MODELLING CLIENT NEEDS AND SATISFACTION IN THE BUILT ENVIRONMENT

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Client satisfaction adds value to service organizations, including increased market share and profitability levels. The main criterion for assessing client satisfaction in the construction industry is the extent to which procurement processes fulfil clients' 'stated' and 'latent' needs and objectives. The former are expressed in terms of cost, time, quality and other measurable performance criteria. However, by failing to integrate clients' strategic goals and other non-stated needs in delivering end products, service providers also fail to provide high levels of satisfaction to their clients.

It is therefore argued that a clear understanding of client's latent investment objectives as well as the stated preferences and satisfaction criteria at the outset of the procurement process, and subsequent monitoring of the satisfaction levels at distinct stages by using the established criteria, could guide the professionals in delivering satisfactory outcomes. This paper presents a methodological discussion on the development of a theoretical model for this purpose, and demonstrates its application in monitoring client satisfaction levels in the procurement process from a case study scenario. The report is based on the preliminary findings of research into client needs and satisfaction in the built environment.

Keywords: needs assessment, client satisfaction, procurement, professional

INTRODUCTION

Current and future prospects in the building industry depend on the extent to which the building clients are satisfied with the outcomes of their investments in the building procurement process (Turner, 1990). A study of client satisfaction starts with the assessment of needs (Kotler, 1997). It is proposed that clients have two sets of needs. The first set may be consciously or unconsciously concealed, yet its fulfilment brings about satisfaction. The other set consists of the stated needs, which are clients' perceived solutions or stated requirements for the fulfilment of the concealed or real needs. Non-performance, by the service providers, in the fulfilment of the stated needs would lead to dissatisfaction. However, the fulfilment of the stated needs alone does not automatically guarantee client satisfaction, but can only lead to satisfaction if the stated needs or requirements sufficiently address the concealed needs.

Due to inexperience or lack of sufficient time for rationalized approaches to investment decision-making, significant variation may, and in fact do, exist between the stated and real needs. This may be responsible for the widely reported high levels of client dissatisfaction within the building industry (Bowen *et al.*, 1997; Liu and Walker, 1998; Green and Lenard, 1999).

An assessment and understanding of clients' real and stated needs, as well as the satisfaction criteria, is imperative to enable the service providers tailor their offerings

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to satisfy both sets of needs, rather than focusing on the stated needs alone, as currently practised.

This paper aims to develop models for holistic needs assessment, establishment of the satisfaction criteria and, subsequently, to demonstrate the application of the proposed models in the procurement process.

LITERATURE

In the context of this study, 'need' connotes identifiable state of deprivation of, or desire for, some basic satisfaction, which the procurement of building project and/or services can fulfill, when there is an ability and willingness to buy or commission the procurement process. 'Satisfaction' in this context is the client's feelings of pleasure or disappointment resulting from comparing a product's (building or service) performance (or outcome) in relation to his or her expectations (Kotler, 1997).

Client needs could be broadly categorized into two realms: latent needs which may not be directly observed by the use of the conventional briefing instruments (Runyon 1980; Salisbury, 1990), and the stated needs which are the client's perceived solution for realizing the real latent needs (Richardson, 1996).

Goodacre *et al.* (1982) clearly demonstrate that listening to, and acting only upon, the client's stated needs may not yield the desired benefits. Rather, a holistic and result-oriented approach should be used in considering both need categories. Figure 1 illustrates the conventional approach to needs assessment, as is currently practised, and an additional approach suggested for a holistic view of client's overall needs and objectives in the procurement process.

METHODOLOGY

The research adopts a combination of qualitative survey method involving semi-structured interviews at the pilot study stage, and quantitative survey method through the use of a structured questionnaire at the second stage. Forty-eight clients, comprising developers, investors and owner-occupier private sector commercial property clients in four major cities of South Africa (namely, Johannesburg, Cape Town, Durban and Port Elizabeth) are targeted for the semi-structured interviews. The aim is to generate constructs for detailed design, pre-test and subsequent administration of questionnaires at the second stage among representative samples of clients and professionals involved in the building procurement process.

