CAUSES OF CLIENT DISSATISFACTION IN THE SOUTH AFRICAN BUILDING INDUSTRY AND WAYS OF IMPROVEMENT: THE CONTRACTORS' PERSPECTIVES

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DECLARATION

I declare that this research report is my own, unaided work. It is being submitted in partial fulfillment of the requirements for the degree of Master of Science in Building in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

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ABSTRACT

This research report sets out the results of investigations into the causes of client dissatisfaction in the South African building industry and ways of improvement, from the contractors' perspectives. The study is limited to the views of contractors who are registered with the Gauteng Master Builders Association (GMBA). The descriptive survey method was adopted in the study, which involved two stages of data gathering. At the first stage, semi-structured pilot interviews were conducted with a convenience sample of 18 directors and senior executives of construction companies within the target group. The data obtained from the exploratory surveys were subjected to cross-tabulation matrix analysis. Results showed that the most recurring factors underlying client dissatisfaction were late completion (medium sized contractor category), unrealistic construction programs imposed by clients (large sized contractor category) and poor quality of workmanship (combined/pooled category) at the end of the development phase; slow reaction time on part of contractor to attend to defects (medium sized, large sized and combined/pooled contractor categories) at the operation phase. Making use of a competent and reputable contractor was the most recurring strategy for improving client satisfaction. Correlation analysis was carried out to determine the extent of divergence or consensus in views of the two groups / categories of contractors targeted in the questionnaire survey. The results indicate significant correlation in the views of the contractor groups on the underlying causes of client dissatisfaction at the end of the development phase and at the operation phase. Significant correlation was also established in the views of the contractor groups on strategies for improving client satisfaction. Recommendations were made on ways of improving client satisfaction levels in the South African building industry based on the results obtained in the study. Areas requiring further research/investigation/exploration were also identified.

DEDICATION

I dedicate this report in the first instance to my wife, Lara, whose unwavering love, support, encouragement, and patience made it possible for me to pursue the completion of the research.

This report is also dedicated to my parents, brother, aunt, and granny for their love and support during my studies and who provided much needed injections of encouragement all the way through. I would like to thank my parents for their financial contribution towards my studies.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

The prevalence of client dissatisfaction in the building industry has been widely reported in the literature (Kometa *et al*., 1994; Bowen *et al*., 1997; Green and Lenard, 1999; Mbachu, 2003). Since current and future prospects in the construction industry depend largely on the extent of client satisfaction with the outcome of the building procurement process, client dissatisfaction poses a serious threat to the sustainability of the South African building industry. Given that investors have a very large range of investment opportunities besides building development, it is therefore crucial that service providers in the South African building industry should place a premium on client satisfaction, and develop their competitiveness, in order to attract prospective clients.

In the traditional procurement process that is popular in South Africa (Bowen, 1993), contractors' inputs are sought only after the needs of the building owner have been assessed and designed for. As a result of this, the opportunity to obtain the contractors' views and input in the appraisal and design processes is effectively lost at these initial and critical stages of the project. Another implication is that the project objectives of the building owner are not clearly understood by the contractor. For the building industry this is unfortunate as contractors have a wealth of knowledge and experience that could be drawn upon by building owners and professionals in developing and refining the brief, thereby setting realistic and achievable project objectives.

The fact that the views of the contractors are not taken into account at the initial stages of the building procurement process, while translating the building owner's brief into physical reality, could be partly responsible for the reported prevalence of client dissatisfaction in the building industry world-wide (Kometa *et al*., 1994; Bowen

et al., 1997; Green and Lenard, 1999; Mbachu, 2003). It could also be responsible for building owners' real (latent) needs not being adequately addressed and satisfied (Mbachu, 2003).

Dissatisfaction among building owners has negative implications for the South African building industry and its service providers. If the industry yields unsatisfactory returns, building owners may not be willing to continue investing in it. Investors choosing to invest in other sectors promising more satisfactory returns could result in a reduction in market share, profit levels and available jobs in the South African building industry.

Some other factors responsible for client dissatisfaction in the building industry have been identified in previous studies. For example, Nkado and Mbachu (2001) observe that the discrepancies between clients' latent and stated needs, and the consultants' concentration on the objective criteria (cost, time and quality) rather than seeing things from the clients' perspectives, are the key factors responsible for client dissatisfaction in the building industry. Also Green and Lenard (1999) see client dissatisfaction as resulting from the consultants focussing mainly on technical effectiveness rather than on the real objectives of the client for procurement. Further, Turner (1990) is of the view that the wrong choice of procurement route could lead to dissatisfactory outcomes, in spite of all the good efforts of the project team in the procurement process.

These studies have concentrated on reporting the topic from the clients' and consultants' perspectives. The real causes of client dissatisfaction, and possible strategies for improvement, could be identified by canvassing the views of the real implementers of the project (contractors). This is the premise underlying the need for this study.

1.2 NEED FOR THE STUDY

Contractors play a key role in the overall construction process in that they are

responsible for turning the interpretation of the client's brief (in the form of the building design) into a physical reality. As such, contractors contribute significantly to the success or failure of the construction process.

By canvassing the views of contractors in the South African building industry, the fundamental causes of client dissatisfaction if any, and ways of improvement, from the contractors' perspectives, could be identified. This will not only be beneficial to the key role-players in the industry, but also to the industry as a whole.

1.3 ANTICIPATED BENEFITS OF THE STUDY

Identifying the fundamental causes of client dissatisfaction is crucial to finding lasting solutions to the problem. Also contractors' views on suitable solutions to these problems could be articulated for implementation, resulting in benefits to clients, contractors, consultants and the building industry as a whole.

The implementation of the findings of the study in real life projects could result in a reduction in claims by contractors, minimisation of time and cost overruns, improvement in the quality of the finished product, and an improved relationship between employers and contractors. Improved synergy could also be achieved between the consultants and the contractor in terms of working towards and completing the project objectives successfully, and meeting or even exceeding client expectations.

1.4 STATEMENT OF THE PROBLEM

The problem under study is the prevailing spate of client dissatisfaction in the South African building industry and the implications thereof.

One of the envisaged causes of this problem is that the views of the key implementers / operators in the building development process (i.e. contractors) are not consulted and

taken on board in the design, planning and implementation of the project, especially at the initial and crucial stages. The contractor has a wealth of experience in construction methods, techniques and costs. His input "can often offer the benefit of construction experience, and a knowledge of the marketplace and labour force that the designer or the principal agent do not possess" (Fisk, 1997, p.372).

By virtue of this experience and knowledge contractors should have an insight into the optimum solutions to meeting building clients' needs and requirements, and delivering higher values.

This study is therefore aimed at investigating the causes of client dissatisfaction in the South African building industry and ways of improvement, from the contractors' perspectives.

1.5 OBJECTIVES OF THE STUDY

The key objectives of this study are as follows:

a. To identify priority factors underlying client dissatisfaction from the contractors' viewpoint.
b. To investigate ways of improving the levels of client satisfaction in the South African building industry.

1.6 PROPOSITIONS

The following propositions arise from the objectives of the study:

a. There is a consensus in the opinions of the large and medium contractor groups on the prioritization of the factors underlying client dissatisfaction.
b. Majority of contractors perceive that consulting and taking on board their views at the initial and critical stages of the building procurement process could significantly help in meeting the needs of the client and improve client satisfaction levels in the South African building industry.

1.7 SCOPE AND LIMITATIONS

This study is limited to the views expressed by contractors who are registered with the Gauteng Master Builders Association (GMBA) under the 'general contractors' and 'large contractors' categories as well as all Proprietary Limited companies under the 'general contractors' and 'small / medium contractors' categories. The GMBA's jurisdiction covers not only Gauteng Province, but also the North West Province, Mpumalanga Province and Limpopo Province.

A low response rate to the questionnaire survey could be a limitation to this study. For this reason census survey and concise and well-designed questionnaires were adopted to obtain favourable responses.

1.8 STRUCTURE OF THE REPORT

Chapter 1 provides an introduction to the report and sets out the background against which the research was carried out as well as the need for the study. It also describes the anticipated benefits of the study, the objectives of the study, and the scope and limitations of the study.

The review of related literature is reported on in Chapter 2. The literature review was carried out so that a better understanding of consumer satisfaction and dissatisfaction could be obtained. This provided a good theoretical framework within which to report on client dissatisfaction in the South African building industry. A review of literature related to different procurement options was also undertaken to put the South African building industry views in context. Insight was also gained into appropriate research methodologies and data analysis techniques.

Chapter 3 reports on the methodology employed in the study. The research method, sampling method, method of data gathering, and method of data analysis are presented for both the qualitative and quantitative phases of the study.

Quantitative data analysis is presented in Chapter 4. This chapter presents the results/findings of the questionnaire survey that was administered. Analyses of the results are carried out, commented on and conclusions drawn.

Chapter 5 is devoted to the testing of the two research propositions that arise from the objectives of the study. The proposition tests are used to determine the extent of divergence or consensus in views of the two groups / categories of contractors targeted in the questionnaire survey.

Chapter 6 is concerned with the conclusion of the study. Recommendations are made based on the key research findings. Potential areas for further investigation or research are identified.

Documents used in the administration of the questionnaire survey can be found in the appendices. The appendices also contain copies of the MS Excel spreadsheets used in the data analysis.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Client dissatisfaction in the construction industry has been extensively reported in literature (Kometa *et al*., 1994; Bowen *et al*., 1997; Green and Lenard, 1999; Mbachu, 2003). “So, in construction it is widely accepted that the commercial activity of companies within the industry tends to be adversarial, driven by the need to achieve the lowest prices through competitive tendering. A direct result of this is the prevalence of project disputes and a general air of conflict and even animosity between various stakeholders” (Hinks *et al.*, 1996, p. 226).

Preece and Moodley (1996, p. 308) point out that there is a need for organizations operating in the construction industry to develop “a positive public relations profile” in the face of “increased competition and ever more demanding and critical clients as well as more sophisticated clients”.

The growth and development of the construction industry is dependent on client satisfaction. It is client dissatisfaction that therefore poses the greatest threat to the future of the construction industry. Construction industry growth and prosperity can only be achieved if prospective clients are attracted by investment opportunities in the industry.

Relevant literature has been reviewed in order to set out the theoretical framework on which this study is based. The areas covered by this literature review are as follows:

- Customer needs, dissatisfaction, and the measurement of service quality and customer satisfaction.
- Causes of client dissatisfaction.
- Improving client satisfaction.

2.2 CUSTOMER NEEDS, DISSATISFACTION, AND THE MEASUREMENT OF SERVICE QUALITY AND CUSTOMER SATISFACTION

Band (1991, p. 80) defines customer satisfaction as being "the state in which customer needs, wants and expectations, through the transaction cycle, are met or exceeded, resulting in repurchase and continuing loyalty." Chakrapani (1998, p. 5) describes a customers wants and perception of quality as follows: "Quality, from customers' perspective, can be viewed as features that fulfill their wants in three basic psychological domains: cognitive, conative, and affective."
Needs, wants and expectations that are exceeded will lead to high customer satisfaction (Band, 1991).

