parties' commitment regarding delivery of the project from inception to completion under an estimated price. The importance of "to budget delivery" comes from the complexity and difficulties of reconstruction management, which highlights, for example, the significance of cost management as one of the critical categories of project

management. Post disaster reconstruction projects can experience significant construction cost overrun. Clients' estimating policies require the preparation of 'unlikely to be exceeded but not excessively conservative' estimates (Creedy, 2005). For example, the cost estimation at any stage of a construction project needs to have a 90% confidence factor of the project budget not being exceeded at completion (Creedy, 2005). The study shows that clients value "to budget delivery" over "lower contract price" for post disaster reconstruction. However, lowest contract price is one of the main client values within contractor services in business-as-usual situation and, hence, clients regularly use the lowest price as the award criterion for contracts (Waara and Bröchner, 2006).

### 5.3 Quality: Higher Standard of Quality

Although post disaster reconstruction needs to be completed on time, standard of quality should not be compromised for speed (Grewal, 2006). Low-standard of quality leads to inconsistent quality in reconstruction project (Amaratunga *et al.*, 2009). According to Mannakkara and Wilkinson (2013), although clients require high-quality standards for post disaster reconstruction, a lack of awareness about local guidelines and regulations can lead to inappropriate rebuilt structures. This value criterion is about quality of workmanship, material quality, and technical quality. Poor quality of workmanship contributes to poor structural integrity and low levels of safety (Mannakkara and Wilkinson, 2013). Material quality affects the constructed asset quality and also, in line with quality of workmanship, influences labor productivity (Dai *et al.*, 2007). Constructed asset quality and material quality are determined by technical quality (Ling *et al.*, 2006).

### 5.4 Procurement: Availability of Resources

Resource availability (material, labour, and plant) can be an issue for post disaster reconstruction (Sankaran *et al.*, 2014; Mannakkara and Wilkinson, 2015; Chang *et al.*, 2013) due to the possibility of a sudden surge in demand for technical staff and local materials after a disaster. Inadequate resources have been highlighted by (Chang *et al.*, 2013) as a main construction industry concern after disasters which, according to Lin Moe and Pathranarakul (2006), may result in contractual relationship termination or suspension. For instance, after a disaster the scale of demand for delivery of supplies and logistics expertise, while raising the price can also cause local shortages. Hence, contractors can be incapacitated in terms of delivery of supplies to the point of need. For that reason, reconstruction programmes can be beyond the capacity of local contractors (Ade Bilau and Witt, 2016).

### 5.5 Scope: Competency

Competence of the contractor which is combination of skills, knowledge and experience to deal with post disaster reconstruction complexity and situations is important for achieving client objective. Contractor competency was highlighted as an important value criterion contributing to standard of quality success. Competency can be defined based on two theories (Porter, 1985; Lu *et al.*,

2008). The first theory includes the required strategies that are needed to deal with organizational strengths, weaknesses, opportunities, and threats in the market. The second theory includes skills, knowledge and resources that are needed to gain and maintain a competitive advantage in a contractual relationship. Post disaster reconstruction often fails to achieve its objectives (Lyons, 2009; Ika *et al.*, 2012) due to a lack of appropriate competency in terms of coordination, management (Koria, 2009). Without appropriate competency requirements, accidents occur, costs increase, work quality decreases, and productivity deteriorates. Training for construction sector for improving its resilience (Wilkinson *et al.*, 2016) leads to better competence of the contractors for disaster reconstruction .

### 5.6 Integration: Building a Trust Based Relationship

Trust was identified as a key value for integration within the reconstruction process. In relation to this value, the ranking seems to suggest that building a trust based relationship between parties should not be neglected if mutual benefits for all parties are to be gained, as trusting relationships lead to mutual satisfaction and benefits for a construction project (Park, 2009). Trust is acknowledged as a fundamental value in building better integration (Rahman and Kumaraswamy, 2008) in terms of empowering the parties to take responsibility and commitment for building a successful relationship. Building a trust based relationship between client and contractor prevents adversarial relationships which cause inferior levels of performance (Park, 2009). It would also minimize construction aggravation, disputes and conflict which may occur due to the ambiguous nature of post disaster reconstruction projects.

