THE CONSTRUCTION CLIENT SATISFACTION MODEL: A PLS-SEM APPROACH

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Abstract. The satisfaction of the client is of utmost importance in procuring future projects; however, anecdotally client satisfaction (CS) is not adequately considered in many developing countries. Factors associated with the influence of service quality (SQ) on construction client satisfaction and how it affects their behavioural intentions in Cambodia are investigated. A theoretical structural model was developed to investigate the influence of five SQ factors on CS and their links to the future behavioural intentions of the client. A partial least square approach of the structural equation modelling technique (PLS-SEM) was employed to analyse data collected from a questionnaire survey of 227 participants comprising the clients of small and medium size projects. The structural model adapts 22 attributes across five SQ factors, namely: reliability; responsiveness; assurance; empathy, and tangible factors. PLS-SEM outcomes confirmed that the future behavioural intentions of the client are influenced by their satisfaction over the service excellence provided by construction companies. Moreover, treating every client individually and demonstrating an approachable attitude towards their needs will increase their satisfaction with the experience they had with a contractor. Findings and recommendations of the study may be useful to construction companies who are seeking ways to improve CS in developing countries.

Keywords: client satisfaction, service quality, PLS-SEM, construction, Cambodia.

Introduction

Having an annual contribution of 9–10% to the country's Gross Domestic Product (GDP) makes the construction and real estate industry the second most important driver of Cambodian economic growth (MEF 2016). For instance, residential project approvals have accelerated to reach US$8.5 billion in 2016, compared with US$3.3 billion in 2015 (Durdyev, Mbachu 2017). It seems that investors' (especially overseas) appetite remains strong, which has made the construction industry in Cambodia an industry in transition, mainly in the last decade. Domestic construction companies are facing stiff competition as the market has been attracting global players, the vast majority of whom are from China, Singapore, South Korea, Thailand, Indonesia and Malaysia (Yonn 2017). In order to survive in this competitive business environment, substantial research efforts in the construction industry context of Cambodia are underway, which include automation for construction activities, prefabrication and application of building information modelling for efficient design and management of projects. The significance of these areas cannot be understated as each of them represents a facet of the construction business, which requires proper attention (Lessing *et al.* 2017).

Having a variety of investors from different countries – from the investor's perspective – shows the potential of the sector, as well as its level of competitiveness. Therefore, construction companies develop different strategies (as do investors) to win construction project bids and those who are currently operating try to keep client satisfaction at the highest level to procure future projects in the country (Durdyev *et al.* 2013). Thus, client satisfaction in the Cambodian construction industry is of strategic importance, as the most effective way of marketing in the country is through word of mouth.

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Obtaining new work and ensuring project delivery on schedule, within budget, and meeting quality standards are just a few of the many services of a construction company (Durdyev, Ismail 2016). Operations and maintenance, training in complex building systems, financial engineering and facility management are some of the services required of construction companies. Along with the project cost, schedule and quality, construction client satisfaction is one of the significant elements measuring the success of any contractor in the construction industry (Othman 2015). Even though it is mostly applied in other industries, the adoption of the service quality and client satisfaction approach for companies offering design and build services is vital for better differentiation between competitors (Preece, Tarawneh 1997). What differentiates leading construction companies from others is service excellence, which improves productivity, maintains client loyalty, and creates positive word-of-mouth advertising, all of which can create advantages in the competitive business environment. Due to its significance, client satisfaction has received broad attention in the literature (Barret 2000; Torbica, Stroh 2001; Maloney 2002; Yasamis *et al.* 2002; Yang, Peng 2008; Kärnä *et al.* 2009; Li *et al.* 2013; Hsu, Juan 2016; Aliakbarlou *et al.* 2017; Hadidi *et al.* 2017). For example, construction client satisfaction was perceived to be the most significant determinant of success in the Turkish construction industry context (Arslan, Kivrak 2009). In another study, Foster and Ganguly (2013) measured clients' satisfaction though the identification of gaps between their expectations and satisfaction of those expectations, where they mainly focused on the following five dimensions of service quality: 1) tangibles; 2) reliability; 3) responsiveness; 4) assurance, and 5) empathy. However, Forsythe (2015) gave priority to two of the aforementioned dimensions, which are reliability and tangibles. It is recommended that construction companies should formulate the satisfaction criteria for each project and client, rather than trying to produce a standardized list of quality criteria, which is not possible (Maloney 2002). Thus, studies from other countries and projects may not be entirely applicable in the Cambodian construction industry, as perceived service quality and client satisfaction are industry specific, due to the differences in the socio-cultural, legislative and regulatory environments within which construction operations are undertaken. Moreover, no notable research or industry initiatives had been undertaken in Cambodia until the commencement of this scoping study. Therefore, using the structural equation modelling (SEM) method, this study aims to investigate the influence of contractors' service quality on construction client satisfaction in the Cambodian construction industry. To achieve this aim, this study was undertaken with the following objectives:

- to identify the service quality components of the construction industry context;
- to develop a structural equation model (SEM) and use it to quantify the relationships between service quality and client satisfaction in the Cambodian construction industry.