For any organization, customer dissatisfaction can translate into loss of revenue (Band, 1991). In the construction industry, client satisfaction can potentially lead to repeat business. If, as a result of client dissatisfaction, repeat business is not secured, that potential future income stream may be lost. It is the responsibility and duty of all service providers in the construction industry to create value for its clients. Band (1991, p. 13) states that "If losing a customer means losing profits, keeping customers by delivering high-quality products and services is obviously good business."

Chakrapani (1998, p. 4) defines quality as "a product or service has quality if customers' enjoyment of it exceeds their perceived value of the money they paid for it." Construction client satisfaction is not exclusively dependent on the quality of the service offered, but also on the client's overall perception of the company providing the service (Band, 1991). Service providers in the construction industry must strive to deliver higher quality services and products by exceeding client expectations.

2.3 CAUSES OF CLIENT DISSATISFACTION

Barnes (1984) stresses that clients' objectives have not been the primary focus of building teams in the past and that this attitude needs to change in the future.

"Traditionally, design responsibility has lain almost entirely with the architect and other specialist design consultants such as the services engineer and structural engineer. This has led to a generally inadequate contribution of knowledge of construction methods, of buildability and of construction risks to the design process" (Barnes, 1984). The view taken in this study is that contractors have a wealth of knowledge and expertise in construction methods and buildability, and that it is the fact that their views are not taken on board at the initial critical stages of the construction project that is responsible for the prevalence of client dissatisfaction. Furthermore, the author of this study argues that involving contractors at the early stages of the project in order to obtain their input on constructability and buildability issues could lead to a better quality product and therefore improved client satisfaction. The findings of this study support that argument, particularly among the medium sized contractor category, where 68% of the total survey respondents indicated that including the contractor at the initial stages of the construction process in order to benefit from their expertise could be a very significant strategy for improving client satisfaction.

In their study, Nkado and Mbachu (2002) identify causes of client dissatisfaction in the South African building industry as well as ways of improving client satisfaction. The most important factors (and the relevant procurement phase) for client dissatisfaction were identified as occurring during the "harvest" part of the operation phase and were "the factors constraining the realization of the investment objectives." The authors also argue that client dissatisfaction in the harvest part of the operation phase could undermine satisfaction during the first two stages (end of the development phase and early part of the operation phase).

The contractor would only be involved during the first phase i.e. the development

phase and has no control over clients' satisfaction / dissatisfaction with the investment outcome of the project. It is this author's view that the realization of investment objectives is more a function of the critical decisions that the client makes upfront, for example, during the feasibility stage, in consultation with advisors.

In a study by Dulami *et al*. (1996, p. 193) it was found that only in one case did the design team make an attempt to understand the client's unique technical requirements. Furthermore the study indicated that professionals make very little effort to understand the perspective of the client. The study also highlighted the quite varied approach adopted by professional consultancy firms in dealing with and extracting information from the client. According to Dulami *et al*. (1996, p. 195), professionals tend to have differing orientation resulting in the production of "different solutions to the same requirements thus producing a misalignment with the real needs that the client has expressed." There is a reference here to the "real" needs of the client, implying that they are known. Mbachu (2003) found that clients' real (latent) needs do not necessarily get adequately / explicitly expressed or stated.

Dulami *et al*. (1996) claim that the inability of clients' needs to be fully understood and appropriately executed is primarily responsible for the widely reported dissatisfaction with and criticism of the construction industry. Furthermore, they maintain that appropriate methods should be developed to assist in capturing clients' needs and requirements more accurately.

The traditional procurement approach can often be characterized by conflict and disputes among participants. This is widely reported in the literature. Fragmentation has also been cited as a possible cause of the widespread discontent with the construction industry. This is illustrated in Dulami's *et al*. (1996, p. 195) study in which an attempt was only made once to bring all project participants (i.e. architects, project managers, client, quantity surveyors, engineers, and constructors) together physically into the same location in order to accelerate the communication process.

Rowlinson (1999) found that parties using the conventional project procurement model get frustrated as a result of the fact that information is reworked i.e. new

information is passed backwards, instead of the process being sequential where each participant's contribution flows sequentially through the project life cycle. **C**lients' sophistication and the technical complexity of buildings are such that the conventional (traditional) approach to procurement is inadequate (Rowlinson, 1999).

The traditional procurement process has been plagued by confrontation and conflict (Hinks *et al.*, 1996). This is a result of the usually complex and onerous contractual and legal framework by which parties are bound together as well as the competitive tendering process that is used to lower costs (Hinks *et al.*, 1996). As a result the various stakeholders (e.g. client, design-team, consultants, main contractor, sub-contractors, suppliers) are drawn into a dispute and conflict situation where each stakeholder is looking out for his own financial self-interest (Hinks *et al.*, 1996). This often leads to the final cost of the project exceeding the price initially agreed (Hinks *et al.*, 1996).

Taylor *et al*. (1999) suggest that the traditional procurement system stifles interaction between the client, the professional team, and the contractor. They also suggest that the traditional procurement system is out of date since it is based on the assumption that construction clients are uneducated about the intricacies of the construction industry. This is no longer the case, and as construction clients become increasingly aware of the way in which the industry operates, procurement systems need to adapt and become more flexible to allow for greater communication amongst the project participants.

Rowlinson (1999) reports on widespread dissatisfaction with traditional approaches to procurement (especially in terms of cost and time) as well as conflict between the various parties involved and that this had led to the rapid expansion of the use of design and build. The benefit of design and build in the context of this research is the closer integration of the design and construction teams, allowing contractors' views to be taken on board at the early stages of the project. Dulaimi and Dalziel (1994) in Rowlinson (1999) demonstrated that there was an increased level of synergy amongst project team members using the design and build approach.

"Contract claims have been shown to be a major cause of disputes on projects that also generate an environment of escalating mistrust, poor team relationships and client dissatisfaction" (Kumaraswamy, 1997b in Kumaraswamy and Walker, 1999, p. 232).

Variations have been identified as a major source of contractors' claims (Kumaraswamy and Walker, 1999, p. 242). An excessive number of claims by contractors could result in a dissatisfied client. Kumaraswamy and Walker (1999, p. 242) found that some variations could have been avoided and are often the result of "incomplete, inaccurate or ambiguous contract documents, be they bills of quantities, drawings, specifications or contract conditions."

The question of contractors being claims orientated was investigated in this study. Both categories of contractors rated this factor as not so significant in contributing to client dissatisfaction at the end of the development phase. This contradicts the theory found in the literature, and could be explained by the fact that contractors themselves were the respondents in this survey and were reluctant to admit that being claims orientated could contribute to client dissatisfaction.

With the widespread reported and documented dissatisfaction with the traditional (or conventional) approach to construction, other procurement methods are increasingly being explored and used. Harvey and Ashworth (1993: 120) in Taylor *et al*. (1999, p. 169) define procurement "as being that set of activities which commences with the establishment of client requirements and objectives and ends at project completion."

Harvey and Ashworth (1993: 120) in Taylor *et al*. (1999, pp. 169-171) show that flexible procurement systems (including flexibility in contractual, payment, and management procedures), in contrast to the conventional approaches, promote community participation including the transfer of critical capacity building skills resulting in employment creation and the upliftment of previously disadvantaged communities. This would appear to be particularly applicable in the context of the South African building industry where the transfer of skills to previously disadvantaged communities is critical to the industry's sustainability.

As reported in McDermott (1999), studies comparing the performance of different project procurement methods have shown that the more innovative methods e.g. management contracting, outperformed the traditional method when time was of the essence and when the project was highly complex. This supports the general theme of this study, that procurement methods that encourage early participation of the contractor in the construction process will deliver greater benefits to the overall outcome or success of the project for the client.

Rowlinson and Root (1997) in McDermott (1999) emphasize that the best way to achieve a smooth-running project is to develop a positive project culture even before a contract is let. The fragmentation in the conventional approach could be a barrier to the establishment of such a positive project culture.

Abdel-Meguid and Davidson (1996) in McDermott (1999) hypothesized that construction claims are the result of a poor choice of procurement strategy. Their findings indicated a link between use of the traditional procurement strategy and construction project delay claims. The traditional procurement strategy is one in which the contractor is not included at the initial stages of the construction process, which can lead to project delays ultimately resulting in client dissatisfaction.

Rowlinson (1999) found that clients often form an opinion as to the success (or failure) of the building procurement process during the operation phase.
Traditionally the architect takes the brief and advises on the appointment of other consultants, contractors and sub-contractors who rarely meet with the client. This may cause distortion of information flowing from the architect to the rest of the team. As a result other procurement systems have become popular e.g. design and build, construction management and management contracting. In these systems, construction team members other than the architect move closer to the client in an attempt to achieve greater project success. Another example of a procurement system becoming increasingly popular is partnering. Newcombe (1994) in Rowlinson (1999) states that the industry's key expectation of its clients is the decision to build, but also for continuity of work from a repeating client. Partnering allows the relationship between

the contractor and the client to be established, and then to be fostered and enhanced over an extended period of time, leading to the possibility of repeat business for the contractor. From the client's perspective, the advantage of such an arrangement is the chance to build a long-term relationship with the contractor facilitating communication and potentially leading to a better understanding by the contractor of the client's needs and objectives for that particular project. This could in turn lead to a more successful project resulting in a greater return on investment for the client and hence greater satisfaction.

The nature of the brief-taking process and the desire to deal with a single client representative are central to the construction industry's perception of the client. The industry wants a clear well-defined brief and a single client representative (Rowlinson, 1999). This is not the reality though because client organisations tend to be complex multi-organisations with many stakeholders and the brief tends to evolve. The same is true for clients who wish to have a single point of responsibility in the construction process. This has led to the rise in popularity of design and build procurement systems as they offer the client a single contact organisation covering design and construction phase (Rowlinson, 1999).

Some clients are knowledgeable about the construction process and some are not. Those that are not need guidance from construction professionals in order to translate their goals and objectives into reality (Latham, 1994, p. 11).

Latham (1994, pp. 11-12) points out that clients often judge the outcome of a construction project against a number of criteria, besides the wider objectives that the project is meant to fulfill, and that these criteria are often not met.

Clients' briefs to the designers frequently do not clearly communicate their needs and objectives. This can be addressed by the formulation of clear project strategies by clients (Latham, 1994, p. 13). Incomplete or sketchy briefs by clients to the professional team could lead to design and specification deficiencies resulting in project failures, and consequently dissatisfied clients. The results of this study reinforce Latham's (1994) assertion as respondents rated design and specification

deficiencies as a significant contributor to client dissatisfaction at the operation phase.