However, only few of the targeted clients have been interviewed at the time of writing this report. The bulk of the constructs used in the model development are generated from the review of literature and feedback from consultations with some client representatives and property investment and development consultants. The paper, therefore, presents a methodological discussion on a resource based conceptual development of the model, its subsequent application in the assessment of needs and priorities, and gauging of satisfaction levels at six distinct stages of the procurement process. The model will be more fully developed and validated using data generated at the end of the pilot survey and questionnaire administration stages.

Client needs assessment

To demonstrate the methodology for needs assessment proposed in this research, a case study of the needs and preferences of a commercial property investor client was carried out, during which the client was asked to recount his experiences in a recently

completed multi-million Rand retail shop in East London, South Africa. The motivational measurement method involving projective technique was used in a semi-structured interview session, to establish the client's latent needs and objectives for investing in the project. The client was first asked to list the latent objectives, which motivate clients generally to procure buildings. In posing such a generic question, it was assumed that the client's responses will reveal his latent objectives or motives for investing in the current project, which would not have elicited candid answers due to the confidentiality of such information, if the questioning were direct (Schiffman and Kanuk, 1978). However, in a situation where the client may be willing to reveal his latent objectives for investment, direct questioning could be used to augment the results of the motivational measurement (Runyon, 1980). The client was subsequently asked to prioritize the listed objectives i.e. to indicate the relative importance by assigning percentage values to the identified objectives in line with set priorities.

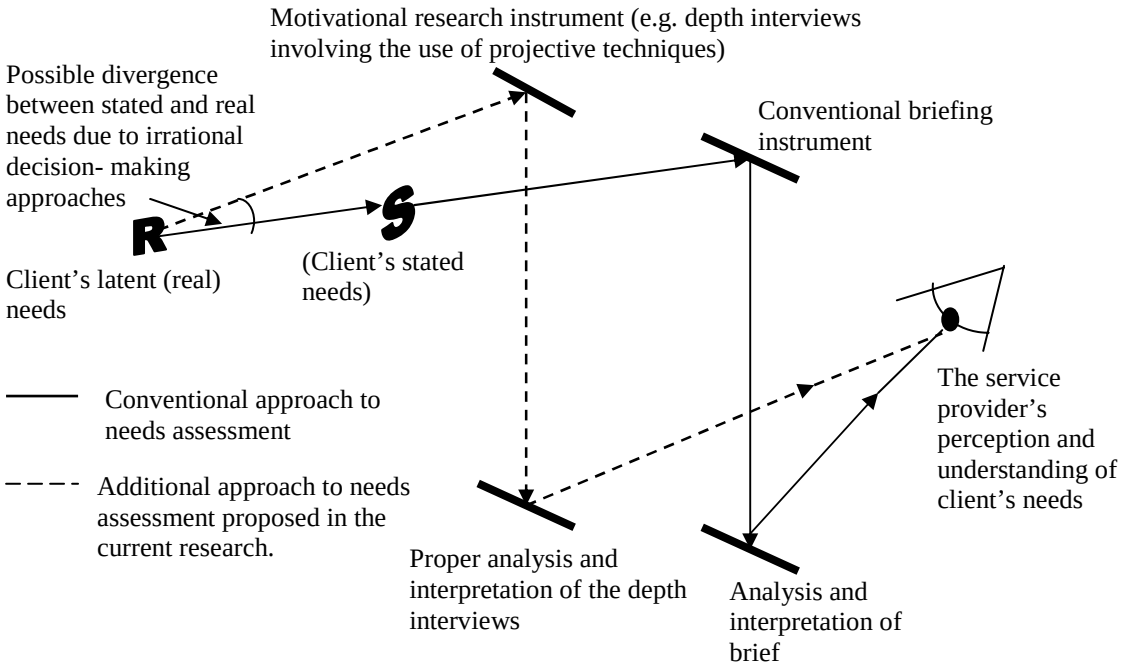

Figure 1: A model proposing improvement in needs assessment

At the second stage, the client was asked to state his requirements in the procurement process: the preferred procurement approach, detailed requirements in the service delivery (for costing, design, management and construction services) and the building features / performance characteristics (user/buyer requirements, functional performance / requirements and competitive attributes or perceived selling points of the completed project). Prioritizations of the requirements within a given set were also established by ranking.