The remainder of this paper is structured as follows. The next section presents a review of the literature on service quality and client satisfaction in the construction context. In the second section, the theoretical framework of study is presented. In the third section, the techniques applied (i.e., SERVQUAL and Partial Least Square Structural Equation Modelling) are presented. Section four describes the results. The last section discusses the framework's implications for research and industry, limitations, its practical validation, as well as offers concluding remarks.

1. Literature review

Quality has become such a buzzword for the improvement of any business for a long time and therefore, one of the most frequently researched topics (Womack *et al.* 2008; Forsythe 2015; Ferreira *et al.* 2017; Osei-Kyei *et al.* 2017). From the service industry perspective, receiving more attention (quality of service) increases customers' satisfaction, subsequently strengthening bonds (loyalty) between them and a company (Nadiri, Gunay 2013), which may lead to them recommending that company to others (Wu, Liang 2009), which ultimately will reflect on profitability. Service quality has also been regarded as a true reflection of the manufacturing/production success of any business, as investing more resources and efforts towards increasing the quality of a product yields increased annual income (Fajgelbaum *et al.* 2011). Emphasising the significance of customer satisfaction, Kotler and Armstrong (2013) describe business success as a factor in achieving client satisfaction, which contributes to expansion of market share, thereby increasing profits via repeat sales, and enhancing long-term customer ethical standards (i.e. equity). Furthermore, Oliver and Linda (1981) asserted that improvement in client satisfaction is a key to survival in a competitive business environment.

Customers' perceptions towards their choice of, and level of satisfaction with, the product will eventually have a positive influence on their future intentions (Ihtiyar, Ahmad 2014). However, in recent years, quality perception has shifted from a merely product-centric to client-centric quality, which is also referred to as a client satisfaction (Sheth *et al.* 2011). For instance, Vargo and Lusch (2004) proposed a logic whereby products are a simple service delivery vehicle to achieve client-specific needs at the highest level of expectation. Thus, customers' perceived value of quality depends on the level of service provided; instead of the quality level of product they purchase (Vandermerwe 1994).

Service quality based on customer perception has received broad attention by researchers in the construction management context (Lee, Yu 2012), even though it has been traditionally associated with service industries, within which construction is not usually grouped. Hadidi *et al.* (2017) undertook a study focusing on the design services for large scale projects and recommended implementation of quality management systems (QMS) for better construction clients' satisfaction. However, rather than

simply implementing costly QMSs, they further stressed the validation of systems' effectiveness. Furthermore, from the contractor's perspective, Zulu and Chileshe (2010) investigated the level of service quality required of building maintenance contractors in Zambia and further stressed the importance of responsiveness of contractors towards the construction clients' needs.

Mainly from construction clients' perspectives, Sunindijo *et al.* (2014) established relationships between four dimensions of service quality. Using structural equation modelling, reliability, responsiveness and assurance were found to be significantly influencing dimensions, while tangibles (such as documentation quality, and quality of the workforce) was less influential on construction client satisfaction. Consequently, contractors were further recommended to address – after project completion – the factors both negatively and positively affecting construction client satisfaction as lessons learned for future projects. By focusing on construction clients' perceptions of a specific market setting, Forsythe (2016) developed a conceptual approach to understand the dynamic influence of service quality on client satisfaction, as well as identifying contextual variables that have an influence on the relationships within the residential construction industry in the UK.

Notwithstanding the extensive extant literature concerning the elements of service quality and client satisfaction in the construction context, daily dynamic changes in the construction operation services have yet to receive much attention. Moreover, due to cultural context of Cambodian construction industry, there are parameters influencing service quality and client satisfaction. For instance, lack of skilled workforce (Durdyev *et al.* 2017a), frequent project delays (Durdyev *et al.* 2017b) and lack of quality standards are the most critical factors affecting the level of satisfaction. Therefore, authors have included the following factors (ASU2, ASU3, RLB2, RLB4, EMP2, TNG2), which thought to be significant due to cultural context of the industry in Cambodia. Table 1 depicts service quality components within the construction industry context with a robust backing in the literature, which therefore provides a basis for achievement of the first objective of the study. Furthermore, regardless of the similarities between projects, every one of them (due to their uniqueness) and every client should be treated separately. Thus, instead of merely focusing on several indicators of dissatisfaction, the focus of this study is to examine the influence of service quality constructs on construction client satisfaction, and its total impact on behavioural intention in the Cambodian construction industry context. Due to its unique features, structural equation modelling, as a robust analysis technique (Byrne 2009), was used to estimate a quantitative inter-dependent relationship between independent variables in this study (Durdyev *et al.* 2017c).