The results of this study indicate that contractors rated late completion and cost overruns as very significant factors in causing client dissatisfaction at the end of the development phase. Latham (1994, p. 18) maintains that the client should set aside sufficient time for the development of a comprehensive brief, which could overcome the problem of project time delays and cost overruns. This would appear to support the findings of this study. However, respondents in this study rated the allowance of adequate time during the pre-construction phase for the clear articulation of the client's requirements as only a moderately useful strategy for improving client satisfaction. This could be explained by the fact that contractors do not necessarily concern themselves with how much time the client allows for the articulation of its needs prior to commencement of the project. Respondents also rated the clear/concise articulation of the client's own needs and requirements by himself or his agent, and the proper/effective communication of these needs and requirements to the project team as a significant strategy for improving client satisfaction. This could indicate a concern contractors might have about the clarity with which the client's requirements and needs are communicated to other project participants.

The results of a study cited by Haksever *et al*. (1996, p. 243) confirm "that commercial factors are considered more important in the selection process reflecting the short-term and commercial driven attitude of the industry."

Clients sometimes regret appointing contractors based on price alone (Kumaraswamy and Walker, 1999, pp. 228-229). This practice could lead to claims for extra costs by contractors, and could result in disputes and poor performance levels by contractors. The question of "lowest tender syndrome" was tested in the questionnaire survey part of this study. The results indicate that it ranked reasonably highly among respondents as a possible underlying cause of client dissatisfaction at the end of the development phase. This finding, together with Kumaraswamy and Walker's (1999) assertion, would therefore suggest that there is consensus among contractors and clients on the issue of "lowest tender syndrome" i.e. both groups agree that the practice of appointing contractors based on price alone could lead to dissatisfactory project

outcome and should be avoided.

Kumaraswamy and Walker (1999, p. 234) list some innovative approaches to contractor selection. These approaches generally incorporate a range of considerations other than purely price criteria, substantiating the finding in this study that the so-called "lowest tender syndrome" could be responsible for client dissatisfaction at the end of the development phase.

Kumaraswamy and Walker (1999, p. 240) favour innovative approaches to contractor selection and maintain that clients' mindsets need to be shifted away from "the traditional and superficially economical one-dimensional cost-only criterion". This endorses the finding in this study i.e. that the medium and large sized contractors surveyed in this study rated the so-called "lowest tender syndrome" as quite significant in contributing to client dissatisfaction at the end of the development phase.

Amongst respondents in this study, the price driven selection of contractors ranked as a significant cause of client dissatisfaction. This finding is supported by Latham's (1994, p. 58) suggestion that clients often ignore the possibility that the final cost of a project may be significantly higher as a result of selecting contractors based on price only.

Dulami *et al*. (1996) found that clients have trouble visualizing what they are going to get and that therefore an attempt should be made to convey designs to clients in a way that can be understood by them. This could be achieved through the use of 3D (three-dimensional) models or 3D CAD (computer-aided design). One interviewee at the qualitative stage of this study also raised the question of clients' inability to visualize the construction end product resulting in unfulfilled expectations, supporting Dulami's *et al*. (1996) finding. This was tested during the survey phase of this study. The results indicate that the medium-sized group of contractors rated this factor as significant in contributing to client dissatisfaction, while the large-sized group of contractors rated this factor as not-so-significant in contributing to client dissatisfaction (see Table 6.1). The difference in the views of the two groups of

contractors could be explained by the fact that the clients of the medium-sized group of contractors tend to be less sophisticated than those of the large-sized contractors and therefore find it more difficult to visualize the end product of a construction project.

Clients' inability to visualize the end product resulting in unfulfilled expectations was rated by respondents in this study (particularly the medium-sized group of contractors) as a significant cause of client dissatisfaction at the end of the development phase. One, if not the, most important goals in any building/construction project is that the clients' objectives are fully met. This can only be achieved if the client fully understands the design proposals. It is the design leader's responsibility to ensure that the client becomes thoroughly familiar with the design (Latham, 1994, p. 25). Familiarizing the client with the design could reduce the possibility of clients being disappointed with the end product resulting in unfulfilled expectations.

Some of the criteria on which the industry judge the performance of clients include their ability to comprehend, and quickly act on, changes in design. (Rowlinson, 1999). It is the view of the author of this study that this could contribute to client dissatisfaction, because the uneducated / uninformed clients (i.e. those not familiar with the construction industry and its processes) are not knowledgeable and experienced enough to deal with situations that may arise that require their input or decisions promptly. Taking on board the contractors views at a much earlier stage of the construction procurement process could assist less sophisticated clients' understanding of the process because it would give such clients more time prior to construction to become familiar with the construction process and with the contractor's views and ideas. This could facilitate delivery of more successful construction projects and lead to improved client satisfaction.

Dulami *et al*. (1996, p. 193) conducted a study in which a number of architects, project managers and clients were interviewed to investigate and analyse, amongst other things, methods of collecting customer requirements. Relevant to this study is the fact that only in one instance did a project manager conduct a buildability audit whereby the needs of the contractor were taken into account. This involved

consultation with the contractor to determine whether the client's requirements could be met through the design, materials and construction techniques as specified by the professional team. It was found that designers were not provided with feedback on the information gained from the audits and therefore the opportunity to incorporate the contractor's suggested methodologies was lost, possibly resulting in an inferior end product and a dissatisfied client. The results of this study indicate that contractors rated the issue of buildability/constructability as not so significant in contributing to client dissatisfaction at the end of the construction phase (see Table 6.1). The disparity between the literature and the results of this study could be explained by contractors feeling that any indication of buildability/constructability contributing in any way to client dissatisfaction is an indictment on their performance as perceived by clients. Hence the survey respondents might have been reluctant to indicate that buildability/constructability could contribute to client dissatisfaction.

Edum-Fotwe *et al*. (1996, p. 43) showed, through the evaluation of the strategic focus of construction contractors' mission statements, that clients (customers) was one of several factors that receive little or no consideration in the formulation of contractors' strategic options. This could also contribute to client dissatisfaction. If client satisfaction could be incorporated into contracting companies' vision statements and strategic focus, or at least to a greater extent than might currently be the case, this could lead to the delivery of better quality construction projects and more client satisfaction.

2.4 IMPROVING CLIENT SATISFACTION

"Every client has the right to expect high quality from the project which it has commissioned. But unfortunately that is by no means always the outcome" (Latham, 1994, p. 78).
It is therefore crucial that construction management researchers and practitioners work together to improve client satisfaction.

Dulami's *et al*. (1996) study found that all design team members acknowledged that their goal was to achieve client satisfaction. Their study highlights possible advantages held by organizations that possess all the design disciplines within the same company. In the study design teams were forced to physically integrate by seating designers along side each other. The design team is led by a design team leader who is responsible for information flow to and from the client project manager. This process could result in better designs leading to improved construction quality and increased client satisfaction.

Haksever *et al*. (1996, p. 245) recommend that companies cooperate with each other in order to attain desired outcomes for their clients.

Green and Lenard (1999) described a project on which the contractor and the client had a very close working relationship and how they both benefited from it and learnt from each other. They further suggest benefits to the project owner, project contractor, project architect or engineer and other consultants as well as to the project subcontractors and suppliers where long term strategic alliances are developed / formed. These alliances or partnerships could mitigate or eliminate conflict between construction project participants. In contrast to their findings, respondents surveyed in this study did not rate personality clashes as a significant factor underlying client dissatisfaction at the end of the construction phase (refer tables 5.3, 5.4 and 5.5). The finding does not suggest that the construction industry in South Africa does not already benefit from such alliances or would not benefit from more partnering / alliances.

Dulami *et al*. (1996) point out that construction clients are becoming more demanding and more experienced in construction and their requirements / needs are not being adequately met. As a possible / potential strategy to address this, they introduce the concept of Quality Function Deployment (QFD). The Japanese "used Quality Function Deployment (QFD) to translate the customers requirements into designs which met the customers real needs" (Dulami *et al*., 1996, p. 188). The advantage of using QFD is that product definition or feasibility stages are lengthened, but length of / duration of design stage is decreased and re-design is almost entirely eliminated (Dulami *et al*., 1996, p. 189).

This concept would be appropriate in the construction industry, where a reduction in the length of the design stage could result in a decrease in the overall contract duration allowing earlier handover to the client. QFD would also be appropriate in the construction industry since an increase in the product definition phase would provide an opportunity to better understand the clients' needs as well as gain the views of the contractor on issues such as buildability and material specification, resulting in a more successful project outcome and improved client satisfaction. The process of QFD involves focusing on extracting the needs / requirements of the customer as stated by the customer. Increased satisfaction is achieved through the prioritization of requirements of greater importance to the customer (Dulami *et al*., 1996, p. 191). One of the pre-requisites for the implementation of QFD is "the collection of full, accurate and un-distorted customer requirements for each project" (Dulami *et al*., 1996, p. 196).

Murray *et al*. (1999) claim that there is evidence to suggest that clients are increasingly influencing the organizational design of project teams. Results of this study confirm that contractors are of the opinion that involving them at the initial critical stages of a project in order to obtain their input on how to meet clients' needs could lead to increased client satisfaction (see table 6.3). Clients themselves would welcome any increased satisfaction levels, and, if they are increasingly influencing the organizational design of project teams as is suggested by Murray *et al*. (1999), it would appear that involving contractors at the initial stages of a project would be

beneficial to clients based on the findings of this study.

Murray *et al*. (1999) stress that it is very important to construction clients that contractors make a concerted effort to understand the client's business operations and to also understand the reasons why the client is procuring a building. The authors cite the example of Tesco (a supermarket chain) that abandoned more traditional approaches of tendering every project in favour of getting contractors to familiarize themselves with Tesco's visions and values in order to establish continuity. This can only be achieved if contractors' views are obtained at the initial stages of a project, a strategy that respondents in this study rated as a significant potential contributor to the improvement of client satisfaction (refer table 6.3).

A form of partnering called the "cluster model or work-cluster method" put forward by Murray *et al*. (1999) allows for the early involvement of subcontractors in the design process of a project concerning buildability issues. The partnerships or "work clusters" are typically formed between designers, subcontractors and key suppliers involved in one particular area of the building project. Each cluster is responsible for total delivery of its element of the building project. This would in turn mean that main contractors would be required to set up similar partnerships with their key subcontractors and suppliers spanning more than just one project. This method strengthens/supports the finding of this study, that involving contractors at the early critical stages of construction projects [could significantly improve client satisfaction, as rated by respondents] was rated by respondents/(the project is rated) as a significant strategy in improving client satisfaction levels (by respondents surveyed).

Taylor *et al*. (1999, p. 169) emphasize the significance placed on the delivery/procurement process itself as distinct from/opposed to the end product by the government in South Africa. Factors/issues (e.g. affirmative action, sustainable employment creation and the development of public sector capacity to manage the delivery process) would have to be considered, not only the end product itself. This type of capacity building approach is important not only because of the additional employment opportunities it creates but also because the transfer of skills to previously disadvantaged communities ensures that the construction industry in South

Africa will remain sustainable. As client satisfaction is also influenced by the sustainability of the construction industry, the approach adopted by the South African government would appear to be designed for the benefit of all construction industry participants including clients.