The next stage proposed in the needs assessment process is the brainstorming session, which was meant for professionals in practice, and so was not applicable in the context of this study. However, there is a common consensus from the literature and expert opinions that the formation of a consortium or a nominal group for this purpose, involving architects, quantity surveyors, structural engineers and project/construction managers, in a collaborative alliance and independent of the client's initiative, could form a Delphi scenario during which the client's stated needs

and preferences, including the type of building project and procurement option demanded, are appraised for feasibility or appropriateness in the context of the established latent needs and objectives for investment. Optimal solutions could be suggested to the client in the event of any identified shortcomings. Normally, members of such a group should be those that will be nominated for the respective services. Figure 2 gives a schematic presentation of the suggested model of client needs assessment and satisfaction monitoring in the procurement process.

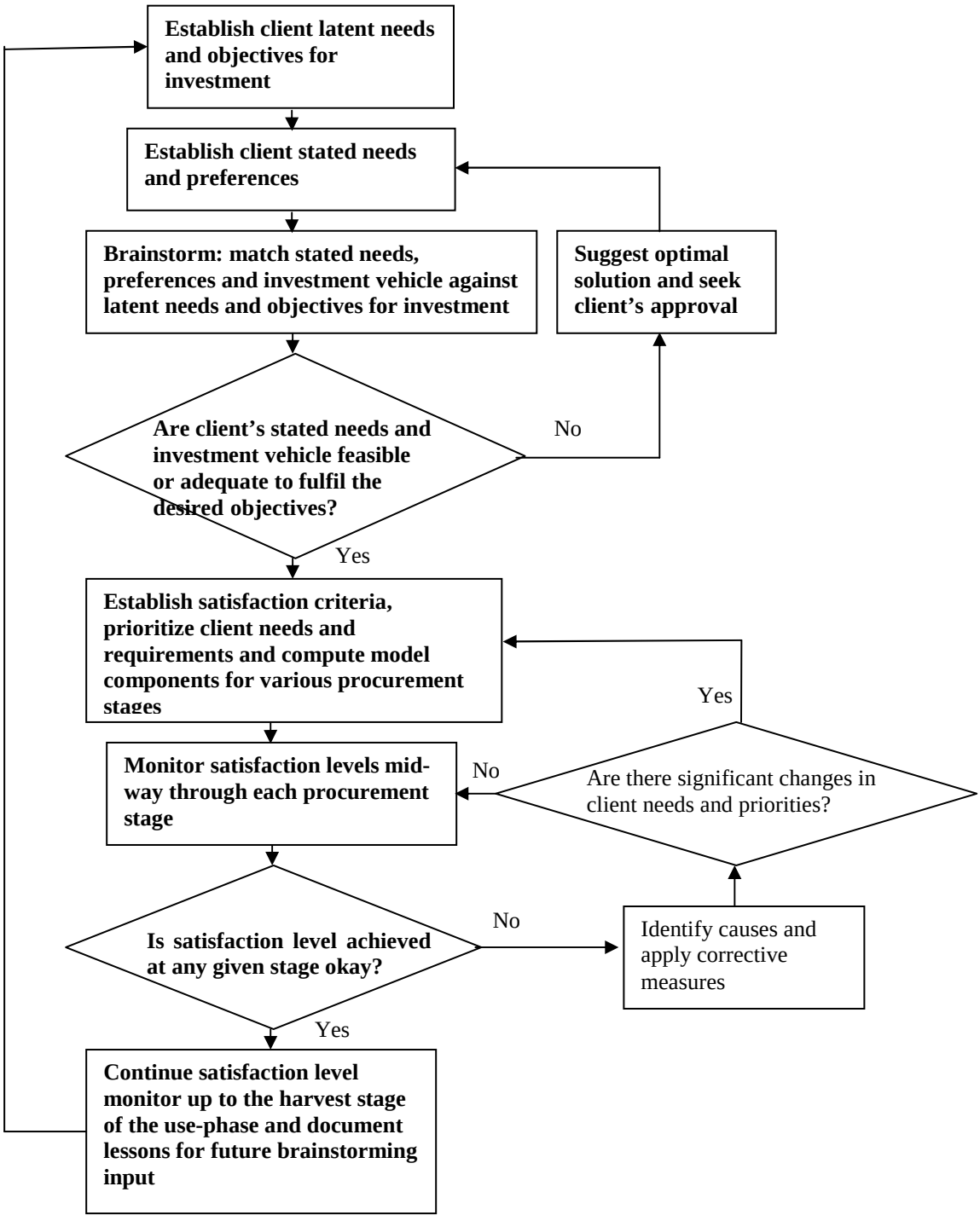

Figure 2: Suggested model of client needs assessment and satisfaction monitoring

The satisfaction model components

This study proposes that client's overall satisfaction (*S*) derived from the procurement outcome is composed of three major components: satisfaction from the procurement service (*Ss*), satisfaction with the building features/performance characteristics (*Sp*) and satisfaction with the investment outcome (*So*).

The general model is of the form:

$$S = A\sum_{i=1}^{M} a_i Ss_i + B\sum_{i=1}^{N} b_i Sp_i + C\sum_{i=1}^{K} C_i So_i$$

Where:

A, B, C are the relative weights (or relative importance) which add up to unity.

M, *N* and *K* are the total number of relevant attributes of the respective satisfaction components.

a_i, b_i and c_i are the relative weights of the sub-parameters in any given sub-set

At the sub-component level, the model decomposes as follows:

Procurement service satisfaction model:

$$\sum_{i=1}^{M} a_i Ss_i = A_c\sum_{i=1}^{Mc} a_{ci} Sc_i + A_d\sum_{i=1}^{Md} a_{di} Sd_i + A_m\sum_{i=1}^{Mm} a_{mi} Sm_i + A_s\sum_{i=1}^{Ms} a_{si} Ss_i$$

