Benefits Realization Management Strategies (BRM) For Post-Contract Transaction (PTCS) Minimization in Design-Build (D&B) Projects

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Abstract

There has always been the need to seek out procurement strategies that can achieve and even supersede the planned client's needs and benefits within the construction industry. It is within this context that the Design-Build (D&B) approach is seen to have been initiated to enhance project delivery. It is without doubt that the needs of clients are dynamic which will require contractor team benefits realization management strategies to transform the way the built environment is designed, built and maintained to generate better value. There is a constant need to seek out new techniques and tools to be able to deliver construction projects within the context of developing a sustainable built environment. This paper seeks to establish the benefits realization management strategies for post-contract transaction costs minimization. Questionnaire survey data from a sample of major D&B contractors in Malaysia was analysed using Exploratory Factor Analysis (EFA) in SPSS to establish the specific D&B contractor team benefits realization management strategies. The questionnaire survey was designed based on collation of past literature findings and validated using a Delphi study undertaken with D&B experts. The findings indicate that all the three BRM strategies of D&B contractors' team have a strong and positive significant effect towards minimizing PTCs, even though stakeholder engagement was found to be highly significant with a potential of significant impact in D&B project delivery. It is also evident that D&B contractor team members that are proactive in managing changes are likely to perform optimally and minimize PTCs during the delivery process. The finding also shows that, the team ability to envisage potential disbenefits is critical to the success of PTCs minimization, as well as being engaged throughout the entire process of the delivery. It is also clear that contractor team should ensure outcomes are related to strategic objectives of the project or client requirements based on the requirement capture at the design brief stage.

Keywords: Design-Build (D&B), Benefits Realization Management (BRM), Post-Contract Transaction Costs

INTRODUCTION

The benefits realization approach has emerged information organizations and engineering sector during the 1990's. It was triggered by the low success of technology implementation in generating the anticipated business benefits of organization (Thorp, 1998). It is found in the literature that the necessity for managing benefits realization is based on three premises: (i) benefits do not automatically appear when a project is delivered; (ii) benefits rarely happen according to plan; and (iii) realizing benefits is a continuous process of envisioning results, implementing, checking intermediate results and dynamically adjusting the path leading from investment to investment to business outcomes.

However, one essential aspect of the benefits realization approach is to upsurge the predictability of benefits through visualizing the different possible paths from actions to results and to the generation of benefits, whilst constantly assessing the flow (Remenyi & Sherwood-Smith, 1998). On the other hand, stakeholder's commitment in a benefits realization approach is essential (Bradley, 2006). Bradley states that success is very likely when stakeholders are engaged in articulating the vision or at least influencing the shape of the change, and where value can be seen clearly, either for themselves or for the whole organization. It is also found in the literature as posited by Christoffersen & Emmit (2009) that the significance of engaging different stakeholders to deliberate on project values has also been explored in construction industry through the application of a value-based approach to design management.

Benefits realization literature emphasizes the understanding of projects as systems in which collectively identify the inter-relationships between projects and benefits are crucial (Reiss *et al.,* 2006). Mapping benefits make clear the path to benefits realization, the dependencies between projects, deliverables and benefits, as well as the distribution of budget and responsibilities. As a result, it allows basis for risk management, budgetary control and monitoring (Reiss *et al.,* 2006). Continuous improvement is also stressed based on cyclic assessments to enable learning and adaptation (Farbey *et al.,* 1999a). The implication of considering continuous re-evaluation of project means, ends and constraints is also discussed by Ballard (2008) and Howell *et al.* (1993).