Avoiding lowest tender syndrome was also put forward as a suggested strategy for improving client satisfaction and tested in the questionnaire survey part of this study. Respondents rated this strategy reasonably highly as one way in which to improve client satisfaction. Thus the successful selection of construction participants must be based on a demonstration to be able to perform well against broader definitions of project success than just capital cost (Kumaraswamy and Walker, 1999, p. 229).

Kumaraswamy and Walker (1999, p. 229) highlight the need for transparency of the selection process, as well as feedback mechanisms whereby unsuccessful tenderers can then address identified areas of weakness. This could over time lead to an increase in client satisfaction as a result of previously unsuccessful tenderers incorporating changes and improvements originating from the feedback described above. Clients and their advisers have up to now failed to adequately align the needs of the client / their needs with appropriately corresponding selection criteria (Kumaraswamy and Walker, 1999, p. 230). Pre-qualification should be seen as "a minimal first step" in establishing a contractor's credentials i.e. selection after pre-qualification should not be based on price alone/one shouldn't take the view that after pre-qualification you should then select based on price only (Kumaraswamy and Walker, 1999, p. 231). A contractor's organization can change between pre-qualification and contract award to the extent that that contractor might no longer be the right company for the job. Hence the importance of re-evaluating the contractor's status at the tender evaluation stage i.e. even after pre-qualification (Kumaraswamy and Walker, 1999, pp. 231-232).

A study by Holt *et al*. (1994) in Kumaraswamy and Walker (1999, p. 234) found that clients should have an interest in the expertise and the commercial viability of contractors that they use to realize their projects.

Strategies to avoid variations and therefore improve client satisfaction include improvements at the design documentation and contract management phase, as well as selecting contractors who have fewer tendencies to claim based on their past track records (Kumaraswamy and Walker, 1999, p. 242).

Improved construction time performance (CTP) can be achieved if the construction management team exhibits very high levels of planning skills and if they treat planning as a philosophy and not just a technique. Teamwork is also critical to achieving good CTP and this includes a good working relationship between the construction management team and the client representative, one in which efficient decision-making, and communication is encouraged (Kumaraswamy and Walker, 1999, p. 246).

The Latham Report identified adversarial relationships and industry fragmentation as the biggest barriers to improving productivity and quality in the construction industry. “If Latham’s recommendations for improving the Construction Industry are to be achieved, then it is necessary to develop better relations between clients, contractors, and suppliers” (Hinks *et al*, 1996, p. 220).

The development of long term relationships built on knowledge sharing and trust is a benefit of partnering (Hinks *et al*, 1996, p. 223). This is in contrast to the selfish philosophy/culture of the traditional system in which the contractor is concerned only with his own position. Hinks *et al*. (1996) cites Latham’s (1994) report in which Latham proposes that teamwork and partnering are the key solutions to the adversarial nature of the construction industry.

A client representative that is familiar with the construction project process could contribute to the client’s overall satisfaction. This view is supported by Walker (1996, p. 328), who states that “construction management performance is linked, and is probably assisted, by positive client representative sophistication and managerial effectiveness factors”.

Clients' needs directly impact their operations. Therefore engineering and construction firms should identify their clients' needs (Halpin and Huang, 1995).

Latham (1994, p. 11) remarks that by improving the industry's performance and teamwork, better value for money could be achieved for its clients. This could lead to improved client satisfaction.

The tactic of involving contractors at the initial and critical stages of a project, with the aim of obtaining their input on meeting the client's needs as a strategy for improving client satisfaction, was tested in this study. Respondents rated this strategy as significant in contributing towards increased client satisfaction. This result is corroborated by Latham's (1994, page 13) report, in which the benefit of involving all the parties involved in the construction process as early as possible is highlighted.

Latham (1994, p. 17) states that the traditional approach to construction is prone to a "lack of co-ordination between design and construction". Uncoordinated design and construction could lead to a dissatisfactory/inferior quality product resulting in a dissatisfied client. To solve this problem, contractors should be involved at the initial stages of the project. Contractors have the expertise and knowledge with respect to construction techniques, so their contribution in the early stages of the project process could lead to improved construction projects/better quality construction projects. This would significantly improve client satisfaction. Respondents in this study rated the involvement of contractors at the initial and critical stages of the project so as to obtain their input on how to meet clients' needs, as a significant potential contributor to the improvement of client satisfaction (see Table 6.3).

One of Latham's (1994, p. 19) most important/significant recommendations is that the client approving the design brief by signing it off should be part of the contractual process.

Latham (1994, p. 27) states that “throughout the process, the emphasis must be on meeting the client’s needs and keeping the client fully informed of potential risks.” He further stresses the importance of putting the client’s needs first.

Latham (1994, p. 36) expresses the view that construction contracts in which the main contractor and subcontractors are not involved in the design process do not reflect the reality of modern construction sites and therefore require revision/amendment/replacement. The finding of this study, that involving contractors at the early critical stages of construction projects could improve client satisfaction, supports Latham’s (1994) view.

Mitigation of disputes over costs of variations, by establishing the cost of potential variations ahead of time, is suggested as another strategy for minimizing client dissatisfaction (Latham, 1994, p. 36). Latham (1994, p. 59) further suggests that giving consideration to criteria such as the quality of previous work of the contractor, in addition to price, could reduce the occurrence of claims and disputes. Minimising clients’ aggravation by reducing the occurrence of claims and disputes could lead to increased client satisfaction.

Partnering i.e. the formation of teams that stay together for the long term thus creating synergistic (mutually beneficial) relationships, could contribute to increased client satisfaction as a result of cost reductions and performance/efficiency improvement (Latham, 1994, p. 62).

Latham (1994, p. 65) proposes that, through better working relationships between designers, contractors, subcontractors and manufacturers, design details and construction components could be standardized and more prefabrication could be achieved resulting in improved on-site performance and potentially greater client satisfaction.

Ron Baden Hellard (in Latham, 1994, p. 80) states that the “philosophy of teamwork and co-operation, not confrontation and conflict, is long overdue.”

CHAPTER 3: RESEARCH METHODOLOGY

3.1 RESEARCH METHOD

The descriptive survey method is adopted in the study because the method of data gathering is by the technique of observation through interviews and questionnaires (Zikmund, 1994).

3.2 METHOD OF DATA GATHERING

Two stages were undertaken as follows:

- Stage 1- Qualitative data-gathering:

  Semi-structured interviews were conducted with a convenience sample of 18 directors and senior executives of contracting firms in Johannesburg, with a view to generating constructs for the design of the questionnaires. Eight of the 18 interviews conducted fell into the large general contractor category and the remaining 10 fell into the medium general contractor category.

  The use of semi-structured interviews allowed the interviewer to exercise some control over the direction of the interview, allowing flexibility in engaging the interviewee.

  Members of the Gauteng Master Builders Association (GMBA) based in Johannesburg constituted the sampling frame for the pilot study.
- Stage 2 – Quantitative data-gathering:

  This involved a questionnaire survey of the target population of contractors who were registered members of the GMBA, excluding those who participated in the pilot interviews and questionnaire pre-testing.

3.3 SAMPLING METHOD

- Target Population

  The target population consisted of contractors who, at the time the questionnaire was administered, were registered with the Gauteng Master Builders Association

(GMBA) under the 'general contractors' and 'large contractors' categories as well as all Proprietary Limited companies under the 'general contractors' and 'small / medium contractors' categories.

- Sampling Technique

  A convenience sample (Zikmund, 1994) of 8 Managing Directors (MD's) or senior executives of 'large' general contracting companies and 10 MD's or senior executives of 'small / medium' general contracting companies were interviewed in the pilot surveys owing to the poor response rate in the industry (Nkado, 1999).

  Census surveys were carried out with the MD's or senior executives, who did not participate at the pilot survey stage, during the questionnaire stage of the study.

3.4 METHOD OF DATA ANALYSIS

Cross-tabulation and content analysis was used to analyse the data obtained from the pilot surveys for the purpose of identifying recurring themes or constructs mentioned or alluded to, by three or more interviewees.

The data obtained from the questionnaire surveys were subjected to multi-attribute analysis with a view to prioritising the identified factors within a given subset of factors.

Spearman's Rank Correlation Coefficient Test was used to compare the views of both large and medium sized contractors on the subject matter.

Multi-attribute analysis

The data obtained from the questionnaire surveys were analyzed using multi-attribute method. This involved computing the indices used for prioritizing the variables rated in any given set of variables. The indices are as follows:

The magnitude index (MI), whether significance index (SI) (for levels of significance), or impact index (II) (for levels of impact), reflect the respondents' combined ratings, on the five point rating scaled used, for each of the attributes in a given set. The MI for a given attribute or variable within a set is computed as follows:

$$MI = \sum_{i=1}^{5} (R_{pi} x R_{i\%}) \qquad (1)$$

(Where: R_{pi} = Rating point *i*, ranging from 1 – 5; $R_{i\%}$ = Percentage of the number of

respondents associating a rating point, *i*, to a given attribute in the subset).

The Relative Magnitude Index (RMI): Whether Relative Significance Index (RSI) or Relative Impact Index (RII) is used to compare the MI values of the variables in a given subset for ranking purposes. The RMI for a given attribute or variable, *i*, is computed as follows:

$$RMI_i = MI_i / [\sum_{i=1}^{n} MIi \,] \quad (2)$$

(Where: MI_i = Magnitude index for the *i*th variable; $\sum MI_i$ = Sum of all magnitude indices of the variables 1 – n, in a subset).

3.5 RESEARCH STRATEGY AND PROGRAMME

The first stage of the research involved the identification and clear definition of the problem to be investigated (the research problem) and the research objectives. A literature review related to the topic area was undertaken at this initial stage.

Pilot interviews were subsequently conducted once sufficient insight had been gained from the literature on the subject matter. The data gathered from these interviews was used as constructs for the design of the questionnaire.

Questionnaire surveys were used to gather quantitative data for analysis.

The final stage of the study included the quantitative data analysis, interpretation of results and statement of the conclusions drawn from the study. Recommendations for further research were made in the light of the research findings.

A flow chart illustrating the research process adopted is presented in Appendix 1 to this report.

3.6 PLANNING AND IMPLEMENTATION OF THE PILOT STUDY

The qualitative data gathering involved scheduling semi-structured pilot interviews with a convenience sample of 18 directors and senior executives of contracting firms in Johannesburg, with a view to generating constructs for the design of the

questionnaire that was used at the quantitative data gathering stage.

3.6.1 Target Population

The target population consists of contractors registered with the Gauteng Master Builders Association (GMBA) under the 'general contractors' and 'large contractors' categories as well as all Proprietary Limited companies under the 'general contractors' and 'small / medium contractors' categories.

3.6.2 Interview Strategy

Semi-structured interviews were used to generate constructs. These constructs formed the basis for the design of the questionnaire at the quantitative survey stage. The use of semi-structured interviews allowed the researcher to exercise some control over the direction of the interview. This facilitated the speedy collection of vital information within the constraints of scheduled interviews (Saunders *et al*., 1997).