2. Theoretical framework

Review of the relevant literature (refer to Table 1) on the subject suggests various components of service quality (SQ) that affect client satisfaction (CS) in the construction industry context. These components can be grouped into five general categories: reliability (RLB); responsiveness (RES); assurance (ASU); empathy (EMP), and tangibles (TNG). Furthermore, behaviour intention (BI) has a positive influence on customer satisfaction. Hence,
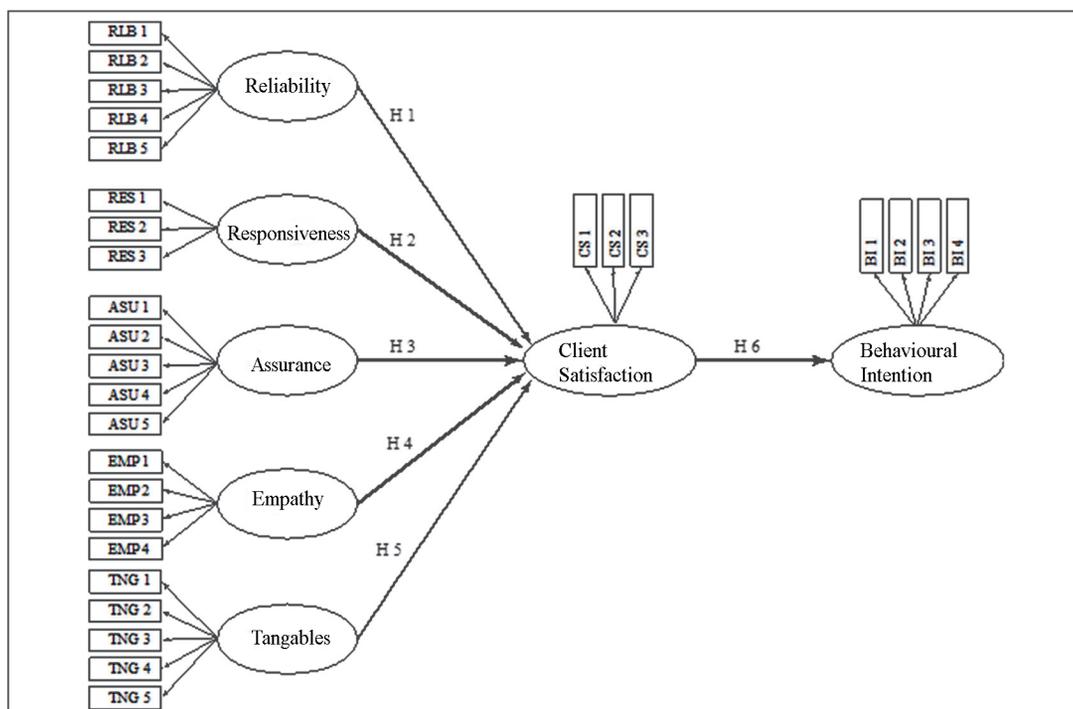

