

THE IDENTIFICATION OF MALAYSIAN CONTRACTOR SATISFACTION DIMENSIONS: A STRATEGY FOR CONTINUOUS IMPROVEMENT

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ABSTRACT: The unique characteristics of the construction industry - such as the fragmentation of its processes, varied scope of works and diversity of its participants - are contributory factors to poor project performance. Several issues are unresolved due to the lack of a comprehensive technique to measure project outcomes including: inefficient decision making, insufficient communication, uncertain site conditions, a continuously changing environment, inharmonious working relationships, mismatched objectives within the project team and a blame culture. One approach to overcoming these problems appears to be to measure performance by gauging contractor satisfaction (Co-S) levels, but this has not been widely investigated as yet. Additionally, the key Co-S dimensions at the project level are still not fully identified.

This paper concerns a study of satisfaction dimensions, primarily by a postal questionnaire survey of construction contractors registered by the Malaysian Construction Industry Development Board (CIDB). Eight satisfaction dimensions are identified that are significantly and substantially relate to these contractors - comprising: project cost performance, schedule performance, product performance, design satisfaction, site safety, project profitability, business performance and relationships between participants. -Each of these dimensions is accorded different priority levels of satisfaction by different contractors.

The output of this study will be useful in raising the awareness and understanding of project teams regarding contractors' needs, mutual objectives and open communication to help to deliver a successful project.

Keywords: Performance measurement, contractor satisfaction, dimensions, priority levels, project team, Malaysia.

1. INTRODUCTION

As indicated in the 9th Malaysian Plan Development Budget, Malaysian development continues to grow. According to this budget, the total allocation amount of RM220 billion has been segregated to the several sectors such as economic, social, safety and administration. Comparatively, the economic sector has been received the largest allocation, amounting to RM89.89 billion and RM1.29 billion from the Private Finance Initiative (PFI) or 41.4% of the total amount. The additional of 17.6% for the 9th Malaysian Plan is expected to generate more opportunities, including additional construction projects, infrastructure, public amenities, city transportation and utilities. To ensure these projects can be effectively delivered several challenges and problems that plague the Malaysian construction may usefully be sought to be addressed.

Over the years, issues related to the lack of integration, insufficient effective communication, mismatched objectives, uncertainty and the changing environment remain unresolved. Consequently, construction projects in Malaysia are burdened with numerous problems such as delay, slow decision-making, low productivity, conflict, inharmonious working-

relationships, rising costs of building materials, reliance on foreign workers, low quality of construction work and lack of professionalism among the project team. According to the Construction Industry Master Plan (CIMP) 2007, the inefficient and ineffectiveness of the project team in producing high quality projects is recognized as a contributory factor to this problem. Additionally, three main factors contributing to the quality failures in Malaysian construction projects are: design faults, contributing to 50% of quality failures; the construction faults (40%); and material faults (10%). One approach to addressing these problems is to improve existing performance measurement methods.

The revolution of development performance measurement (PM) for construction projects has received much attention in the literature in recent years and has shifted in emphasis from the tangible to intangible resources in order to strengthen the weaknesses of existing methods. Additionally, more subjective approaches have been developed to supplement the traditional but limited *iron triangle* solely based on the objective measures of time, cost and quality. As a result, subjective approaches such as satisfaction measurement (SM) are being progressively used to measure the level of project performance. The benefits of SM in improving the

performance of construction projects can be achieved by paying closer attention to key participants' (such as clients, designers, contractors and customers) perceptions. Conversely, numerous previous studies assert that the adoption of SM in construction projects has focused purely on client satisfaction (Cl-S), customer satisfaction (Cu-S) and home-buyer satisfaction (Ho-S), with the importance of study on contractor satisfaction (Co-S) being often neglected.

Previous empirical studies emphasize that the Co-S approach is beneficial and valuable in identifying problems occurring during the project delivery. However, the improvement of existing Co-S studies is necessary as they have been limited to only client performance. Additionally, the construction project Co-S model also may benefit from accommodating evolving circumstances such as increased scope of works, diverse participants and the high complexity of projects. Therefore, the specific objective of this paper is to identify the potential Co-S dimensions for Malaysian construction projects. The findings presented in this paper are concerned specifically with the priority level of the Co-S dimensions that will be useful to increase the participants' understanding of the contractors' needs and requirements in undertaking projects.

2. SM IN THE CONSTRUCTION INDUSTRY

PM has been developed to improve project performance in many different fields, such as the hospitality, service and construction industries. There is growing evidence that PM is primarily concerned with tangible factors or objectives measures (time, cost, quality) due to fact that intangible factors have no physical existence or exact determinants. That is, numerous past PM studies place more emphasis on objectives measures and their implementation regarding the project, business, procurement and participant's performance, rather than considering them from a subjective perspective- such as in SM.

