CONCEPTUAL MODELS OF SATISFACTION LEVEL IN CONSTRUCTION

Md. Asrul Nasid Masrom¹
md.masrom@student.qut.edu.au
Martin Skitmore²
rm.skitmore@qut.edu.au

Abstract:
It is recognized that, in general, the performance of construction projects does not meet optimal expectations. One aspect of this is the performance of each participant, which is interdependent and makes a significant impact on overall project outcomes. Of these, the client is traditionally the owner of the project, the architect or engineer is engaged as the lead designer and a contractor is selected to construct the facilities. Generally, the performance of the participants is gauged by considering three main factors, namely time, cost and quality. As the level of satisfaction is a subjective measurement, it is rarely used in the performance evaluation of construction work. Recently, various approaches to the measurement of satisfaction have been made in attempting to determine the performance of construction project outcomes – for instance client satisfaction, consultant satisfaction, contractor satisfaction, customer satisfaction and home buyer satisfaction. These not only identify the performance of the construction project, but are also used to improve and maintain relationships. In addition, these assessments are necessary for continuous improvement and enhanced cooperation between participants. The measurement of satisfaction levels primarily involves expectations and perceptions. An expectation can be regarded as a comparison standard of different needs, motives and beliefs, while a perception is a subjective interpretation that is influenced by moods, experiences and values. This suggests that the disparity between perceptions and expectations may be used to represent different levels of satisfaction. However, this concept is rather new and in need of further investigation. This paper examines the current methods commonly practiced in measuring satisfaction level and the advantages of promoting these methods. The results provided are a preliminary review of the advantages of satisfaction measurement in the construction industry and recommendations are made concerning the most appropriate methods for use in identifying the performance of project outcomes.

Keywords: Performance measurement, satisfaction level, methods, advantages.

INTRODUCTION
Performance of construction is one of the issues that have been debated for many years. Numerous efforts have been made in attempting to enhance outcomes of construction performance. Despite the effective evaluation of the overall project outcomes being seen as fundamental, the optimal approach has not yet been discovered. The evaluation of the performance is gauged mainly on the basis of three main dimensions, namely cost, time and quality. However, soft measurements that consider participants’ satisfaction have also been used in construction in order to improve the existing methods.

Satisfaction is used as an indicator for Key Performance Indicators (KPIs), for instance in identifying client satisfaction, customer satisfaction, contractor

¹ Phd Student, School of Urban Development, Faculty Built Environment and Engineering, Queensland University of Technology, Brisbane
² Professor, School of Urban Development, Faculty Built Environment and Engineering, Queensland University of Technology, Brisbane
satisfaction and home buyer satisfaction. Typically, these are regarded as a comparative function between perceptions and expectations (Cheng et al., 2006). Lam et al. (2008) state that projects that are delivered on schedule, are functional, fulfill safety requirements and conform with users’ expectation greatly influence the judgement of performance. Moreover, owner satisfaction and profit margins are considered as indicators in performance measurement (Ling et al., 2008). Although many efforts have been made concerning this issue, there is an absence of a common understanding among the participants towards this approach. Given the above, the aim of this study is to identify methods that are commonly applied in gauging performance satisfaction levels in relation to project outcomes.

**PERFORMANCE MEASUREMENT IN CONSTRUCTION INDUSTRY**

Systematic measurement of performance is a significant activity as it is needed in order to determine areas of improvement. Basically, performance can be assessed on two dimensions - objective measures and subjective measures (Figure 1). The objective approach uses mathematical formulae to calculate the value, while the subjective approach uses subjective opinions and the personal judgement of participants, which mainly includes the quality and functionality of the building and satisfaction levels of the participants (Chan and Chan, 2004).

![Key Performance Indicators (KPIs)](image)

**Objective measures**
- Construction time
- Speed of construction
- Time variation
- Unit cost
- Net present value
- Accident rate

**Subjective**
- Quality
- Functionality
- End-user’s satisfaction
- Design team satisfaction
- Construction team satisfaction

Figure 1: Key Performance Indicators (KPIs) (Chan and Chan, 2004)

The time performance of the project is monitored according to the work program prepared prior to commencement of the project. Chan and Chan (2004) assert that time is the duration needed to complete the project according to its schedule and is calculated as the numbers of days or weeks from starting on site to the practical completion of the project.