### 5.7 Risk: Financial Strength and Stability

Several studies (Hatash and Skitmore, 1997; Plebankiewicz, 2010) concerning different subjects such as contractor selection, contractor performance and client satisfaction indicated financial stability as an important factor for project success. In the risk category in this survey, the central role of financial stability during a relationship was stressed by respondents. Poor financial stability is a critical risk factor and can cause severe contractual issues as it can have a serious impact on contractor performance, project schedule, required standard of quality, and so on throughout the life of a relationship. Poor financial stability of the contractor not only affects the project success but also may negatively impact the financial security of the client's organization. This risk factor gains a high level of importance in reconstruction programme where any deviation from the stated programme has significant impact on the public. Therefore, financial stability during a relationship reduces clients' uncertainty or doubt, will improve the clients' feelings of security and enhance the clients' perceptions of the procured service value.

### 5.8 Communication: Communication Technique and Documentation

Communication means keeping contractual parties informed

in language they can understand. Due to the time sensitivity and complexity of post disaster reconstruction projects, appropriate communication skills, techniques and documentation are important (Rapp, 2011). Effective communication has been mentioned as a critical value for developing excellent relationships in any construction contractual relationship (Baiden and Price, 2011; Strategic Forum for Construction, 2013; Love *et al.*, 1998). Communication is linked to team and organisational effectiveness, coordination of tasks and interactions across organisational levels, effective leadership and job satisfaction (Love *et al.*, 1998), while it also plays a critical role in construction project management (Evbomwan and Anumba, 1998). The contractual relationship in reconstruction programme constitutes a multilevel complexity in which client and contractor communicate within categories of networks. The respondents ratings seem to support CBI (2010) perspectives about the value of effective communication. The Confederation of British Industry (CBI), in a recent publication 'Procuring in a downturn', referred to the good dialogue between clients and service providers, as a strategy that will help to maximize the value the clients perceive from their contractual relationships (CBI, 2010).

### 5.9 Human Resources: Productivity

Productivity, broadly, is defined as the ratio of service output to what is required to be provided (I.A, 2015) and, based on this study, is the main indicator of the human resources category. Human resources are deemed important for contractors (Lu *et al.*, 2008), as it is the main source of competitive advantage in construction firms (Sha and Jiang, 2003). However, low levels of productivity can makes it difficult for contractual parties to maintain and improve their competitiveness during a relationship (Sha and Jiang, 2003).

## 6. Conclusions

The development and application of practical assessment tools for evaluation of procured services to provide better service are becoming increasingly popular in the construction industry. However, in the development of such assessment tools, previous research focused on business-as-usual construction rather than post disaster reconstruction. This research addresses this gap. First, this study identified the most important values for clients within contractor services, based on judgment and knowledge of experts in the post disaster reconstruction. Through a survey with experts from leading reconstruction-related organizations, the critical values for the nine PM key objectives of time, cost, quality, integration, scope, human resource, communication, risk, and procurement are identified. Developing appropriate strategies for delivering the identified values will help contractors to provide better value to their client. Second, based on the determined weightings for these values, a CVI was recommended as a starting point for developing a contracting services assessment tool. Such an index could help to quantify client value and help improve client satisfaction in reconstruction projects. Furthermore, assessing

instrumental or intangible aspects of relationships has become of interest in various industries (Jin *et al.*, 2013), through this study its significance has also been recognized in reconstruction following a disaster. For example, the weightings of the values included in the proposed CVI reveals that in a reconstruction situation, clients put more emphasis on instrumental values (intangible aspects of relationships) than cost, which is a key terminal value criterion in business-as-usual construction. While terminal values still remain as clients' core values within contractor services, assessing instrumental values as intangible aspects of client-contractor relationships is also effective in identifying weak areas that hamper the project outcomes. In other words, there is a need for construction participants to make a decision based on a mix of both terminal and instrumental values. Understanding how contractors comply with these values is an important further research area for post disaster reconstruction situation. In, addition future research may investigate how the CVI for post disaster reconstruction is different from the one for the business-as-usual contracting services.

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