In the past decade, the evaluation of subjective measures such as satisfaction has become widely accepted as an appropriate approach for examining performance levels. Although this approach is limited, due to its complexity, subjectivity, intangibility and lack of clarity and consistency [1], several studies [2]; [3]; [4] indicate that SM is appropriate to be used for determining performance levels and measure areas of improvement. This means that satisfaction is still a reasonable indicator as it gauges the discrepancies or differences between expectations and perceptions. Previous authors, e.g., [5], also have supported the notion that satisfaction can be derived by performance outcomes as the input, and levels of satisfaction or dissatisfaction being the output.

Performance studies have highlighted the benefits and importance of SM in different areas. Some of the advantages given are that it is: appropriate to boost repeat business and thus increase long-term profitability [2]; applicable to measure customer perceived value of a product or service that can be enhanced by eliminating the complaints [6]; adequate as a tool for marketers to

measure the health of their relationship with customers [3]; useful for a common marketing benchmark for organization and performance [7]; appropriate to develop closer relationships between customer and service providers by sharing information, thus creating customer retention and a sufficient predictor of the quality of service delivery and perceived value [8].

An increased interest in the benefits of SM has resulted in more discoveries on the effects of satisfaction levels on participants' expectations concerning the construction project. Numerous SM conceptual models have been developed that primarily examine client satisfaction (Cl-S), customer satisfaction (Cu-S), home-buyer satisfaction (Ho-S) and occupant satisfaction (Oc-S). However, predicting contractor satisfaction (Co-S) is rarely studied. Continuous improvement by using Co-S is being studied, not only to enhance contractor performance, but also the overall project performance. As pointed out in several studies, the contractor is an organization selected by the client and responsible for carrying out the project efficiently and therefore sustaining the contractor's position in the market place. Recurring support from the entire project team is important to ensure the contractor is kept motivated by addressing participants' needs and requirements [9]. The theory of motivation offered by Maslow [10] states that an organization has some basic needs that must be fulfilled. This means that the achievement of basic needs is also important to make the contractor satisfied and motivated. Therefore, the improvement of Co-S is necessary, as this assessment is able to identify areas of improvement and corrective action to be undertaken based on the contractor's perspective. Additionally, the approach is suited to addressing performance issues in terms of the weaknesses and strengths of the project participants [11]. As a result, continuous improvement and harmonious working relationships can be maintained.

A set of eight key dimension of Co-S is shown in Table 1. These key dimensions were derived from an extensive literature review and preliminary interviews with Malaysian contractors. Details of the significance of the Co-S dimensions from the contractor's perspective are examined and discussed in a subsequent section. As Table 1 indicates, the eight key dimensions that potentially impact on contractor satisfaction levels are: cost performance; time performance; product performance; design performance; site safety; project profitability; business performance; and the relationship between participants. For example, a contractor is expected to be satisfied when a project is completed as stated in the contract in terms of time, cost and quality. Differences in profit margins also contribute to project performance, which may influence Co-S levels. Several project performance studies can be applied in the Co-S framework since Co-S is influenced by the performance of a product and service. Additionally, Soetanto and Proverbs [11] stress that project performance is one of the performance attributes that significantly impact on Co-S levels. A number of additional project performance items are important for measuring Co-S but have not been considered in previous Co-S studies.

Table 1. Contractor satisfaction (Co-S) dimensions

Co-S Dimension on projects	C1	Project cost performance (actual vs. budget)
	C2	Schedule performance (actual vs. plan)
	C3	Product performance
	C4	Design satisfaction
	C5	Site safety
	C6	Project profitability
	C7	Business performance
	C8	Relationship between participants

3. OVERVIEW OF METHODOLOGY

The study involved the use of a questionnaire survey to identify the priority levels of the Co-S dimension on performance. A combination of literature relating to performance and satisfaction measurement was employed in developing the questionnaire. Several previous empirical studies were also referred to for additional guidance.

The questionnaire consists of general information concerning the respondents and specific questions in relation to Co-S dimensions. The first part of the questionnaire asked respondents to provide information concerning their current position, educational background, experience in the construction industry and the nature of the organisation itself. A subsequent section contained questions relating to a specific previously completed construction project selected by the respondent. Based on the project selected, the respondents were requested to indicate their satisfaction levels for each dimension, on a 5-point Likert Scale, where 1 referred to extremely dissatisfied and 5 referred to extremely satisfied. The degree of satisfaction was related to the overall impact of the project. The draft questionnaire was subjected to several stages of pilot testing to verify its suitability and lack of ambiguity in layout, wording, sequence and clarity [12]. Necessary revisions were made based on the feedback provided by a small sample of contractors, experts and researchers. Two versions of the final questionnaire in Malay and English were developed. Both were again piloted before the main survey began.