Moreover, project performance can also be defined by the cost performance of the project. According to Ling et al. (2008), cost performance is a measurable indicator. Hence, it can predict the difference between the actual and the budgeted cost of the project. Dissanayaka and Kumaraswamy (1999)
note the consensus view is that having projects completed within budget and close to the original cost estimate constitutes project success. Although cost performance indicators are broadly used to enhance the performance of projects, project failure still seen as an inevitable problem due to several causes. For example, strategies not fully understood by the participants, lack of clarification of tasks to be performed, lack of milestones defining completion dates and an insufficient planning process (Doloi and Lim, 2007).

Conversely, measures of quality, functionality and satisfactions are rarely used in evaluating the level of the project performance due to their subjective nature and need for in-depth interpretation. Differences in levels of happiness, personalities, places and situations are further complications. Nevertheless, the relationship between the quality of outcomes, satisfaction levels and project performance has been continuously investigated by many researchers over the last ten years.

Quality is a common determinant that is applied to assess the level of the performance in construction projects. Ennew et al. (1993) define quality as the ability of a service or product to perform its specified tasks. In addition, project performance can also be obtained based on the participants’ satisfaction levels. This approach can provide a negative or positive result by comparing perceptions and expectations. Martzler et al (2004) agree that satisfaction measurement is a relevant method in encouraging the continuous improvement of the project. However, these approaches suffer from limitations and are in need of improvement.

BASIC CONCEPT OF SATISFACTION MEASUREMENT
Measures of performance can be made in many ways. Previous studies show that performance is mainly determined by the participants of construction projects and is also interdependent. Soetanto and Proverbs (2002) assert that satisfaction measurement generally involves psychological processes. Therefore, it would be useful if some consensus existed on the definition of satisfaction. As Oliver (1980) explains, satisfaction is derived from the Latin satis (enough) and facere (to do or make). This suggests that satisfying products and services have the capacity to provide what is being sought to the point of being enough. Something that satisfies adequately fulfils expectations, needs or desires and gives what is required, leaving no room for complaints.

Churchill et al., (1982) conclude that most of the previous research focuses on the link between expectation and perceived performance. In addition, expectations, experiences and knowledge have been shown to be basic judgements in evaluating satisfaction (Woodruff et al., 1983). In business, customer evaluation is important in order to meet the customer’s expectations, create loyalty and meet challenges. It also encourages service providers in maintaining high service quality and assists in determining the level of employees’ performance and efficiency (Liu et al., 2006). In marketing disciplines, satisfaction is examined by comparing pre-purchase expectations with post-purchase perceptions (Forsythe, 2007). To further understand the
The process of satisfaction, Oliver (1996) demonstrates a complete process as shown in Figure 2.

**Figure 2: The Complete Satisfaction Process (Oliver, 1996)**

Satisfaction has been considered in various perspectives. For instance, job satisfaction has been broadly studied. Nerkar et al. (1996), for example, found that an individual assessment of job satisfaction is a function of the discrepancy between what an individual expects from the job and what the individual receives. In other words, job satisfaction can be measured as the extent to which rewards meet the perceived equitable level of rewards and providing a positive emotional response for job experiences. In marketing management, consumer expectations are determined by the implicit comparison of expected and actual. Czeplael et al. (1977) suggest that three formulas are appropriate in gauging expectations as part of satisfaction measurement (Figure 3). However, consumer satisfaction and decision processes may be influenced by several variables such as attitudes, perceptions, psychographic segments and behavior. In summary, therefore, satisfaction is a judgement or response made by the participants concerning a product or service and which also provides a pleasurable level of consumption fulfilment.

**Equation 1:** \[ CS = \sum \text{facets} \ (\text{Should Be} - \text{Now}) \]

**Equation 2:** \[ CS = \sum \text{facets} \ (\text{Would Like} - \text{Now}) \]

**Equation 3:** \[ CS = \frac{\sum \text{facets}}{\sum} \ (\text{Expected to Be} - \text{Now}) \]
Studies of satisfaction have been carried out since the 1960’s (Oliver 1980). Commonly, major marketing research used to assess likely client satisfaction is done through opinion surveys. Several aspects or criteria are used to identify levels of client satisfaction, including product quality, service quality, cost management and timeliness (Nowak and Washburn, 1998).