Different challenges identified in the benefits realization literature are: (i) the ability of setting the adequate measurements to track benefits realization, since it is difficult to convert a policy vision or a business strategy into detailed and measurable statements (Bradley, 2006); (ii) the fact that some of the benefits may be secondary, non-expected and a result of changes that were made during implementation (Farbey *et al.,* 1999b); and (iii) after the project has been delivered, generally the team is dispersed representing a difficulty to set responsibility for the accountability of benefits. In view of the literature review, this research presents an initial understanding, and as proposed by Rooke *et al.* (2010), additionally for the need of a new and more effective benefits realization and management process that embodies and operationalize the concepts and issues presented in this section. Sapountzis (2013) identify three major dimensions or strategies in which the issues for considering a benefits realization are based. The strategies are: Proactive management and learning; Stakeholder engagement; Strategy deployment.

The stakeholders in construction industry has always seek out procurement strategies and project delivery mechanisms that can achieve and even supersede the planned client's needs and benefits. It is within this context that the Design-Build (D&B) approach is seen to have been initiated within the construction industry. The construction industry needs to innovate in order to keep pace with the changes that the world is constantly facing. In addition to responding to the pressing social, economic and technological challenges affecting all industries today, it cannot be denied that the opportunities and problems facing construction in the future will be very different from those of today. It is without doubt that the needs of society and demands of clients will not remain stagnant - requiring greater contractor team commitment to transform the way the built environment is designed, built and maintained to generate better value. Thus, there is a constant need to seek out new techniques and tools to be able to deliver construction projects within the context of developing a sustainable built environment.

In Malaysia, not all the D&B projects were successfully delivered as designed and planned. The D&B concept has been labeled to be 'designed to fail' by the then Malaysian Second Finance Minister as reported by the New Sunday Times, February 4, 2007. This is due to the fact that, some of the D&B mega projects have failed to effectively deliver benefits as to client's requirements (Jasri, 2011). It is noted by Gambo & Gomez (2015); Abdul Rahman *et al.* (2006); Seng & Yusof (2006); Isa *et al.* (2011); and Hashim *et al.* (2006) that clients' expectations in the D&B delivery system are not adequately met and the system is not being practiced in the manner that is meant to leverage on its potential benefits in the Malaysian construction industry. It is identified in the literature that a constraint such as lack of management expertise is also a contributor to D&B project failure. Another key problem identified is Transaction costs; These post-contract TCs could be high arising from disputes and litigation, as conflict and disputes are deemed to occur in the construction industries of many countries (including Australia, USA, UK, Hong Kong, New Zealand and Nigeria) and inflict a high cost to the industry both in terms of direct and indirect costs. It is found that the post-contract TCs for D&B range from 3.4% to 14.7% with an average of 9.5% of the overall project value (Rajeh, 2014; Li *et al.*, 2015). In Malaysia, the situation is not different with an average of 7% ranging from 3.5% to 13.5% of the project value based on the pilot study conducted as part of this research.

It is within the context of the issues related to project performance with respect to minimizing post-contract transaction costs (PTCs) of current D&B projects, that the benefits realization management strategies of the contractors' team is being brought to question in relation to whether clients are getting value maximization in D&B projects. In this research D&B contractors' team benefits realization management strategies are hypothesized as potential operational approaches towards optimizing benefits delivery through the engagement of a competent project team right from the onset of the project. Hence, this research seeks to establish BRM strategies that minimize PTCs in D&B delivery system.

Benefits realization management strategies

Sapountzis *et al*. (2009) and Ward *et al.* (2006) define a benefit as an advantage on behalf of a particular stakeholder or group of stakeholders. On the other hand, Wiinberg (2010) states that the process to achieve competitive and financial benefits is called benefit realization management. Similarly, benefits realization management (BRM) has been defined as 'the process of organizing and managing the potential benefits arising are actually realized' (Bradley, 2006). Reiss *et al.* (2006) defined benefits realization management as the process for the optimization of benefits from a program's change perspective. Nevertheless, the concept of benefits realization is not new (Simon, 2003, in Nogeste & Walker, 2008) and neither is the awareness and identification of the links between project and benefits realization management as evidenced in extant literature. According to Farbey *et al.* (1999) benefits realization management is the process that realizes the benefits that are achieved and manages the unexpected ones. *The benefits realization literature emphasizes the understanding of projects as systems which collectively identify the inter-relationships between projects and benefits as essentials* (Reiss *et al.*, 2006). BRM seeks to increase the predictability of realizing maximum benefits for all stakeholders in a project through the utilization of a robust benefits realization process (Harris *et al.*, 2008). It is to be noted that only few scholars have published literature on the subject of benefits realization with regards to the construction industry, most of the work is related to the IT industry.