3.6.3 Sampling Technique

Non-probability sampling method was adopted. A convenience sample (Zikmund, 1994; Leedy 1997) of 8 Managing Directors (MD's) or senior executives of 'large' general contracting companies and 10 MD's or senior executives of 'small / medium' general contracting companies were interviewed in the pilot surveys, owing to the poor response rate in the industry (Nkado, 1999). The convenience sampling technique was adopted as a result of the requirement to gain sufficient time for questioning of a sample of interviewees on the key issues in the study.

Census surveys were carried out with the MD's or senior executives, who did not participate at the pilot survey stage, during the questionnaire stage of the study.

3.6.4 Sample Size

There is no set rule for sample size when using the non-probability sampling approach (Saunders *et al*., 1997). The sample size in the pilot survey stage of the study was

largely determined by the granting of interviews by willing interviewees. Therefore the sample size was restricted to the 18 interviewees who granted the request for participation in the interviews.

3.6.5 Conduct of the interviews

Guidelines as set out in Saunders *et al*. (1997) were adhered to during the conduct of the interviews, particularly with respect to approach to questioning, and the avoidance of interviewer / interviewee bias.

3.7 PLANNING AND IMPLEMENTATION OF THE QUESTIONNAIRE SURVEY

3.7.1 Introduction

This section will describe the method used for implementation of the questionnaire survey of the target population of contractors. The questionnaire survey was carried out in order to test the validity of the constructs generated during the pilot survey, and to obtain data that could be generalized across the populations participating in the study.

There are two categories of respondents who were surveyed in this study, namely:

- Large sized contractors, defined for the purposes of this research as contractors who are registered with the Gauteng Master Builders Association (GMBA) under the 'general contractors' and 'large contractors' categories on the GMBA website.
- Medium sized contractors, defined for the purposes of this research as all Proprietary Limited companies under the 'general contractors' and 'small / medium contractors' categories on the GMBA website.

All the contractors surveyed were registered with the GMBA at the time the questionnaires were administered.

3.7.2 Sampling frame

The sampling frame is made up of contractors registered with the GMBA. Contractors who participated in the pilot interviews and questionnaire pre-tests were excluded from the questionnaire survey.

3.7.3 Sample size

At the quantitative data gathering stage the required sample size was met for the purpose of generalizations about the populations from which the samples were taken.

The methodology as set out in Saunders *et al.* (1997) was used to calculate the required sample size. The required sample size for the large contractor category was not calculated, as the total population in that category was 25. Ten contractors were used during the pilot interview and questionnaire pre-test stage, leaving 15 potential respondents for the main questionnaire stage. Thirteen questionnaires were sent out. A total of 11 responses were received of which 10 were usable.

The total population in the medium contractor category was 144. Twelve contractors were used during the pilot interview and questionnaire pre-test stage, leaving 132 potential respondents for the main questionnaire stage/ leaving a population of 132 from which an appropriate sample could be drawn. Seventy-six questionnaires were sent out. A total of 28 responses were received of which 26 were usable.

The minimum sample size for the medium contractor category was determined by interpolation from the values presented in Saunders *et al.* (1997, p. 156), which in this case yielded 98.

As suggested by Saunders *et al.* (1997) the adjusted minimum sample size was computed since the population was less than 10000. The following equation (Equation 3.1) was used to calculate the adjusted minimum sample size:

$$N` = \frac{N}{1+(\frac{N}{N_T})} \quad (3.1)$$

Where:

N` = adjusted minimum sample size

N = minimum sample size

N_T = total population.

In this case the following figures apply:

N = 98

N_T = 132

By substituting the values above into Equation 3.1 the adjusted minimum sample size yielded is 56.

The actual sample size required for a representation of the population as suggested by Saunders *et al.* (1997) is given by the following equation (Equation 3.2):

$$N^a = \frac{Nx100}{R_e\%} \quad (3.2)$$

Where:

N^a = sample size required

N = adjusted minimum sample size estimated using equation 3.1 above

R_e = estimated response rate expressed as a percentage.

The response rate of 25% achieved in a similar study by Nkado (1999) was used for the purposes of calculating the sample size required using Equation 3.2. In this case the following figures apply for the purposes of substitution:

N = 56

R_e = 25%

By substituting the values above into Equation 3.2 the required sample size yielded is 224.

In this case the computed required sample size (224) exceeds the total population/sampling frame (132). Therefore the sampling frame of 132 was used as the actual sample size required, as it was the lesser of the computed required sample size and the population/sampling frame. A total of 76 questionnaires were administered. However, a slightly better response rate was achieved than was expected. The expected response rate was 25% as achieved in a similar study by Nkado (1999). The actual response rate achieved in this study was 34%. An effective response rate of 40% was achieved for both contractor categories overall (i.e. for the study overall). The sample size is, however, considered sufficient for the purpose of generalizations about the population from which the sample was taken.

3.7.4 Target Population

The target population consists of contractors registered with the Gauteng Master Builders Association (GMBA) under the 'general contractors' and 'large contractors' categories as well as all Proprietary Limited companies under the 'general contractors' and 'small / medium contractors' categories.

3.7.5 Sampling Technique

Non-probability sampling method was adopted. Census surveys were carried out with the MD's or senior executives, who did not participate at the pilot survey stage, during the questionnaire stage of the study.

3.7.6 Research Questionnaire

3.7.6.1 Design

Semi-structured interviews were used to generate constructs. These constructs formed the basis for the design of the questionnaire at the quantitative survey stage.

The constructs generated as a result of the interviews formed the basis of a list of possible underlying causes of client dissatisfaction as well as possible strategies for improving client satisfaction. The questionnaire was used to obtain representative

views of the respondents on the levels of significance of each of these attributes towards causing client dissatisfaction, or improving client satisfaction, depending on the set of attributes being rated.

Nkado (1999) supports the use of Likert scale to measure opinions and therefore this method (five-point Likert rating scale) was adopted in the questionnaire as an instrument for measuring the respondents' ratings of the various attributes.

The questionnaire contained two main sections, the demographic background section and the main data section.

In the demographic section, the following information was obtained:

- Respondent companies' size category
- Respondent companies' area of specialization
- Length of respondent companies' active involvement in the South African building industry
- Length of respondents' personal active involvement in the South African building industry
- Respondents' personal highest formal educational qualification (this question was presented as optional)
- Respondents' personal status in their organization

The quality of the responses was assessed using the responses in the demographic section, and all responses from respondents that were categorized as being not usable were screened out.

In the main data section, responses were obtained on the following attributes:

- Levels of significance of possible causes of client dissatisfaction at the end of the development (construction) phase
- Levels of significance of possible causes of client dissatisfaction at the early part of the operation phase
- Levels of significance of possible causes of client dissatisfaction at the harvest part of the operation phase
- Levels of significance of possible strategies for improving client satisfaction

During the course of data analysis it was decided to combine the early part of the

operation (in-use) phase and the harvest part of the operation phase into one all-encompassing phase – the operation phase. This was done because it was felt that the views of the contractors would not be influenced by whether the factor being tested had occurred during the early part or the harvest part of the operation phase. This also meant that the analysis of the results was simplified. The questionnaire cover letter and questionnaire itself are included as Appendix 2 and Appendix 3 to this report.

3.7.6.2 Pre-test of the questionnaire

The questionnaire was pre-tested, as recommended by Leedy (1997) and Nkado (1999), by a convenience sample of contractors that did not participate in the pilot interviews. Two contractors from the medium sized category and two contractors from the large sized category were chosen for the purposes of questionnaire pre-test. The pre-test was conducted with senior management personnel of the contractors' organizations.

The draft questionnaire was administered to the four individuals referred to above via fax. They were asked to respond within a given timeframe, that timeframe being identical to the timeframe proposed for the administration of the final questionnaire. The respondents to the pre-test questionnaire were requested to comment freely on the clarity of the questions, possible ambiguity, length of the questionnaire, appropriateness, style, and interest in the topic being investigated. The feedback thus obtained was incorporated into the final questionnaire with a view to increasing the response rate.

3.7.6.3 Administration of the questionnaire

The final questionnaire was administered to contractors who did not participate in the pilot interviews or the questionnaire pre-test. The majority of the questionnaires were administered via fax, with a small number being administered via e-mail. The following documentation was included in the questionnaire pack at the time of administration:

- Covering letter personally addressed to a specific respondent. The letter summarized the purpose of the study and was designed to invoke in the respondent an interest in the topic being studied/investigated with a view to increasing response rate.
- Request form for a summary of the key findings. A copy of this form is attached as Appendix 4 to this report.

The respondents were given a reasonable amount of time in which to respond to the questionnaire. If no response had been received within that time a reminder letter was sent requesting them once again to respond. A copy of the reminder letter is presented in Appendix 5.

3.8 BIAS IN THE STUDY

Leedy (1997, p. 166) states: “Data in descriptive survey research are particularly susceptible to distortion through the introduction of bias into the research design. Particular attention should be given, therefore, to safeguarding the data from the influence of bias”. Leedy (1997, p. 167) further states as follows: “Bias for the researchers, like the presence of germs for the surgeon, is next to impossible to avoid. As researchers, we must learn to live with bias, but at the same time to guard against its infective destruction.”

Respondents in this study could have been disinclined to release sensitive information during the course of responding to the questionnaire, which could have led to bias in the study. The following steps were taken in an effort to minimize bias in the study:

- Covering letters were personally addressed to a specific respondent. The letter summarized the purpose of the study and was designed to invoke in the respondent an interest in the topic being studied/investigated with a view to increasing response rate.
- Questions in the questionnaire were phrased as succinctly as possible.
- Every effort was made to eliminate any ambiguity from the questions in the questionnaire.

- The questionnaire was kept to a manageable length in order to retain respondents' attention with the aim of increasing the response rate.

CHAPTER 4: QUANTITATIVE DATA ANALYSIS

4.1 INTRODUCTION

This section presents the results/findings of the questionnaire survey that was administered. Analyses of the results are carried out, commented on and conclusions drawn.

4.2 RESPONSE TO QUESTIONNAIRE

Eighty-nine questionnaires were administered in total. Seventy-six were sent to the medium sized contractor category and thirteen were sent to the large sized contractor category. Out of the eighty-nine questionnaires sent out in total, thirty-nine questionnaires were received back, of which thirty-six were found to be usable for the purposes of the analysis. Thus an effective response rate of forty percent was achieved. The details of the questionnaire response are set out in the table below.

Table 4.1: Tabular representation of questionnaire survey responses

Contractor category	No. of questionnaires sent	Responses received		
		No. received	Useful	% Response
Large	13	11	10	77
Medium	76	28	26	34
	89	39	36	40

4.3 CONTRACTORS' RESPONSES

For the purposes of this study contractors were classified as belonging to either a medium sized category or large sized category. This categorization is based on search/selection criteria available on the GMBA website. As can be seen from the demographic profiles presented below, analysis of the responses to Question A1 of the survey questionnaire reveals that contractors that were classified as belonging to

either of the two categories did not necessarily themselves agree with that classification. For example, 90% of the respondents in the large contractor category as defined by the GMBA classified themselves as being medium sized companies/organizations. Similarly, 4% of the respondents in the medium contractor category as defined by the GMBA classified themselves as being large companies/organizations, and 24% classified themselves as being small companies/organizations.