Figure 1. Research framework of the study

Table 1. Items used for questionnaire design

Item code	Item	Reference
	Reliability	
RLB1	Provision of services as promised	Kang and James (2004)
RLB2	Display a helpful attitude in solving problems	Ahmed and Kangari (1995)
RLB3	Work order performed as it is required	Sunindijo *et al.* (2014)
RLB4	Provision of services at the promised time	Abdullah *et al.* (2014)
RLB5	Report periodic/continuous work progress	Ahmed and Kangari (1995)
	Responsiveness	
RES1	Keeping clients informed of the time when the service will be performed	Sunindijo *et al.* (2014)
RES2	Providing immediate service to clients	Eager *et al.* (2001)
RES3	Willing to help clients	Kang and James (2004)
	Assurance	
ASU1	Employees who instil confidence in clients	Kang and James (2004)
ASU2	Assuring the quality of work is up to standard	Durdyev *et al.* (2014)
ASU3	Displaying courtesy consistently	Ahmed and Kangari (1995)
ASU4	Having sufficient knowledge to answer client's questions	Sunindijo *et al.* (2014)
ASU5	Being competent in problem solving	Sunindijo *et al.* (2014)
	Empathy	
EMP1	Understanding client-specific needs	Kang and James (2004)
EMP2	Offer personalized attention to clients	Vera and Trujillo (2013)
EMP3	Post-project maintenance service	Sunindijo *et al.* (2014)
EMP4	Business hours convenient for client	Kang and James (2004)
	Tangibles	
TNG1	Sufficient number of latest tools and equipment in good condition	Kang and James (2004)
TNG2	Sufficient workforce to complete a project	Durdyev and Mbachu (2011)
TNG3	Sufficient storing facility and good housekeeping	Sunindijo *et al.* (2014)
TNG4	Proper dress code for workforce complying with code of conduct	Kang and James (2004)
TNG5	Detailed documentation	Ahmed and Kangari (1995)
	Construction client satisfaction	
CS1	I am satisfied with the service provided by the contractor	Kang and James (2004)
CS2	I am satisfied that I chose this contractor wisely	Kang and James (2004)
CS3	I had a great experience using this contractor	Kang and James (2004)
	Behavioural intention	
BI1	Will you be recommending this contractor to other people in the future?	Sunindijo *et al.* (2014)
BI2	If you have the opportunity to use the same contractor in future, would you?	Sunindijo *et al.* (2014)
BI3	Will you be waiting for the same contractor in case of unavailability?	Sunindijo *et al.* (2014)
BI4	How likely is it that you are willing to pay premium price to hire the contractor?	Sunindijo *et al.* (2014)

the latent dimensions (along with the key associated attributes) further provide a theoretical basis to construct the research framework of the study depicted by Figure 1, where an arrow shows the direction of influence in the hypothesized structural model. Moreover, based on the above-mentioned theoretical framework, the following statements were hypothesized for this research:

H1: Reliability has a positive influence on construction client satisfaction;

H2: Responsiveness has a positive influence on construction client satisfaction;

H3: Assurance has a positive influence on construction client satisfaction;

H4: Empathy has a positive influence on construction client satisfaction;

H5: Tangibles have a positive influence on construction client satisfaction;

H6: Customer satisfaction has a positive influence on behaviour intention.

3. Research method

To provide an empirical assessment of the proposed research model shown in Figure 1, this study adopts a quantitative technique using a cross-sectional data collection approach. Due to time limitations, reduction of cost, increased ease of distribution, improved data accuracy and difficulties in data collection, a questionnaire survey methodology was used as the main source of the primary data (Durdyev *et al.* 2017d; Taleb *et al.* 2017). To assure consistency with the aim of the study, the SERVQUAL service quality scale measures (Parasuraman *et al.* 1988) were used to design the questionnaire survey. Additionally, the measures for customer satisfaction and behavioural intention are adopted mainly from the relevant literature depicted by Table 1.

The scale quantifies the difference between client's expectation (desired level) and recent performance (perceived level) based on 22 measures across five broad categories, namely reliability, responsiveness, assurance, empathy and tangibles. A service receives an excellent rating if recent performance is higher than expectation; it is satisfied if there is no difference; and dissatisfied if performance is not at the same level with expectation (Vesel, Zabkar 2009).

Measuring service quality by means of the SERVQUAL has received broad attention from various service sectors. While Padma *et al.* (2010) measured service quality (SQ) in the health care sector, Cameran *et al.* (2010), Kettinger *et al.* (2009), Jani and Han (2008) and Ban *et al.* (2016) quantified SQ of professional services, information systems and the tourism sector, respectively. Furthermore, Trivellas and Dargenidou (2009) measured the SQ of the education sector, Amin and Isa (2008) of banking services, and Vesel and Zabkar (2009) of the retail sector. However, several studies have criticized the scale (Caro, Garcia 2007; Das *et al.* 2010; Ihtiyar, Ahmad 2012) and further modification and customization have been suggested, such as specifying the industry-specific features, in particular. In an early study from the clients' perspective, Wall and Payne (1973) criticised the scale due the apparent difference between client's expectation and service performance. Babakus and Boller (1992) found that the SQ score relies more on perception compared to expectation. Further, Brandon-Jones and Silvestro (2010) stressed the influence of confusion and apathy on the data quality due to the realisation of expectation and perception measures of the scale.

Notwithstanding the criticisms of the scale, there is a sufficient amount of studies suggesting that the SERVQUAL should be the basis for measuring service quality. Thus, this study aims to test whether the proposed model can conceptualise and explain the endogenous and exogenous variables using the SERVQUAL service quality measures adopted from the relevant literature on the subject, but with some modification to specify industry-specific features (refer to Table 1).