Where:

S_c = Satisfaction with the costing services, comprising the number of attributes (ranging from 1 to M) perceived by the client to be relevant in line with his priorities

S_d, S_m, S_s represent the satisfaction with the design, management and construction services respectively.

A_c, A_d, A_m and A_s are the relative weights assigned to the respective services in accordance with the client's perceived levels of importance attached to the service components in the satisfaction continuum.

b) Building features/performance characteristics satisfaction model:

$$\sum_{i=1}^{N} b_i Sp_i = B_u\sum_{i=1}^{Nu} b_{ui} S_{bui} + B_p\sum_{i=1}^{Np} b_{pi} S_{bpi} + B_c\sum_{i=1}^{Nc} b_{ci} S_{bci}$$

Where:

S_{bu}, S_{bp} and S_{bc} are satisfaction with user/buyer requirements (from the user/buyer's perceptions), satisfaction with the functional performance or features of the building in the use-phase, and satisfaction with the competitive attributes of the building in the market; respectively.

B_u, B_p and B_c are the relative weights of the three attributes as subsets of satisfaction with the building characteristics from the client's perspective

Transition stage satisfaction monitor

Using the above models, the client's satisfaction level at any stage of the procurement process (preferably mid-way through each defined stage) could be assessed, by asking the client to rate, from his perception, the performance on each significant attribute of

the operating component at the very stage involved. The rating is done on a six-point scale as follows: 1 = 'disgusted'; 2 = 'very dissatisfied'; 3 = 'dissatisfied'; 4 = 'just satisfied'; 5 = 'very satisfied'; 6 = 'delighted'. The rating score of the performance on each attribute is obtained by multiplying the rating with the relative weight of the attribute in the sub-set. A summation of the rating scores for each set of attributes gives the total satisfaction score obtained in respect of the given set (model sub-component). The entire satisfaction score for the operating model is obtained by summing the product of each set score and the relative weight of the set.