The measurement scale of benefits realization management (BRM) strategies used for this research was adopted from Sapountzis (2013). Sapountzis (2013) conceptualized BRM strategies into three dimensions: proactive management and learning strategy, stakeholder engagement strategy and strategy deployment (see, Table below).

In this study, BRM strategies are operationalized from the previous studies of Sapountzis (2008, 2009 and 2013). The focus is on D&B contractor`s team-competency towards optimal benefits realization in D&B delivery system. Hence, the three BRM variables namely: proactive management and learning, stakeholder engagement and strategy deployment with fifteen items were developed to assess BRM strategy in D&B towards optimal benefits realization. Finally, this study considers BRM strategy as a second order formative construct.

Table 1: Measurement of benefits realization management constructs

Construct	Definition	Measures	Sources
Proactive Management & Learning	Is the ability of an individual or stakeholders to change how they think, manage and act	• Search opportunities to minimize transaction costs • Proactively manage changes • Review and feed-back • Review and feed-forward • continuously review	Sapountzis (2013)
Stakeholder Engagement	Stakeholder engagement is an important issue when considering a benefits realization approach. Stakeholders are individuals and groups that have an interest and can influence the actions of an organization	• Clearly define benefits at the outset. • Committed to minimizing transaction costs. • Challenges • Engaged throughout the entire process.	Remenyi & Sherwood-Smith, (1998) Ward & Daniel, (1996) OGC (2007) Glynne, (2007)
Strategy Deployment	This strategy requires a direct and continuous focus on project benefits realization. This phase includes the evaluation and controlling of benefits.	• Ensure outcomes relates to client requirements. • Drive process based on measurements. • Track and report realization of benefits. • Translate objectives into measurable benefits. • Measure things that really count. • Ensure the path from investment to benefits delivery is effectively planned.	Sapountzis et al (2009) Thorp (2003) Ashurst & Doherty (2003)

A) *Proactive Management*

Proactive management is the ability of an individual or stakeholders to change how they think, manage and act (Thorp, 2003; Sapountzis, 2013). Stakeholders search for opportunities to maximize benefits and proactively manage the emergence of unplanned benefits. To operationalize

and measure proactive management strategy, this study adopts construct measures from Sapountzis (2013). The final five items were developed to assess benefits realization management (BRM) towards optimal benefits realization and project performance. The final five items for proactive management and learning strategy are shown in the next paragraph. Hence, this study considers proactive management and learning strategy as a first order reflective construct.

Items used for measuring proactive management & learning include but not limited to the following: a) As part of the contractor team we search for opportunities to minimize transaction costs. b) As part of the contractor team we proactively manage changes. c) As part of the contractor team we review and evaluate performance and feed-back into the process. d) As part of the contractor team we review and evaluate performance and feed-forward into next process, and e) As part of the contractor team we continuously review the list of expected benefits to check strategic fit (Sapountzis, 2013).

B) *Stakeholder Engagement*

Stakeholder engagement is an important issue when considering a benefits realization approach. Stakeholders are individuals and groups that have an interest and can influence the actions of an organization (Tillmann, Tzortzopoulos, & Formoso, 2010). It is also noted by Savage *et al.* (1991), that stakeholders are individuals and groups that have an interest and can influence the actions of an organization. Stakeholders are presumed to be engaged throughout the entire process and also to have clearly defined benefits at the project outset. To operationalize and measure stakeholder engagement strategy, this study adopts construct measures from Sapountzis (2013). The final four items were developed to assess benefits realization management (BRM) towards optimal benefits realization. The final four items for stakeholder engagement strategy are presented below. This study considers stakeholder strategy as a first order reflective construct.