Thurau and Klee (1997) assert that quality is primarily treated as an overall construct based on previous experience and the impressions of the customer in relation to a product or service. A client’s evaluation of product quality in marketing research is based on the feedback given concerning the overall quality of the final product and clarity of results. SERVQUAL is a scale used in evaluating the perceptions-expectations gap (Figure 4). It is a component of overall client satisfaction as it comprises tangibles, reliability, responsiveness, assurance and empathy (Cronin, 1994). However, this approach has limitations as customers do not necessarily purchase the highest quality service, but may also consider convenience, price and availability factors.

Cost management has been found to be the most important factor in ensuring the provider delivers a product or service within budget. This measure is one of cost management and not of ability to provide the product at the lowest cost (Su, 2004). However, timeliness is often a major concern for clients who are under pressure to react quickly to changing market conditions in a highly competitive environment (Nowak, 1998).
On the other hand, customer satisfaction or dissatisfaction results from experiencing a service and comparing that experience with the quality of service that was expected. Many studies of customer satisfaction have concluded that there is a significant relationship between customer satisfaction and loyalty (Su, 2004; Wirtz, 2001; Grigoroudis and Siskos, 2004; Liu et al., 2006; 1999; Walker, 2001). Hence, the primary objective of service providers and marketers is identical, for example to develop and provide services that satisfy customer needs and expectations. In short, throughout the service industry, the goal of the service marketer is to close or narrow the gap between expectations and perceptions of customers.

**CONCEPTUAL MODELS OF SATISFACTION MEASUREMENT IN CONSTRUCTION**

The construction industry is challenged by the need to cope with change. Performance measurement is dominated by the main parameters of quality, time and cost of projects. However, to obtain a high product quality, performance must be evaluated thoroughly and effectively. Success can be considered to have occurred if the project is completed within the required budget, time given and quality as specified in the contract, but the client still needs to be satisfied. For that reason, satisfaction is an appropriate indicator for evaluating the performance of a project. The construction industry is similar to the marketing or business industry in terms of the involvement of numerous stakeholders and their satisfaction related to the performance of subsequent projects. Recently, many studies have been undertaken concerning behavioural management - mainly of client satisfaction and customer satisfaction (Palaneswaran et al., 2006; Wong, 2004).

Studies of satisfaction have noted that satisfaction is subjective and difficult to measure and that models of satisfaction are largely conceptual (Procter et al, 1999). However, there are attempts to deal with client satisfaction of consultant performance. Commonly, satisfaction can be assessed at interim stages, final stages and overall. Three elements are applied in satisfaction measurement: comparing product and service delivery, final outcome satisfaction and satisfaction with satisfaction. Cheng et al. (2006), assert that overall services, technical accuracy and people are the key performance attributes for consultants as perceived by clients.

Satisfaction evaluation is fundamental for construction participants if they are to survive in the marketplace. Tang et al. (2003) has concluded that by measuring client satisfaction, the performance in delivering services can be improved continuously and areas can be identified for improvement by consultants. For example, research has shown that more effort is needed to overcome the weaknesses of engineering consulting services in Hong Kong, as these are slightly greater than professional services in general. Cheng et al. (2006) identify technical accuracy, overall quality of service, people and effective communication as main client satisfaction criteria. Mbachu and Nkado (2006) found that there are areas for improvement in the services of contractors and consultants, noting the evaluation of client satisfaction to be a
result of the clients’ perceived average levels of satisfaction in the building development process.

Sohails (1995) stressed the benefit of taking an aggressive approach to identify client satisfaction levels and the changes needed to eliminate problems. In the construction industry, the clients’ needs or requirements are usually assumed to be to attain the end product within budgeted cost and time. Soetanto and Proverbs (2004) have suggested that satisfaction and performance are related, as performance outcomes are the input and levels of satisfaction or dissatisfaction are the output (Figure 4). Most of the studies agree that between the input and output, a psychological processing, or black box, exists that requires rational consideration in making decisions.