Table 1: Model development for the completion and handing over stage

	Relevant attributes of operating component	Rel wt*	Client's rating** (on a scale of 1-6)						Score = rel wt X rating
			Disgus (1)	VD (2)	Dissat (3)	Satisf (4)	VS (5)	Deli (6)	
A	Costing services (S_{ci})	0.06							
1	Accuracy of cost estimates	0.22					5		1.11
2	Timeliness	0.15				4			0.60
3	Comprehensiveness of cost information	0.19				4			0.74
4	Reasonable fee charge	0.07			3				0.22
5	Value for money	0.26				4			1.04
6	Adequacy of contingencies	0.11				4			0.44
	∑ (for costing services)	1.00							4.15
	Design services (S_{di})	0.5							
1	Design flexibility	0.139			3				0.417
2	Multi-purpose	0.056			3				0.167
3	Economy	0.167				4			0.667
4	Buildability	0.069					5		0.347
5	Timeliness	0.097			3				0.292
6	Comprehensiveness	0.083					5		0.417
7	Error-free detailing	0.111				4			0.444
8	Utility	0.153					5		0.764
9	Functionality	0.125					5		0.625
	∑ (for design services)	1.00							4.14

*'Rel wt' = 'Relative weight' of an attribute computed as: $R_i \Big/ \sum_{i=1}^{z} R_i$; where Ri = rank of an attribute 'I', amongst the set of 'Z' relevant attributes of the operating sub-component.

** 'Disgu' = 'Disgusted'; 'V.D' = Very dissatisfied'; 'Dissat' = 'Dissatisfied'; 'Satisf' = 'Just satisfied'; 'V S' = 'Very satisfied'; 'Deli' = 'Delighted'

	Relative attributes of operating component	Rel wt	Client's rating (on a scale of 1-6)						Score = rel wt X rating
			Disgu (1)	VD (2)	Dissat (3)	Satisf (4)	VS (5)	Del (6)	
A	Management (S_{mi})	0.1							
1	Technical competence	0.2			3				0.6
2	Value for money	0.229			3				0.689
3	Empathy and client's interests	0.143			3				0.429
4	Managerial competence	0.171				4			0.686
5	Unbiased professional advice	0.057			3				0.171
6	Guarantees	0.086			3				0.257
7	Risk avoidance	0.114				4			0.457
	∑ (management)	1.00							3.29

	Construction (S_{si})	0.34			
1	Compliance to specifications; zero defects	0.143	3		0.429
2	Guarantees	0.114	3		0.343
3	Technical competence	0.171		4	0.686
4	Compliance to statutes	0.057		4	0.229
5	Time, cost and quality targets	0.229	3		0.686
6	Value for money	0.2	3		0.6
7	Tolerance to changes by client.	0.086		4	0.343
	∑ (for construction services)	1.00			3.31

Transition stage satisfaction level score = (0.06*4.15)+(0.5*4.14)+(0.1*3.29)+(0.34*3.31) = 3.77
Satisfaction level achieved = 'Just satisfied'

Operating model: $0.06\sum_{i=1}^{6} a_{ci}S_{ci} + 0.5\sum_{i=1}^{9} a_{di}S_{di} + 0.1\sum_{i=1}^{7} a_{mi}S_{mi} + 0.34\sum_{i=1}^{7} a_{si}S_{si}$

Table 2: Snapshot assessment of overall satisfaction at the Harvest part

Overall satisfaction model					
1	Satisfaction with procurement service (S_s)	0.21		4	0.84
2	Satisfaction with building performance (S_b)	0.19	3		0.57
3	Satisfaction with investment outcomes (S_o)	0.6	3		1.8

Overall satisfaction model: $0.21S_s+0.19S_b+0.6S_o = 3.21$
Overall satisfaction level score = 0.84+0.57+1.8 = 3.21
Satisfaction level achieved = 'Dissatisfied'