The analysis considers the responses of both categories of contractors separately as well as pooled together. This is done for the following reasons:

1. So that the levels of significance of the suggested factors and strategies that were being tested in the survey as indicated by each category of contractor could be compared with one another, as well as each category compared with the pooled responses.
2. So that the significance of the correlation between each category's ranking of the suggested factors and strategies could be tested, as well as the significance of the correlation between each category's ranking and that of the pooled response's ranking of the suggested factors and strategies could be tested.

Differences in the views of medium and large contractors could reflect the different issues and commercial realities faced by each as operating organizations in the South African building industry.

4.3.1 LARGE CONTRACTORS

The demographic profiles of the large contractor category are presented in the table below.

Table 4.2: Demographic profile of contractor respondents (large category)

% = Percentage of number of respondents in the category		
	Demographic question in questionnaire	%
	Total number of respondents	
A1	**Organisation's size:**	
	Large	0
	Medium	90
	Small	10

Table 4.2 continued:		%
	Total number of respondents	10
A2	**Organisations area(s) of specialization:**	
	Building construction	83
	Civil construction	17
	Mining construction	0
	Marine construction	0
	Process plant construction	0
	Other	0
	Total number of respondents	12
A3	**Duration of organisation's involvement in the South African building industry:**	
	< 5 yrs	0
	5 – 10 yrs	10
	11 – 15 yrs	0
	> 15 yrs	90
	Total number of respondents	10
B1	**Duration of respondent's personal involvement in the South African building industry:**	
	< 5 yrs	0
	5 – 10 yrs	10
	11 – 15 yrs	20
	> 15 yrs	70
	Total number of respondents	10
B2	**Respondent's highest formal educational qualification:**	
	High school certificate	10
	Diploma	10
	Higher National Diploma	0
	First degree	60
	Postgraduate diploma / certificate	0
	Postgraduate degree	20
	Other	0
	Total number of respondents	10
B3	**Respondent's organizational status:**	
	MD	30
	Director / senior executive	70
	Manager	0
	Senior staff	0
	Supervisor	0
	Trainee / intern	0
	Other	0
	Total number of respondents	10

The figures below graphically represent the demographic data described above.

Figure 4.1 - Categories of organisations to which respondents belonged

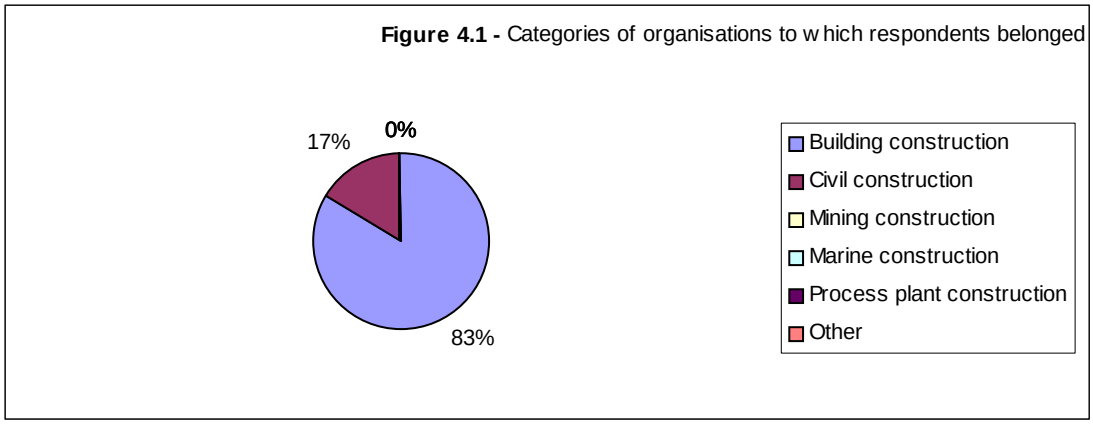


Figure 4.2 - Respondent organisations' length of active involvement in the South African building industry

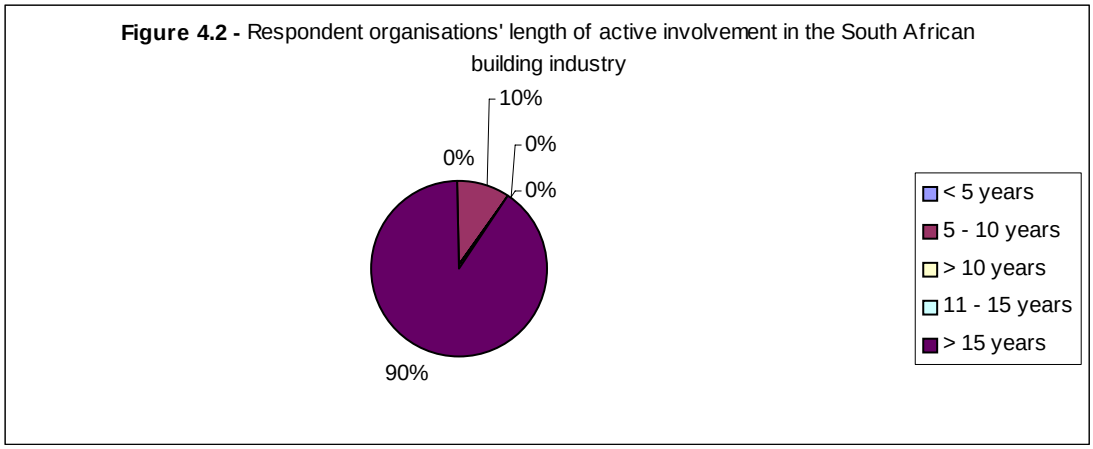


Figure 4.3 - Length of respondents' personal experience in dealing with the South African building industry

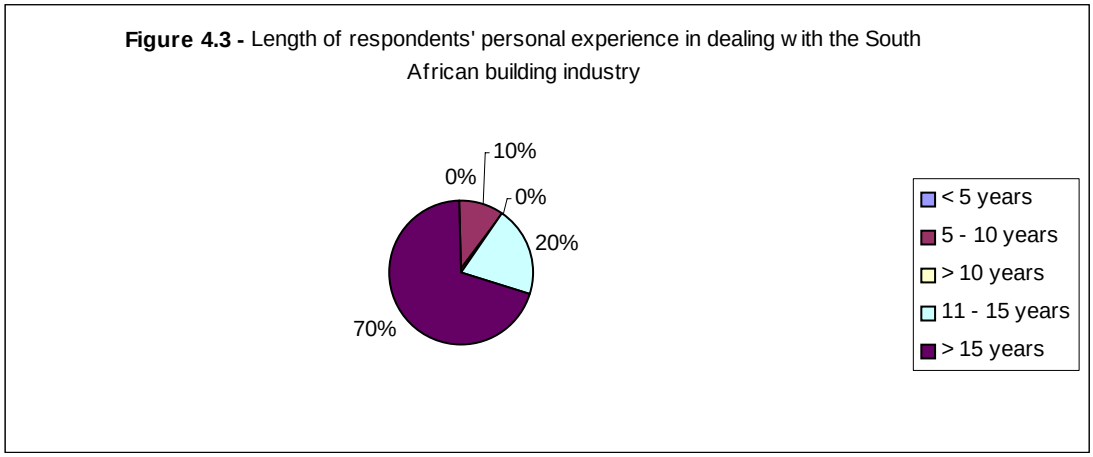
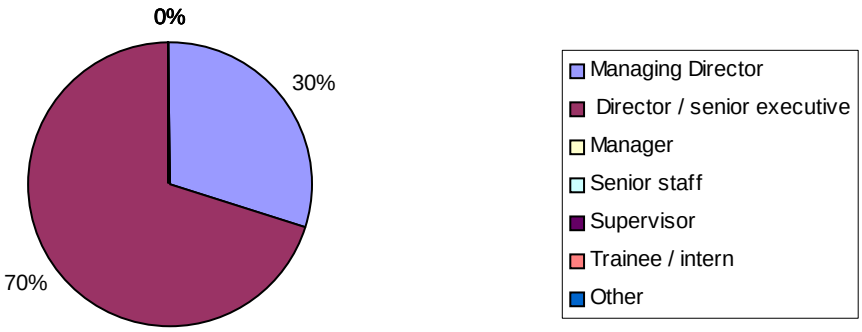


Figure 4.4 - Respondents' status in their organisations



4.3.2 MEDIUM CONTRACTORS

The demographic profiles of the medium contractor category are presented in the table below.

Table 4.3: Demographic profile of contractor respondents (medium category)

% = Percentage of number of respondents in the category		
	Demographic question in questionnaire	%
	Total number of respondents	
A1	**Organisation's size:**	
	Large	4
	Medium	72
	Small	24
	Total number of respondents	25
A2	**Organisations area(s) of specialization:**	
	Building construction	82
	Civil construction	9
	Mining construction	0
	Marine construction	0
	Process plant construction	0
	Other	9
	Total number of respondents	32
A3	**Duration of organisation's involvement in the South African building industry:**	
	< 5 yrs	8
	5 – 10 yrs	15

Table 4.3 continued		%
	> 10 yrs	8
	11 – 15 yrs	12
	> 15 yrs	57
	Total number of respondents	26
B1	**Duration of respondent's personal involvement in the South African building industry:**	
	< 5 yrs	4
	5 – 10 yrs	15
	> 10 yrs	12
	11 – 15 yrs	12
	> 15 yrs	57
	Total number of respondents	26
B2	**Respondent's highest formal educational qualification:**	
	High school certificate	15
	Diploma	18
	Higher National Diploma	12
	First degree	31
	Postgraduate diploma / certificate	12
	Postgraduate degree	12
	Other	0
	Total number of respondents	26
B3	**Respondent's organizational status:**	
	MD	61
	Director / senior executive	31
	Manager	8
	Senior staff	0
	Supervisor	0
	Trainee / intern	0
	Other	0
	Total number of respondents	26

The figures below graphically represent the demographic data described above.