A convenience sample of experts (three construction clients and two consultants with relevant experience in client management) agreed to devote their time to participate in in-depth, face-to-face interviews, in order to validate the relevance of the items in the questionnaire, which were mainly sourced from Ahmed and Kangari (1995), Kang and James (2004) and Sunindijo *et al.* (2014). Thus, an open-ended questionnaire was designed to collect quantitative data as a part of the second stage of the paper. The questionnaire comprised two sections, where the first part investigates the demographic background of the respondents and the second part allows for further quantification of the relationships among service quality, client satisfaction and behavioural intention, which will eventually help to develop a structural equation model (second objective of the study). It is obvious that commercial projects will invest more resources and effort into achieving as high a service quality level as possible, which it is hypothesized will affect the client's behavioural intention, while the significant criteria for contractor qualification for public projects, due to limited budgets, is a project cost. Therefore, clients or client representatives of private projects in Cambodia were selected as potential respondents for this study. Construction clients of small and medium size projects in Phnom Penh were the targeted population as they form the vast majority of construction projects in Cambodia.

Structural equation modelling (SEM). Following the data collection stage, selecting an appropriate statistical analysis technique remains a challenge (Sarstedt *et al.* 2014). In this regard, this study utilises a Structural Equation Model (SEM) to quantify the relationships between service quality, construction client satisfaction, and their behavioural intentions in the Cambodian construction industry.

SEM is an appropriate and flexible technique to simultaneously assess constructs of the model and the hypothesised structural relations among variables via a measurement model and structural model analysis (Hair *et al.* 2013; Zhang *et al.* 2017). SEM method has been used in various studies around the world in several different industries like tourism and the hospitality industry service and manufacturing industries, transportation industry, construction industry, firms, universities and other industries and sectors (Mardani *et al.* 2017). However, due to the principal statistical assumptions and nature of fit statistics, there are two SEM approaches, namely the component-based approach (i.e. partial least square) and the co-variance-based approach (CB-SEM) (Hair *et al.* 2013). While CB-SEM reduces the differences between the sample co-variance and the predicted model by maximum likelihood function (Urbach, Ahlemann 2010), partial least square (PLS-SEM) maximises the co-variance score between dependent and predictor latent variables (Hair *et al.* 2013). Moreover, PLS-SEM provides estimation on single and multi-component models and canonical correlation (Hair *et al.* 2013). Instead of using the maximum likeli-

hood (ML) estimation procedure, PLS-SEM is a regression analysis technique based on ordinary least squares (OLS), which aims to maximise the R2 values of the endogenous constructs (Hair *et al.* 2013).

Many studies recommend the utilisation of PLS-SEM (Henseler *et al.* 2009; Soto-Acosta *et al.* 2016) despite its drawback, particularly the procedure for examination of data (Rouse, Corbitt 2008). For instance, Wong (2013) claims that the PLS-SEM is the more proper tool for distribution of data and sample size, which compared to the CB-SEM does not require a large sample size and normal distribution. PLS-SEM can also be utilised for the model that comprises both reflective and formative constructs simultaneously (Hair *et al.* 2013). On the other hand, CB-SEM is extremely sensitive to data normality, inter-dependence of observation, large sample size, and uniformity of variable metrics (Sosik *et al.* 2009). Problematic explanation of co-variance of all indicators is another reason for CB-SEM being an inappropriate technique for formative constructs (Henseler *et al.* 2009). Thus, this study applies PLS-SEM to construct the relationships between latent variables via SmartPLS software 3.0, which provides substantive statements about the relationship among latent variables.

4. Results

4.1. Data demographics

Following the pilot study, the main study proceeded with the actual data collection. The questionnaires were administered to construction clients or client representatives of private projects in Cambodia. Domestic construction clients of small and medium size projects in Phnom Penh were the targeted population as it is home to the majority of construction projects in the country. The data collection period for the study was between February and June 2017. Of 300 distributed questionnaires, 227 valid questionnaires were received by the cut-off date, which represents a response rate of about 77%, with the rest of the survey responses being invalid or missing. While the sample size for the SEM methodology should be sufficiently large, there is a deficiency in the extant literature, which has a lack of clear consensus on required sample size. Thus, the response rate for this research satisfied the sample size requirements suggested by Doloi *et al.* (2011).

4.2. Data analysis

4.2.1. Missing value treatment

Missing values are a common problem in questionnaire survey based studies, which leads to difficulties in the multivariate data analyses in behavioural and social sciences (Rezaei 2015). Missing data of up to 5% is within the accepted margins, and hence does not cause problematic results (Hair *et al.* 2013). Gold and Bentler (2000) recommend use of the Expectation Maximisation Method (EMM) to manage any missing values. Thus, the second phase of the data analysis was to adjust the missing values.