Table 3: Summary of results

	Transition stage	Operating component	Sub-components	Satisfaction level achieved	Score obtained
1	Inception and outline design	Procurement services	Costing services	Just satisfied	
			Design services	Just satisfied	
			Overall	Just satisfied	4.28
Stage 1 operating model: $0.107\sum_{i=1}^{6} a_{ci}S_{ci} + 0.893\sum_{i=1}^{9} a_{di}S_{di}$					
2	Detailed design	Procurement services	Costing services	Just satisfied	
			Design services	Just satisfied	
			Overall	Just satisfied	4.14
Stage 2 operating model: $0.107\sum_{i=1}^{6} a_{ci}S_{ci} + 0.893\sum_{i=1}^{9} a_{di}S_{di}$					
3	Construction	Procurement services	Costing services	Just satisfied	3.83
			Design services	Just satisfied	
			Management services	Just satisfied	
			Construction services	Dissatisfied	

			Overall	Just satisfied	
Stage 3 operating model: $0.06\sum_{i=1}^{6} a_{ci}S_{ci} + 0.5\sum_{i=1}^{9} a_{di}S_{di} + 0.1\sum_{i=1}^{7} a_{mi}S_{mi} + 0.34\sum_{i=1}^{7} a_{di}S_{di}$					
4	Completion and handing over	Procurement services	Costing services	Just satisfied	
			Design services	Just satisfied	
			Management services	Dissatisfied	
			Construction services	Dissatisfied	
			Overall	Just satisfied	3.77
Stage 4 operating model: $0.06\sum_{i=1}^{6} a_{ci}S_{ci} + 0.5\sum_{i=1}^{9} a_{di}S_{di} + 0.1\sum_{i=1}^{7} a_{mi}S_{mi} + 0.34\sum_{i=1}^{7} a_{di}S_{di}$					
5	Inchoate part of use-phase	Building features/performance characteristics	User/buyer requirements	Just satisfied	
			Functional performance	Just satisfied	
			Competitive attributes	Dissatisfied	
			Overall	Just satisfied	3.77
Stage 5 operating model: $0.6\sum_{i=1}^{6} a_{ci}S_{ci} + 0.5\sum_{i=1}^{9} a_{di}S_{di} + 0.1\sum_{i=1}^{7} a_{mi}S_{mi} + 0.34\sum_{i=1}^{7} a_{di}S_{di}$					
6	Harvest part of the use-phase	Investment outcomes	Significant attributes	Dissatisfied	3.3
Stage 6 operating model: $0.6\sum_{i=1}^{6} a_{ci}S_{ci}$					