Items used for measuring stakeholder engagement are as follows:

a) As part of the contractor team we clearly define benefits at the outset, b) As part of the contractor team we are committed in minimizing transaction costs, c) Challenges: As part of the contractor team we are aware of disbenefits, and d) As part of the contractor team we are engaged throughout the entire process (Sapountzis, 2013).

C) *Strategy Deployment*

Strategy requires a direct and continuous focus on project benefits realization. This phase includes the evaluation and controlling of benefits (Sapountzis, 2008). The emphasis on continuity within the benefits management process almost certainly lasts beyond the closure of the project or handover (Ohene-Addae, 2013; Sapountzis, 2013). In order to operationalize and measure strategy deployment, this study adopts construct measures from Sapountzis (2013). The final four items were developed to assess benefits realization management (BRM) towards optimal benefits realization. The final six items for strategy deployment are shown below. Hence, this study considers strategy deployment as a first order reflective construct.

The items used for measuring strategy deployment are: a) As part of the contractor team we ensure outcomes are related to strategic (client requirements) objectives, b) As part of the contractor team we drive the process based on measurements, c) As part of the contractor team we track and report realization of benefits and other achievements as well as minimize

transaction costs, d) As part of the contractor team we translate objectives into measurable benefits that can be tracked, e) As part of the contractor team we measure things that really count, and f) As part of the contractor team we ensure the path from investment to benefits delivery is effectively planned (Sapountzis, 2013).

In summary, all constructs adopted in this research were reviewed and validated by the Delphi panel of experts. The constructs were also subjected to an internal reliability analysis based on the pilot test. The reliability represented by Cronbach`s Alpha of all constructs were reported to be above 0.7 which indicated an acceptable internal reliability.

METHODOLOGY

The population of study consisted of 4,625 G7 contractors (highest grade of registered contractors, eligible to bid for value of work above RM10 million) registered with CIDB Malaysia based on the CIDB website directory as of December 2015. Based on Saunders et al. (2015) sampling table, 357 G7 contractors were selected with 3% margins of error and 95% confidence level. Structural Equation Modelling (SEM) using SmartPLS (3) was used for the data analysis. A total of 248 questionnaires were returned with 17 considered as invalid. The collected data was tested for missing data and Monotone Response Pattern. The data from the 231 questionnaires was analyzed using SPSS version 21.

RESULTS AND DISCUSSION

The Principal Components Analysis (PCA) in SPSS was used to extract the 12 D&B contractor team BRM strategies. Prior to performing PCA, the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.4 and above. As shown in the KMO and Bartlett's Test table below, the Kaiser-Meyer-Olkin value is .858, exceeding the recommended value of 0.6 (Tabachnick & Fidell, 2018; Aldrich, 2019) and Bartlett's Test of Sphericity reaches statistical significance (Sig. value .05 or smaller), supporting the factorability of the correlation matrix (Hair et al., 2018).

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.858
Bartlett's Test of Sphericity	Approx. Chi-Square	2157.987
	df	66
	Sig.	.000

Furthermore, based on the analysis, Varimax method of orthogonal approach was adopted for the factor rotation. Orthogonal approach indicates that all components are assumed to be uncorrelated (Bordens & Abbott, 2018; Aldrich, 2019). Varimax rotation method is the most commonly used method which attempts to minimise the number of variables that have high loadings on each other (Pallant, 2016). Based on this analysis, rotation converged in 10 iterations. PCA revealed the presence of 3 components with eigenvalues exceeding 1, explaining 75.3% of total variance. The percentage of variance for each retained component and its eigenvalue are included in Table 3. Retaining components with eigenvalues of 1 or greater is the most commonly used rule. According to Hinton, McMurray, and Brownlow (2014), "an eigenvalue of 1 indicates that the factor can explain as much variability in the data as a single original variable." There is no threshold for the minimum percentage of total variance explained however, Hair et al. (2018) mentioned that 60% is satisfactory. The rotated component matrix table was generated in SPSS and decision with

respect to the number of components to be extracted was made. All principles loaded on all 3 components (Refer to Table 3) even though, there were cases of cross loading, in which some were retained (if the difference is <0.2) and those above (if the difference is >0.2) were removed.