EMM generated Little's MCAR test statistics via SPSS 21.0, and according to test assumptions, the result should produce an insignificant Chi-Square result for randomization of missing values. The test result indicated that the data presented insignificant values, and values for the model were Chi-Square = 9171.382, DF = 1378, Sig. = 0.784.

4.2.2. Common method bias

Common method bias (CMB) influences the validity of the findings due to the item reliabilities, structural relationships and the co-variation between latent variables, which makes it crucial in quantitative studies (MacKenzie, Podsakoff 2012). Thus, the study applied Harman's one-factor test to determine whether the data includes any potential CMB (Hashim 2012). Statistical results suggest that common method biases are not a concern in this study, as CMB were found to be lower than 40% as recommended (Hashim 2012).

4.2.3. Non-response bias

Finally, to ensure that non-response bias is not a concern for the study, or in other words, the model constructs were the same in both early and late stages of administration, demographic indicators and responses were collected individually (Hair *et al.* 2013). It is widely accepted that non-response bias influences the generalizability of the research findings, and therefore are considered crucial during the data collection phase of questionnaire survey methods (Hair *et al.* 2013). Thus, based on the criterion – p- value for the t-statistics greater than 0.05 – there were no early and late response conflicts (Hair *et al.* 2013).

4.3. The measurement model

Prior to structural equation modelling, it is important to examine relationship between the latent variables and their items. The measurement model of the study was further assessed based on the composite reliability, outer loadings, Cronbach's alpha, average variance extracted (AVE) and discriminant validity (Wong 2013). As presented in Table 2, the majority of the outer loadings are above the minimum (satisfactory) threshold value of 0.70 (Wong 2013). Composite and internal (Cronbach's α) reliabilities are also above the minimum of 0.70, therefore the measures are robust in terms of their internal consistency reliability (Wong 2013). The AVE values for each construct exceeded 0.50, which demonstrates statistical significance of all items of the measurement model, and is consistent with the guidelines of Fornell and Larcker (1981).

In addition, Fornell-Larcker criteria were used (Ihtiyar 2018) to assess discriminant validity, which indicates the extent to which a given construct differs from other constructs (Roldan, Sanchez-Franco 2012). The discriminant validity results of all constructs are presented in Table 3, where the square roots of the AVEs of each construct are greater than their correlations with any other construct, hence supporting the discriminant validity of the constructs (Al-Gahtani *et al.* 2007).

Table 2. Measurement model assessment

Items	Loadings	C.Alpha	rho_A	CR	AVE
BI3	0.827	0.807	0.911	0.875	0.699
BI1	0.883				
BI2	0.797				
CS1	0.839	0.847	0.855	0.907	0.766
CS2	0.881				
CS3	0.904				
ASU1	0.832	0.897	0.903	0.920	0.658
ASU2	0.782				
ASU3	0.797				
ASU4	0.826				
ASU5	0.842				
RLB1	0.787	0.853	0.861	0.895	0.631
RLB 2	0.820				
RLB 3	0.803				
RLB 4	0.839				
RLB 5	0.718				
EMP1	0.801	0.743	0.758	0.838	0.566
EMP2	0.696				
EMP3	0.829				
EMP4	0.669				
RES1	0.933	0.912	0.928	0.944	0.850
RES2	0.911				
RES3	0.922				
TNG1	0.856	0.883	0.896	0.915	0.685
TNG2	0.893				
TNG3	0.890				
TNG4	0.796				
TNG5	0.684				

4.4. The structural model

Once a satisfactory assessment of the measurement model has been achieved, it is possible to further evaluate the structural model. PLS-SEM mainly focuses on prediction, and its aim is to maximise the variance of the dependent variables. Thus, the first step of a PLS model evaluation

should be on the basis of the coefficient of determination ($R2$), which indicates the amount of variance, and is a measure of the predictive power of the construct in question (Chin 2010). To achieve a required level of explanatory power, Chin (1998) classified the $R2$ values as substantial, moderate, and weak for 0.67, 0.33 and 0.19, respectively. Thus, the model explains 41.2% of the variance in client satisfaction and 33% of the variance in behavioural intention, which indicates a moderate level of explanatory power (refer to Figure 2).