The questionnaire was sent out to various grades of Malaysian contractors, complete with a covering letter clarifying the purpose of the study and assurances of anonymity. The respondents were chosen from a list of contractors produced by the Malaysian Construction Industry Development Board (CIDB). A total of 300 questionnaires were dispatched via conventional mail. The questionnaires were addressed to professional

respondents holding positions at the middle or higher management levels of the company. 139 responses were returned, of which 129 (43% response rate) were answered completely and clearly.

4. RESULTS AND DISCUSSIONS

Most of the respondents are professional workers with an appropriate academic background. Further, almost half of the respondents have 6 years to more than 15 years working experience in the construction industry. The employing organization of the respondents divides into three main groups based on their financial capability to complete a certain value of project. These comprise large contractors (RM10,000,001 and above project value), medium contractors (RM1million to RM10million project value) and small contractors (less than RM500, 000 project value). Figure 1 shows the distribution of questionnaires received from these different contractor groupings. Clearly, almost half the responses are from large contractors.

The data also indicates that the majority of the respondents are involved in building and civil engineering works. A few respondents carry out services work and others are involved in maintenance and landscaping work. Most of the projects involved were procured by the traditional method of competitive tendering.

Figure 1. Distribution of respondents

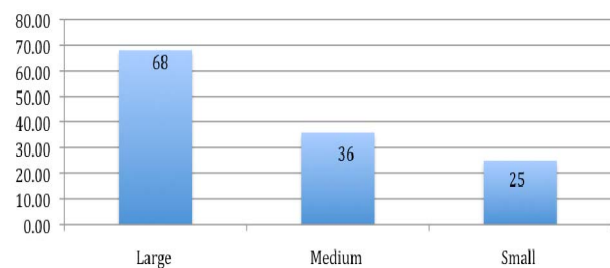


Table 2 summarises the overall ratings of the Co-S dimensions for the specified projects in terms of the mean scores and respective ranks of the overall satisfaction levels.

Table 2. Perceptions of contractor satisfaction levels

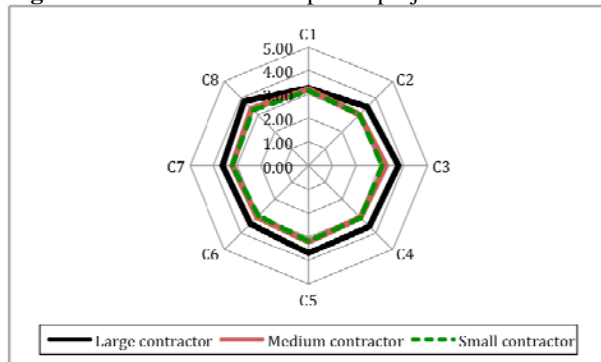
occurring in their projects. These findings strengthen the

Contractor satisfaction (Co-S) dimensions		Mean (SD, Ranking)			
		All (N=129)	Large contractor (N=68)	Medium contractor (N=36)	Small contractor (N=25)
C1	Project cost performance	3.30(0.95, 5)	3.25 (1.08, 6)	3.20 (0.95, 3)	3.14 (0.82, 4)
C2	Schedule performance	3.17(1.05, 7)	3.48 (1.09, 7)	3.02 (1.07, 8)	3.02 (0.98, 7)
C3	Product performance	3.37(0.95, 2)	3.78 (0.87, 2)	3.25 (0.95, 2)	3.09 (1.02, 6)
C4	Design satisfaction	3.26(0.94, 6)	3.61 (0.94, 5)	3.08 (0.90, 6)	3.10 (0.98, 5)
C5	Site safety	3.35(0.91, 3)	3.69 (0.92, 3)	3.20 (0.92, 3)	3.17 (0.88, 3)
C6	Project profitability	3.16(0.98, 8)	3.45 (1.00, 8)	3.05 (1.01, 7)	2.97 (0.94, 8)
C7	Business performance	3.34(0.84, 4)	3.61 (0.93, 4)	3.20 (0.88, 3)	3.20 (0.72, 2)
C8	Relationship between participants	3.50(0.87, 1)	3.82 (0.80, 1)	3.38 (0.86, 1)	3.29 (0.95, 1)