![Figure 4- A mediated performance model of satisfaction (Soetanto and Proverbs, 2002)](image)

The model in Figure 5 is based on the major factors that influence client satisfaction of contractor performance - namely timeliness, client orientation, communication, cost, quality and response to complaints (Ahmed et al., 1995). Soetanto and Proverbs (2004) emphasize the importance of measuring an abstract notion, such as the satisfaction level, and stress that the concept should be observable, measurable and defined at an operational level.
Moreover, Cheung et al. (2000) propose dispute resolution satisfaction as an effective measurement for the attainment of project objectives (Figure 6), as it is consists of several variables that need to be considered. This shows that the evaluation of satisfaction enables clients to reduce uncertainty and antagonism, hence improving working relationships and trust.

On the other hand, client satisfaction evaluation can be implemented to help maximise long term profits. This could be achieved by avoiding several situations, such as project team changes, multiple architect/engineer team contracts, schedule delay and missed milestones, over designing, negative approaches to problems, low quality product, slow response for any queries, slow review submittals, weak leadership and absence at final completion (Haransky, 1999).

In addition, there are studies that largely emphasize customer satisfaction and the difference between expectations and perceptions. Maloney (2002) incorporates these ideas into guidelines for customers in evaluating electrical
contractor service quality and their influence on perceived quality. Moreover, Yang and Peng (2008) emphasise that evaluating the performance of service providers helps them to improve their services. They used a questionnaire survey and statistical analysis as a tool for assessing satisfaction levels.

Several research projects have been undertaken aimed at developing a satisfaction evaluation methodology for the construction industry and the measurement of satisfaction in performance of procurement systems. As an example, Jamali (2007) found satisfaction evaluation to be appropriate for measuring the level of customer satisfaction of the quality of services received by Public-Private Partnerships (PPP). As illustrated in Figure 6, SERVQUAL measures customer satisfaction by incorporating both a cognitive component (assessment of basic quality dimensions) and affective components (including variable such as emotions, attributions and perceptions of equity).

![Figure 6- Service Quality (Dima Jamali, 2007)](image)

Forssythe (2007) stated that customer satisfaction in the residential construction industry is influenced by genetic make-up and emotional influences. In addition, there are four components involved in customer behaviour when making decisions - such as decision process, input, information processing and decision process variables. This approach could constitute a competitive advantage in the market place, increased market share, improved profitability and increased reputation. Leung et al (2004) believe the discrepancies between goals derived from the measurement can enhance levels of satisfaction.

Based on the above discussion, there is a consensus among researchers that consideration of satisfaction levels of construction projects will ultimately create a performance-enhancing environment. This would lead to harmonious working relationships between participants, the pursuit of continuous improvement, a mutual process in the real sense and support for the development of long-term relationships and high satisfaction levels (Soetanto and Proverbs, 2004; Cheong et al., 2003; Leung et al., 2004; Haransky, 1999; Ahmed et al., 1995; Naoum, 1994). However, there have been few studies focusing on the level of contractor satisfaction as an indicator of performance, although contractor satisfaction is the best predictor in the early stage of the
project (to identify problems before they develop into conflicts and predicting contractor satisfaction levels). A model of contractor satisfaction (Figure 7) based on client performance has been established in order to identify corrective action needed, improve cooperation and communication and to maintain trust and cohesiveness (Soetanto and Proverbs, 2002).

CONCLUSION
Performance measurement has been widely studied in the construction industry. Recent interest in gauging performance based on subjective indicators such as satisfaction levels could be seen as a new attractive approach in this field. Measurement based on satisfaction levels is commonly used in marketing and business as customer loyalty can be evaluated according to the gap between the expected and perceived performance. Satisfaction measurement has been used in measuring construction project performance as it can also encourage the participants in maintaining high service quality and determining efficiency. The approach has been extensively applied to measure client satisfaction, customer satisfaction and home buyer satisfaction. Although contractor satisfaction is rarely used it still seen as the best predictor for improved project outcomes and as a prerequisite for harmonious working relationships.

This preliminary study indicates that different participants judge satisfaction in different ways. The level of client satisfaction is influenced by time, cost, client orientation, communication skills and the effectiveness of response to
complaints. Contractor satisfaction should be achieved by completing a project according to plan, within cost and time budgets, satisfying owner needs and generating profits. Future work will investigate this further by in-depth interviews and surveys of Malaysian contractors’ satisfaction of client performance. The detailed result is expected to provide a useful assessment method for contractors and clients in enhancing construction performance.

REFERENCES