Discussion and conclusions

Several authors have emphasized the multi-dimensional nature of service quality and its influence on construction client satisfaction (Kang, James 2004; Yang, Peng 2008; Kärnä *et al.* 2009; Li *et al.* 2013; Aliakbarlou *et al.* 2017; Hadidi *et al.* 2017; Ihtiyar 2017). However, a review of the relevant literature suggests that the findings in other countries' context may not be applicable in Cambodia, which is obviously due to the difference in the perception of service quality among construction clients in the country. Therefore, this study sought to verify the Cambodian perspective that conceptualizes client satisfaction in relation to dimensions of service quality (refer to Table 1). This study reveals several interesting outcomes. Firstly, this study tested and confirmed the positive influence of service quality dimensions on construction client satisfaction. A second finding of this study is the confirmation of the significant influence of client satisfaction on behavioural intention from the Cambodian construction clients' perspective. Further, Table 4 presents the hypotheses of this research and conclusions, where the 'conclusion' column explains whether that hypothesis was supported.

Furthermore, SmartPLS-based results show that all path coefficients are positive (i.e. in the hypothesized direction) and statistically significant at $p < 0.01$. The structural model results show a positive relationship between all constructs of service quality and client satisfaction.

First dimension of service quality is reliability, which refers to whether the project procured at the promised time, has a positive but weak ($\beta = 0.227$) effect on CS, which is in contrast to past findings by Sunindijo *et al.* (2014). The second dimension is assurance has also the similar influence ($\beta = 0.227$) on CS, which concerns the

Table 3. Fornell-Larcker criteria (adopted from Al-Gahtani *et al.* 2007)

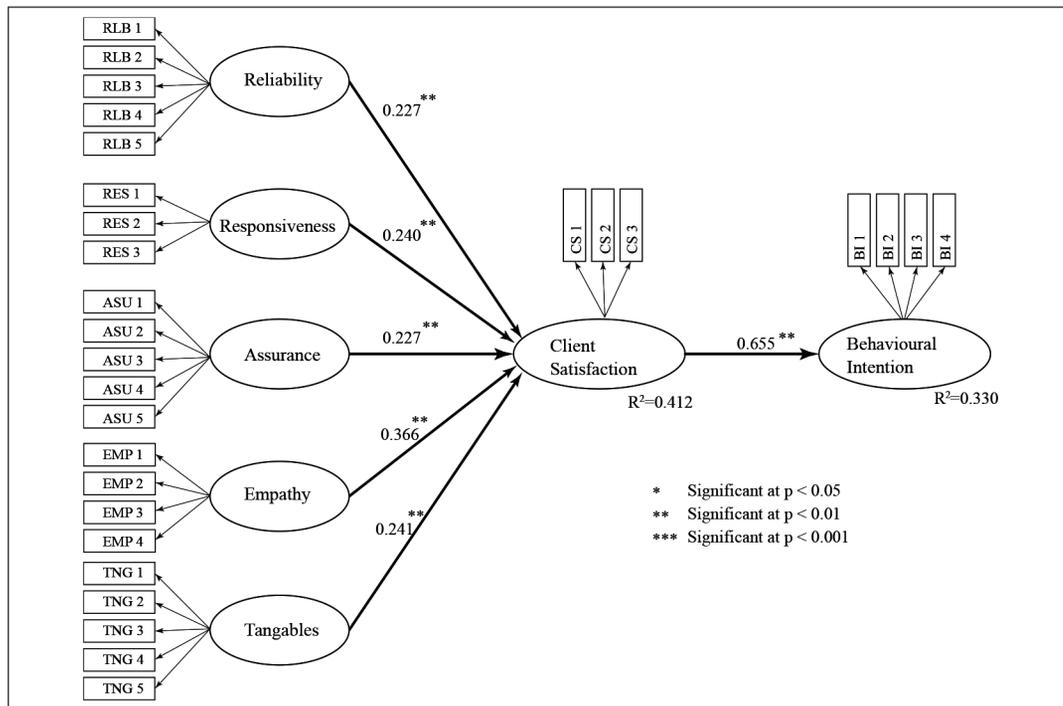| Constructs	BI	CS	ASU	RE	EMP	RS	TNG
BI	**0.699**						
CS	0.055	**0.766**					
ASU	0.003	0.516	**0.658**				
RLB	0.002	0.529	0.464	**0.631**			
EMP	0.013	0.430	0.670	0.384	**0.566**		
RES	0.066	0.514	0.462	0.628	0.388	**0.850**	
TNG	0.022	0.531	0.533	0.595	0.508	0.237	**0.685**

Figure 2. The structural equation model

contractor's quality standard, knowledge to answer the questions posed by client, and the most significant one is whether contractor provides all these services in courtesy. The result corroborates with the findings of Fischgrund and Omachonu (2014). Responsiveness, which is the third