Table 3: Result of factor analysis

Components	Eigen value	% of Variance	[a]Name of components	[b]Commitment	Factor loading
1	2.751	68.783	Proactive Management and Learning	PML01	0.836
				PML02	0.720
				PML04	0.922
				PML05	0.827
2	2.429	80.971	Stakeholder Engagement	SE02	0.910
				SE03	0.910
				SE04	0.880
3	3.364	67.281	Strategy Deployment	SD01	0.850
				SD02	0.823
				SD03	0.786
				SD04	0.820
				SD05	0.820

[a]Components were named based on extraction and characteristics of the group
[b]The meaning of PML, SE, SD is presented in the list above.

A 3-component BRM strategies was established based on Varimax rotation of principal component analysis (see, Table 3). These 3 factor groupings with eigenvalues greater than 1.000 explain 60% of the variance. Each of the BRM strategies items belonged to only one of the groupings, with the value of factor loading exceeding 0.50 (Aksorn and Hadikusumo 2008).

Component 1: *Proactive Management and Learning*

This component, which accounted for 68.78% (see, Table 3) of the total variances between BRM strategies, was adequate in percentage variance, as it has surpassed the recommended threshold of 60%. It indicated that D&B contractor team in Malaysia need to consider proactive management and learning significant in D&B project delivery process. To enhance the understanding of D&B contractor team, their BRM strategies and potential influence need to be established. Therefore, this component, which relates to BRM, is described as the contractor team being *able to search for opportunities to minimize transaction costs; proactively manage changes; review and evaluate performance of D&B project and feed forward into next process; as well as continuous review of the list of expected benefits to check strategic fit* as represented by PML01-PML05.

Component 2: *Stakeholder Engagement*

This component, which accounted for 80.97% (see, Table 3) of the total variances between BRM strategies, was seen as highly significant based on the analysis. It indicated that D&B contractor team in Malaysia consider stakeholder engagement significant in D&B project delivery process. Key stakeholder engagement factors such as *commitment to minimize transaction costs; being aware of potential disbenefits; engaging stakeholders and team members throughout the entire process* of the project delivery.

Component 3: *Strategy Deployment*

The third component, account for 67.28% (see, Table 3) of the total variances between BRM strategies, was seen as highly significant based on the analysis. It indicated that D&B contractor team in Malaysia consider strategy deployment significant in D&B project delivery process. Key strategy deployment factors such as contractor team ensuring that outcomes are related to strategic objectives of the project vis-a-vis client requirements; the need to drive the process based on measurements. On the other hand, track and report realization of benefits and other achievements as well as minimize transaction costs. In addition, the team translate objectives into measurable benefits that can be tracked throughout the project delivery.

CONCLUSION

Based on the finding of this research it is clear that, D&B contractor team benefits realization management strategies is an important as for minimizing PTCs and enhance project performance. The findings indicate that all the three BRM strategies of D&B contractors' team have a strong and positive significant effect towards minimizing PTCs, even though stakeholder engagement was found to be highly significant with a potential of significant impact in D&B project delivery. It is also evident that D&B contractor team members that are proactive in managing changes are likely to perform optimally and minimize PTCs during the delivery process. The finding also shows that, the team ability to envisage potential disbenefits is critical to the success of PTCs minimization, as well as being engaged throughout the entire process of the delivery. It is also clear that contractor team should ensure outcomes are related to strategic objectives of the project or client requirements based on the requirement capture at the design brief stage. It is proposed that in order to minimize PTCs effectively, proactive management and learning, stakeholder engagement and strategy deployment strategies of D&B contractor team members need to be given due consideration for D&B to thrive successfully.

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