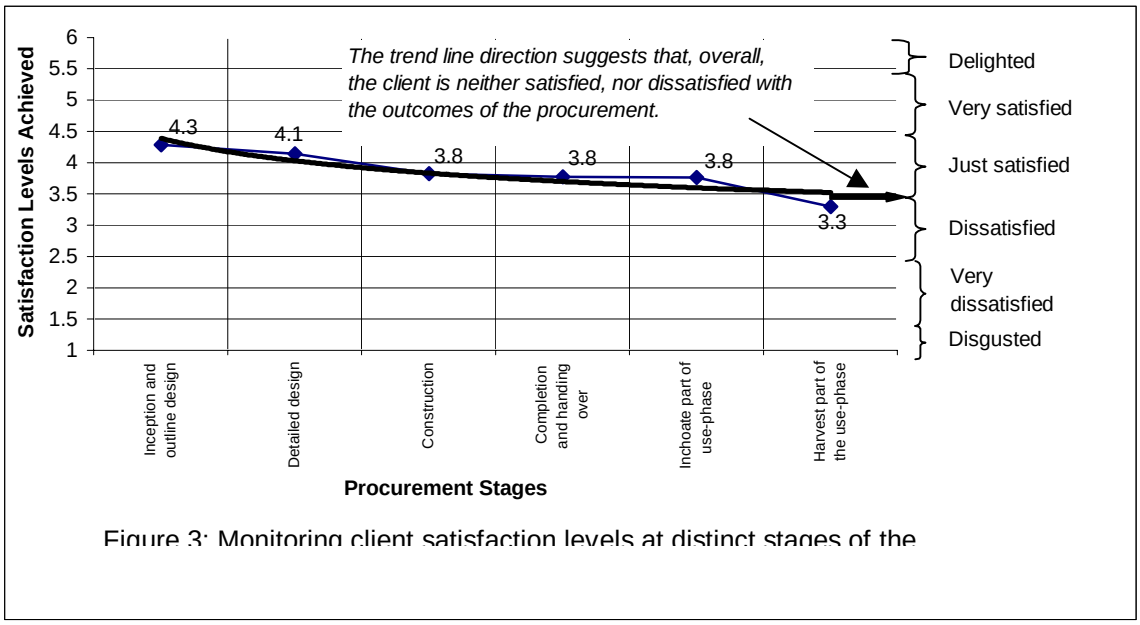

Figure 3: Monitoring client satisfaction levels at distinct stages of the

A graphical plot of the values obtained (as done in Figure 3) gives a visual representation of the satisfaction level achieved at any given stage, whereby an early corrective action could be taken in a situation of unsatisfactory performance. The

vertical scale of the plot shows six satisfaction score ranges for 'disgusted' (< 1.5); 'very dissatisfied' (1.5-2.49); 'dissatisfied' (2.5-3.49); 'just satisfied' (3.5-4.49); 'very satisfied' (4.5-5.5); and 'delighted' (> 5.5). The six procurement process stages are plotted on the horizontal axis. Table 1 shows an example of the model development for the completion and handing over stage'; Table 3 gives the summary of the results of the analysis for the entire six stages of the procurement process; while Table 2 shows a snapshot assessment of the overall satisfaction at the harvest part.

DISCUSSION OF RESULTS

The results of the model development for the needs assessment and satisfaction level monitor in the procurement process, using that of the completion and handing over stage as an illustrative example, is shown in Table 1. Table 3 presents the summary of the model development for all the six stages, ranging from the inception and outline design stage to the harvest part (realization of the investment objectives) of the use-phase. A retrospective assessment of the client's overall satisfaction in the procurement process could be done as illustrated in Table 2.

Results show that a significant difference exists between the overall satisfaction levels achieved using trend line analysis of the plots of all the stage satisfaction level scores, and the overall satisfaction level obtained in the retrospective assessment. The difference is deemed significant since it traverses two satisfaction level ranges: i.e. from 'just satisfied' (with a satisfaction level score of 3.5), to 'dissatisfied' (with a score of 3.3). This finding supports Handy and Ptaff's (1975) objection to an overall summary measure of satisfaction, as they argue that response to an overall satisfaction is only a crude measure; the reason being that the actual responses represent the consumer's immediate reaction to a complex situation, which may be in contrast to reality. However, since the client's perceptions of satisfaction levels at the end of the procurement process, whether crudely or objectively assessed, determine his re-purchase intentions, the perception at this stage is of prime importance. It could be argued that the client's perception of satisfaction at this stage could be greatly influenced by the extent to which the real objectives for investment are realized, irrespective of the satisfaction levels derived at the other stages of the procurement process. However, satisfaction with the procurement service could influence the client's intentions to re-commission the project team if the objectives for investments are realized; the latter issue being influential on re-investment intentions.

A cursory inspection of the plots of satisfaction levels at each stage of the procurement process shows a continuous downward trend as indicated by the direction of the trend line. An application of the model in real life would have alerted the project team about this unhealthy development at an early stage, thereby prompting an early corrective action, as suggested in Figure 2.

CONCLUSION

A model for needs assessment and satisfaction levels monitor in the procurement process has been proposed. An illustrative application of the model in a case study scenario demonstrated a fitness-for-purpose. However, the full development and a generic application of the model for validation purposes is an integral part of an on-going research.

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