Table 4. Hypotheses conclusions of the research

Hypothesis	Finding	Conclusion
H1: Reliability has a positive influence on construction client satisfaction	Yes ($\beta = 0.227$, $p < 0.01$)	Supported
H2: Responsiveness has a positive influence on construction client satisfaction	Yes ($\beta = 0.240$, $p < 0.01$)	Supported
H3: Assurance has a positive influence on construction client satisfaction	Yes ($\beta = 0.227$, $p < 0.01$)	Supported
H4: Empathy has a positive influence on construction client satisfaction	Yes ($\beta = 0.366$, $p < 0.01$)	Supported
H5: Tangibles has a positive influence on construction client satisfaction	Yes ($\beta = 0.241$, $p < 0.01$)	Supported
H6: Customer satisfaction has a positive influence on behaviour intention	Yes ($\beta = 0.655$, $p < 0.01$)	Supported

dimension, is characterized by the willingness to help clients, provision of immediate service and keeping the client updated on the performed service, and has a positive but weak to be significant ($\beta = 0.240$). This confirms Kang and James (2004) result in which they found that the responsive contractor will continuously update the client who would eventually make a positive contribution. While tangibles has a similar positive but weak influence ($\beta = 0.241$) to be significant on CS, which is concerned with the resourcefulness of the contractor, empathy, which is characterised by has the highest significance ($\beta = 0.366$) among the constructs of service quality. Above all, the model reveals a strong and positive relationship between the construct CS and behavioural intention ($\beta = 0.655$), which aligns with the research findings of Kang and James (2004) and Sunindijo *et al.* (2014).

Considering the positive and influence of the service quality constructs on client satisfaction, construction companies should pay more attention to: 1) responsiveness by providing just on time information (RES1), and service (RES2) (Sunindijo *et al.* 2014); 2) reliability by delivering a project as promised (RLB1) (Lloyd-Walker, Walker 2011) along with a continuous work progress report (RLB5) (Karna 2004) and helpful approach towards solving clients' problems (Fischgrund, Omachonu 2014). Moreover, assuring the client with the highest quality of project work (ASU2) (Gunning 2000) and displaying consistent courteous (ASU3) (Kale, Arditi 2002) were significant, which is particularly relevant in the Cambodian cultural context.

Implications for research and industry. In the context of the global construction industry, the research outcomes have enriched knowledge about the relationship between service quality, client satisfaction, and behavioural

intention in a typical developing country setting. In the context of the construction industry of Cambodia, the contribution of this study to fill a significant knowledge gap cannot be disregarded, as it quantifies the relationship between the constructs. It is hoped that the confirmation of the theoretical model of the study provides guidance for players at the forefront of the industry to understand how construction clients assess the quality level of services, and how contractors meet their needs. The general perception of the quality of services among construction clients in Cambodia is towards the main objectives of a typical construction project, which are time, cost and quality. In other words, as long as a construction project is completed within the planned time and cost, and complies with quality requirements, the client satisfaction level is perceived to be at the highest level. Even though this attitude is consistent with findings of Forsythe (2016), increasing levels of foreign investment in the construction industry (residential projects in particular) increases the level of competitiveness, which therefore forces local companies to focus their efforts towards an increase in the service quality they provide, and ultimately in their ability to procure future new projects.

Limitations of this study. First, the findings of this study were influenced by the feedback from the construction clients of small and medium projects in Cambodia. However, future research can be conducted to include the representatives of large construction projects delivered in the country. Second, the questionnaire survey used in this study was administered to construction clients in the Khmer language. The meanings of some of the statements are assumed to be unintentionally altered during the translation from English to the local language. Lack of input from other construction stakeholders, who are responsible for the quality of the construction service provided, is another significant limitation of this study.

Although the outcomes of this study were a short scoping exercise, they form a significant base for the relationship between service quality, client satisfaction and behavioural intention in the Cambodian construction context. The scope of the findings is hoped to be sufficient to draw a picture of the relationship between the constructs, and report that service quality has a significant influence on client satisfaction, and therefore on the future behaviour intention of the client. Therefore, the significance of the items under the clusters is strong enough to motivate industry stakeholders to address the items and invest in improving them. Thus, service quality among construction companies (domestic companies in particular) in Cambodia can be significantly improved to enable efficient delivery of projects at the required level of quality and adjust their service strategies for the competitive construction environment. In addition, the findings are not future-proof; therefore, rapid changes in the construction industry of Cambodia would necessitate re-investigation of service quality items and re-quantification of the influence of service quality on client satisfaction.

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