Note: N= Number of respondents, SD= Standard deviation

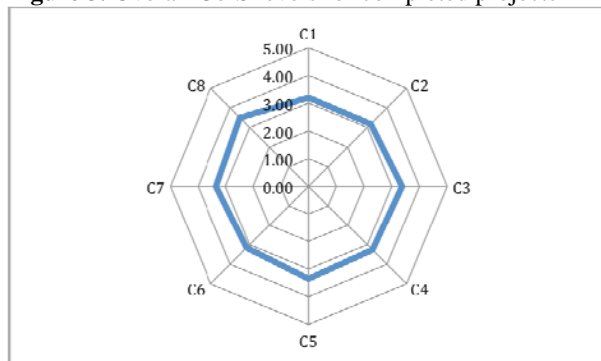
viewpoint of previous studies (for example, [13]; [11]), which stress that this dimension (C8) is essential to help improve project performance and enhance Co-S levels. Thus, improving mutual understanding and openness of communication between all key participants in the supply chain seems to be beneficial in enhancing relationships.

Figure 2. Co-S level on completed project



The findings also indicate that higher product quality (C3) influences contractor satisfaction levels. In addition to time and cost outcomes, construction projects are commonly acknowledged as being successful when the project is completed to as acceptable level of quality. To determine the quality of a product, previous performance measurement studies propose several measures, such as functionality, constructability, accuracy and conformity to specification and fitness for purpose. However, previous performance studies also find that the contractor often neglects the quality of the product and places significantly less attention on the needs of other stakeholders [13]. In contrast, this research reveals that most of the large and medium contractors contend that product performance is satisfactory. This indicates workmanship and quality of the product to be a priority factor for the contractor. To achieve this level of satisfaction, the designer and other participants have to provide sufficient information to contractor. Accurate information to be adopted in a project such as drawings, instruction, estimation and specification therefore improves project outcomes and enables rework on defects to be reduced effectively. From these results, it can be said that a high product performance quality can be achieved by measuring Co-S levels, as this dimension is found to have a potential influence on Co-S levels.

Figure 3. Overall Co-S levels for completed projects



The ranking of the various Co-S dimensions is obtained by computing the means for the overall sample and the separate groups of contractors.

The results (as shown in Figure 2 and Figure 3) indicate that all respondents are satisfied with the relationship of project team members and product performance as these dimensions are rated with the highest mean scores. Relationships between project team members have been widely recognized as an important factor in the success of organizations and projects. The co-operation, honesty, trust and commitment are some key issues that affect the harmony of relationships in a project. Encouragingly, therefore, this result indicates that Malaysian contractors are mostly satisfied with their relationships, probably due to less conflict and dispute

An interesting finding is that most of the contractors are less satisfied with the time performance (C2) of a project. This is probably due to several contributory factors, such as delay, late decision making, late client or consultant responses, changes in the scope of work, and disputes. Schedule performance is commonly known to involve a comparison between the actual and planned project duration. Previous studies also highlight time as one of the factors that greatly influence the success or failure of any project [14]. Commonly, other participants, such as clients, architects or engineers, are conscious of the time performance of projects. However, based on the result, performing the project in a timely fashion is also contributory factor to Co-S levels. Therefore, more

emphasis on the project time - by improving project team delivery, approval and compliance to project specification - is necessary.

Project profitability (C7) is another dimension potentially contributing to Co-S levels on projects as the result show that profit levels also influence Co-S levels. Most of the contractor indicated that the profit gained from the undertaking a project were unsatisfactory. Having sufficient levels of project profit assists contractors gain a competitive advantage [13]. Furthermore, contractors need to compete effectively by developing strategic approaches, increasing project profit and improve financial management to sustain themselves in the market place and create more future business. This means that this dimension is very important to contractors, as it is important for their survival. The key difference found within this performance measurement study, however, was that performance in terms of contractor's profitability was not always a key satisfaction dimension from the client or customer perspectives.

5. CONCLUSIONS

Performance measurement based on satisfaction measurement is a new paradigm that potentially helps enhance project performance. Performance measurement made by integrating key project participants' perception can also make a significant contribution to overall project performance. Therefore, the assessment of the perception of contractors satisfaction should be beneficial and help to increase participant understanding of contractor needs and requirements in the project development process. The survey described in this paper revealed that the relationship between participants (C8) and product performance (C3) are considered to be the most influential in terms of Malaysian contractor satisfaction. This indicates that harmonious working relationships and fulfillment of specification requirements are of great concern for each of the key participants and including the contractor. In contrast, project profitability was ranked relatively low by most of the contractors, showing that there is room for improvement in this aspect.

In summary, this paper has presented and discussed the dimensions that significantly impact on Co-S levels in the Malaysian context. The proposed assessment method is likely to be useful to all key participants in increasing their understanding and awareness of contractor needs, open communication and mutual objectives. The work is also expected to help project team members, particularly in developing countries, to improve their awareness and understanding of the benefits of SM in order to develop a continuous improvement environment.

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