Figure 4.5 - Categories of organisations to which respondents belonged

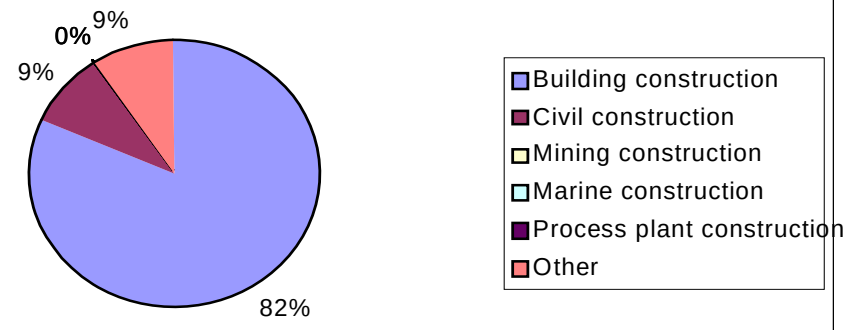


Figure 4.6 - Respondent organisations' length of active involvement in the South African building industry

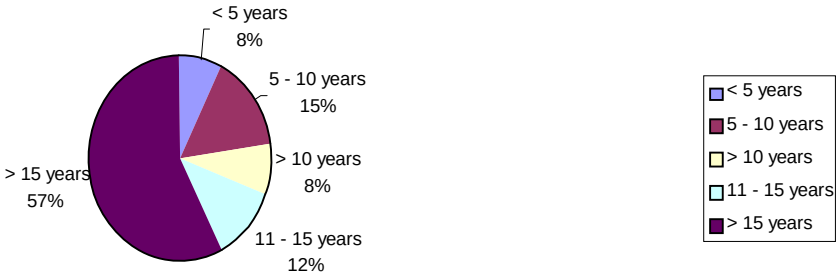
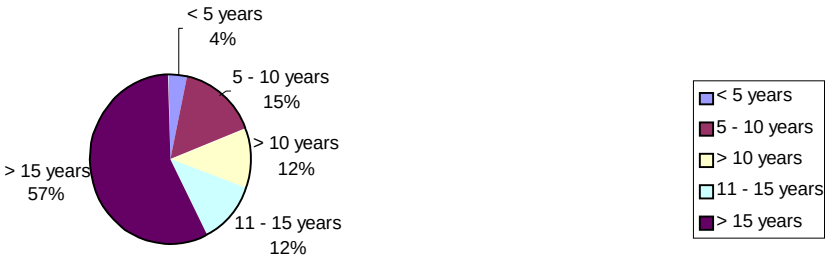


Figure 4.7 - Length of respondents' personal experience in dealing with the South African building industry



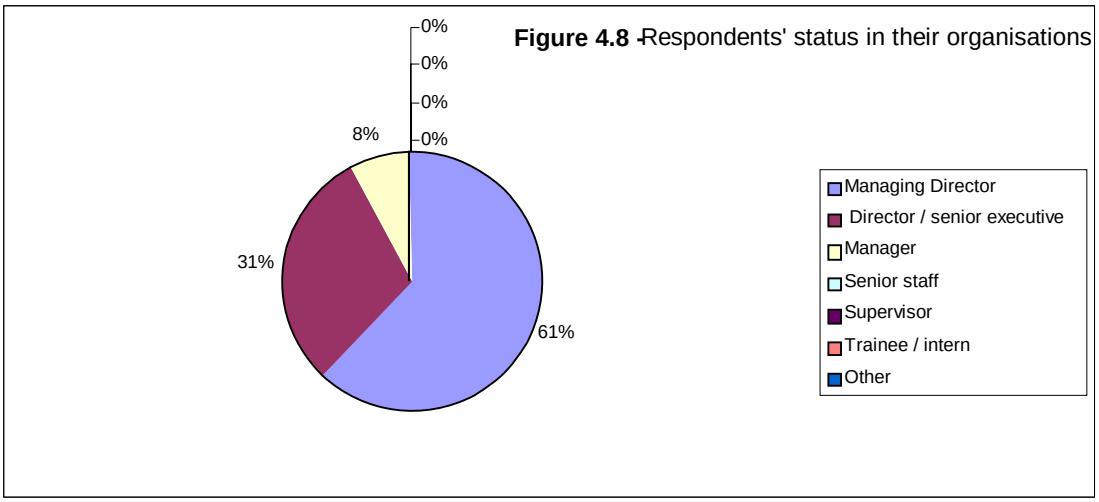


Figure 4.8 -Respondents' status in their organisations

Explanation of abbreviations used in the tables

The meanings of the abbreviations used in the following tables are as follows:

- Question: Refers to the corresponding question in the survey questionnaire.
- Factors: This refers to an identified possible/potential cause of client dissatisfaction or suggested strategy for improving client dissatisfaction.
- Levels of significance are defined as follows:
    - VS = Very significant
    - S = Significant
    - SS = Somewhat significant
    - LS = Of little significance
    - NS = Not significant
- TR: Represents the total number of respondents responding to a particular factor as presented in the questionnaire.
- MR: Refers to the mean rating calculated by summing the products of each rating point and the corresponding percentage response to each factor.
- RMR: This refers to the relative mean rating computed by dividing each factor's

- Rank: This is the importance of each factor ranked relative to all the other factors. A rank of 1 means that factor was calculated as being the most important relative to the others.

4.4 CAUSES OF CLIENT DISSATISFACTION AT THE END OF THE DEVELOPMENT (CONSTRUCTION) PHASE

An analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase is presented in the table below for the medium sized contractor category. The first objective of this study is addressed by prioritizing the underlying causes of client dissatisfaction as tested in the questionnaire survey. This is achieved by computing the ranks of the possible factors underlying client dissatisfaction.

The 'pooled' category of contractors' responses is the aggregation of the responses of the medium and large sized contractors. A comparison between the views of the medium and large size contractors with that of the combined or pooled category could highlight significant differences in opinion between the categories of contractors.

Table 4.4: Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase – medium

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.1	a	54	19	19	8	0	26	4.192	0.074	2
	b	54	27	12	8	0	26	4.269	0.075	1
	c	42	35	15	4	4	26	4.077	0.072	3
	d	50	23	8	19	0	26	4.038	0.071	4
	e	12	36	28	24	0	25	3.360	0.059	11
	f	40	20	20	20	0	25	3.800	0.067	6
	g	19	27	35	12	8	26	3.385	0.059	9
	h	23	27	38	8	4	26	3.577	0.063	7
	I	19	23	38	15	4	26	3.385	0.059	9
	j	4	4	50	31	12	26	2.577	0.045	15
	k	31	38	23	4	4	26	3.885	0.068	5

Table 4.4 continued:

	l	12	19	23	35	12	26	2.846	0.050	14
	m	20	28	24	16	12	25	3.280	0.058	12
	n	12	15	38	23	12	26	2.923	0.051	13
	o	4	0	19	35	42	26	1.885	0.033	17
	p	4	0	24	28	44	25	1.920	0.034	16
	q	19	42	12	23	4	26	3.500	0.062	8
								57	1	

Possible causes of client dissatisfaction at the end of the development (construction) phase:

a) Poor quality of workmanship; b) Late completion; c) Cost overruns; d) "Lowest tender syndrome" (price driven selection of contractor); e) Unsatisfactory service delivery by professionals; f) Unrealistic construction programs imposed by clients; g) Design flaws / defective design; h) Clients' inability to visualize end product resulting in unfulfilled expectations; i) Poor management and leadership by principal agents; j) Personality clashes / conflict impacting on progress and quality; k) Poor performance by contractor; l) The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor); m) Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors; n) Contractors being claims orientated; o) Breach of occupational health and safety regulations by contractor; p) Contractor not complying with environmental management requirements; q) Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress

An analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase is presented in the table below for the large sized contractor category. The factors were ranked in the same way as those for the table above.

Table 4.5: Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase - large

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.1	a	70	10	0	0	20	10	4.100	0.071	2
	b	50	10	30	10	0	10	4.000	0.070	4
	c	50	10	40	0	0	10	4.100	0.071	2
	d	40	20	20	20	0	10	3.800	0.066	8
	e	20	60	20	0	0	10	4.000	0.070	4
	f	20	80	0	0	0	10	4.200	0.073	1
	g	20	30	30	20	0	10	3.500	0.061	10
	h	30	20	20	20	10	10	3.400	0.059	11

Table 4.5 continued:

i	30	30	40	0	0	10	3.900	0.068	6
j	11	11	22	44	11	9	2.667	0.046	14
k	40	20	30	10	0	10	3.900	0.068	6
l	10	10	40	30	10	10	2.800	0.049	13
m	10	10	50	20	10	10	2.900	0.050	12
n	0	0	67	22	11	9	2.556	0.044	15
o	0	0	20	50	30	10	1.900	0.033	17
p	11	0	11	44	33	9	2.111	0.037	16
q	20	50	10	20	0	10	3.700	0.064	9
							58	1.000	

Possible causes of client dissatisfaction at the end of the development (construction) phase:

a) Poor quality of workmanship; b) Late completion; c) Cost overruns; d) "Lowest tender syndrome" (price driven selection of contractor); e) Unsatisfactory service delivery by professionals; f) Unrealistic construction programs imposed by clients; g) Design flaws / defective design; h) Clients' inability to visualize end product resulting in unfulfilled expectations; i) Poor management and leadership by principal agents; j) Personality clashes / conflict impacting on progress and quality; k) Poor performance by contractor; l) The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor); m) Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors; n) Contractors being claims orientated; o) Breach of occupational health and safety regulations by contractor; p) Contractor not complying with environmental management requirements; q) Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress

An analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase is presented in the table below for combined (pooled) medium and large sized contractors' responses. The factors were ranked in the same way as those for the table above.

Table 4.6: Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase - pooled

Question	Factors	MR Pooled	RMR	Rank
2.1	a	4.146	0.072	1
	b	4.135	0.072	2
	c	4.088	0.071	3
	d	3.919	0.068	5
	e	3.680	0.064	7
	f	4.000	0.070	4
	g	3.442	0.060	11

Table 4.6 continued:

h	3.488	0.061	10
i	3.642	0.064	8
j	2.622	0.046	15
k	3.892	0.068	6
l	2.823	0.049	13
m	3.090	0.054	12
n	2.739	0.048	14
o	1.892	0.033	17
p	2.016	0.035	16
q	3.600	0.063	9
	57	1.000	

Possible causes of client dissatisfaction at the end of the development (construction) phase:

a) Poor quality of workmanship; b) Late completion; c) Cost overruns; d) "Lowest tender syndrome" (price driven selection of contractor); e) Unsatisfactory service delivery by professionals; f) Unrealistic construction programs imposed by clients; g) Design flaws / defective design; h) Clients' inability to visualize end product resulting in unfulfilled expectations; i) Poor management and leadership by principal agents; j) Personality clashes / conflict impacting on progress and quality; k) Poor performance by contractor; l) The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor); m) Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors; n) Contractors being claims orientated; o) Breach of occupational health and safety regulations by contractor; p) Contractor not complying with environmental management requirements; q) Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress

4.5 CAUSES OF CLIENT DISSATISFACTION AT THE OPERATION PHASE

At the time the questionnaire survey was administered, the levels of significance of the factors underlying client dissatisfaction at both the early part of the operation phase as well as the harvest part of the operation phase was tested. However, it was decided that the results obtained from the responses to the questionnaire for these two separate phases of the operation phase would be combined into one resulting in the presentation and analysis of combined early part of the operation phase and harvest part of the operation phase, presented simply as the operation phase. The early part of the operation and the harvest part of the operation phase were combined into one phase, namely the operation phase, due to reason of simplification of analysis. Combining client interests or issues beyond the development (construction) phase into an all-encompassing phase – the operation phase eliminated the need to review and

analyse the needs and requirements of different client categories.

An analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase is presented in the table below for the medium sized contractor category. The factors were ranked in the same way as those for the table above.

Table 4.7: Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - medium

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.2 & 2.3										
(combined)	a	8	33	42	17	0	24	3.333	0.106	6
	b	32	36	18	6	8	25	3.780	0.120	2
	c	12	32	40	12	4	25	3.360	0.107	5
	d	21	29	17	17	17	24	3.208	0.102	9
	e	28	44	20	8	0	25	3.920	0.124	1
	f	13	35	27	17	8	24	3.271	0.104	8
	g	32	27	27	5	9	22	3.682	0.117	3
	h	33	29	19	10	10	21	3.667	0.116	4
	i	14	38	19	19	10	21	3.286	0.104	7
								31.507	1.000	

Possible causes of client dissatisfaction at the operation phase:

a) Manifestation of defects; b) Design and specification deficiencies; c) Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly; d) Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.); e) Slow reaction time on part of contractor to attend to defects; f) Lack of design flexibility (inability to adapt the building to clients' changing requirements); g) Client not achieving desired outcome or projected returns on investment; h) Property value depreciation and low occupancy levels due to poor site location; i) Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements

An analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase is presented in the table below for the large sized contractor category. The factors were ranked in the same way as those for the table above.

Table 4.8: Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - large

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.2 & 2.3										
(combined)	a	20	30	40	10	0	10	3.600	0.111	6
	b	16	47	26	11	0	9.5	3.684	0.113	4
	c	30	60	0	10	0	10	4.100	0.126	2
	d	20	30	20	20	10	10	3.300	0.102	7
	e	44	22	33	0	0	9	4.111	0.127	1
	f	11	17	56	17	0	9	3.222	0.099	8
	g	22	33	33	11	0	9	3.667	0.113	5
	h	22	56	0	22	0	9	3.778	0.116	3
	i	0	33	33	33	0	9	3.000	0.092	9
								32.462	1.000	

Possible causes of client dissatisfaction at the operation phase:

a) Manifestation of defects; b) Design and specification deficiencies; c) Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly; d) Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.); e) Slow reaction time on part of contractor to attend to defects; f) Lack of design flexibility (inability to adapt the building to clients' changing requirements); g) Client not achieving desired outcome or projected returns on investment; h) Property value depreciation and low occupancy levels due to poor site location; i) Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements

An analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase is presented in the table below for the pooled (combined medium and large sized) contractor category. The factors were ranked in the same way as those for the table above.

Table 4.9: Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - pooled

Question	Factors	MR Pooled	RMR	Rank
2.2 & 2.3				
(combined)	a	3.467	0.108	6

Table 4.9 continued:

b	3.732	0.117	2
c	3.730	0.117	3
d	3.254	0.102	7
e	4.016	0.126	1
f	3.247	0.102	8
g	3.674	0.115	5
h	3.722	0.116	4
i	3.143	0.098	9
	32	1.000	

Possible causes of client dissatisfaction at the operation phase:

a) Manifestation of defects; b) Design and specification deficiencies; c) Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly; d) Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.); e) Slow reaction time on part of contractor to attend to defects; f) Lack of design flexibility (inability to adapt the building to clients' changing requirements); g) Client not achieving desired outcome or projected returns on investment; h) Property value depreciation and low occupancy levels due to poor site location; i) Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements

4.6 STRATEGIES FOR IMPROVING CLIENT SATISFACTION

An analysis of the levels of significance of suggested strategies for improving client satisfaction for the medium sized contractor category is presented in the table below. The factors were ranked in the same way as those for the table above.

Table 4.10: Analysis of the levels of significance of suggested strategies for improving client satisfaction - medium

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.4	a	68	20	4	8	0	25	4.480	0.076	5
	b	17	26	48	4	4	23	3.478	0.059	13
	c	38	50	8	0	4	24	4.167	0.071	8
	d	84	8	8	0	0	25	4.760	0.081	2
	e	88	12	0	0	0	25	4.880	0.083	1
	f	76	24	0	0	0	25	4.760	0.081	2
	g	60	28	12	0	0	25	4.480	0.076	5
	h	8	28	44	20	0	25	3.240	0.055	14

Table 4.10 continued:

	i	28	52	12	4	4	25	3.960	0.067	11
	j	36	56	8	0	0	25	4.280	0.072	7
	k	32	48	20	0	0	25	4.120	0.070	10
	l	20	24	48	8	0	25	3.560	0.060	12
	m	40	40	16	4	0	25	4.160	0.070	9
	n	80	16	4	0	0	25	4.760	0.081	2
								59	1.000	

Strategies for improving client satisfaction:

a) Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs; b) Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options; c) Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning; d) Make use of a competent professional team; e) Make use of a competent and reputable contractor; f) Avoid lowest tender syndrome; selection should be based on contractors ability to deliver; g) Clients should set more realistic construction programs which could result in a better quality end product; h) Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.; i) Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service; j) Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team; k) Contractors should be more proactive in addressing problems on site; l) Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management; m) Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project; n) Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor

An analysis of the levels of significance of suggested strategies for improving client satisfaction for the large sized contractor category is presented in the table below. The factors were ranked in the same way as those for the table above.

Table 4.11: Analysis of the levels of significance of suggested strategies for improving client satisfaction – large

		Levels of significance								
		VS	S	SS	LS	NS				
Question	Factors	%	%	%	%	%	TR	MR	RMR	Rank
2.4	a	30	40	20	10	0	10	3.900	0.069	9
	b	10	40	40	10	0	10	3.500	0.062	12
	c	22	44	33	0	0	9	3.889	0.068	10
	d	70	20	10	0	0	10	4.600	0.081	3
	e	90	10	0	0	0	10	4.900	0.086	1
	f	40	60	0	0	0	10	4.400	0.077	5
	g	60	40	0	0	0	10	4.600	0.081	3

Table 4.11 continued:

h	0	30	40	30	0	10	3.000	0.053	14
i	40	30	30	0	0	10	4.100	0.072	7
j	30	50	20	0	0	10	4.100	0.072	7
k	11	67	22	0	0	9	3.889	0.068	10
l	10	30	30	30	0	10	3.200	0.056	13
m	33	44	22	0	0	9	4.111	0.072	6
n	70	30	0	0	0	10	4.700	0.083	2
							57	1.000	

Strategies for improving client satisfaction:

a) Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs; b) Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options; c) Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning; d) Make use of a competent professional team; e) Make use of a competent and reputable contractor; f) Avoid lowest tender syndrome; selection should be based on contractors ability to deliver; g) Clients should set more realistic construction programs which could result in a better quality end product; h) Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.; i) Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service; j) Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team; k) Contractors should be more proactive in addressing problems on site; l) Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management; m) Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project; n) Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor

An analysis of the levels of significance of suggested strategies for improving client satisfaction for the pooled (combined medium and large sized) contractor category is presented in the table below. The factors were ranked in the same way as those for the table above.

Table 4.12: Analysis of the levels of significance of suggested strategies for improving client satisfaction – pooled

Question	Factors	MR Pooled	RMR	Rank
2.4	a	4.19	0.072258	6
	b	3.48913	0.060171	12
	c	4.027778	0.06946	10
	d	4.68	0.080708	3
	e	4.89	0.084329	1
	f	4.58	0.078983	4

Table 4.12 continued:

g	4.54	0.078294	5
h	3.12	0.053805	14
i	4.03	0.069498	9
j	4.19	0.072258	6
k	4.004444	0.069058	11
l	3.38	0.058289	13
m	4.135556	0.071319	8
n	4.73	0.08157	2
	58	1.000	

Strategies for improving client satisfaction:

a) Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs; b) Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options; c) Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning; d) Make use of a competent professional team; e) Make use of a competent and reputable contractor; f) Avoid lowest tender syndrome; selection should be based on contractors ability to deliver; g) Clients should set more realistic construction programs which could result in a better quality end product; h) Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.; i) Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service; j) Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team; k) Contractors should be more proactive in addressing problems on site; l) Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management; m) Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project; n) Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor

CHAPTER 5: RESEARCH PROPOSITION TESTS

5.1 INTRODUCTION

This section presents the results/findings of the proposition tests. For the purposes of presenting this chapter effectively, the objectives of this study as well as the propositions arising from those objectives are repeated below.

The key objectives of this study are as follows:

a. To identify priority factors underlying client dissatisfaction from the contractors' viewpoint.
b. To investigate ways of improving the levels of client satisfaction in the South African building industry.

The following propositions arise from the objectives of the study:

a. There is a consensus in the opinions of the large and medium contractor groups on the prioritization of the factors underlying client dissatisfaction.
b. Majority of contractors perceive that consulting and taking on board their views at the initial and critical stages of the building procurement process could significantly help in meeting the needs of the client and improve client satisfaction levels in the South African building industry.

The proposition tests are used to determine the extent of divergence or consensus in views of the two groups / categories of contractors targeted in the questionnaire survey.

5.2 PROPOSITION 1

Testing of this proposition will reveal whether there is consensus or divergence in the

opinions of the two groups / categories of contractors on the prioritization of the factors underlying client dissatisfaction at the end of the development phase and at the operation phase.

Spearman's rank correlation coefficient method was employed to test the correlation between each contractor category's ranking of the causes of client dissatisfaction and the ranks calculated from the combined / pooled category's ratings.

The results of the Spearman rank correlation coefficient calculation are presented in Tables 6.1 and 6.2 below.

Note:

R	=	Spearman's rank correlation coefficient
R critical	=	Critical value of Spearman's rank correlation coefficient for a given number (n) of pairs of ranked factors at 0.05 level of significance.

Table 5.1: Rank Correlation - Causes of client dissatisfaction at the end of development (construction) phase

*Ranks: 1 = Cause perceived to be most significant by a group; All = All respondents: medium and large contractors; CCDD = Causes of client dissatisfaction at end of development phase (see details below); MR = Mean rating analysed from group's responses: 5 = Very significant; 4 = Significant; 3 = Somewhat significant; 2 = Of little significance; 1 = Not significant

*Ranks computed from groups' responses

	All contractors			Medium contractors			Large contractors		
	CCDD	MR	Rank	CCDD	MR	Rank	CCDD	MR	Rank
Significant factors: MR > 3.5	a	4.146	1	b	4.269	1	f	4.200	1
	b	4.135	2	a	4.192	2	a	4.100	2
	c	4.088	3	c	4.077	3	c	4.100	2
	f	4.000	4	d	4.038	4	b	4.000	4
	d	3.919	5	k	3.885	5	e	4.000	4
	k	3.892	6	f	3.800	6	i	3.900	6
	e	3.680	7	h	3.577	7	k	3.900	6
	i	3.642	8	q	3.500	8	d	3.800	8
	q	3.600	9	g	3.385	9	q	3.700	9
Not-so-significant factors: MR < 3.5	h	3.488	10	i	3.385	9	g	3.500	10
	g	3.442	11	e	3.360	11	h	3.400	11
	m	3.090	12	m	3.280	12	m	2.900	12
	l	2.823	13	n	2.923	13	l	2.800	13
	n	2.739	14	l	2.846	14	j	2.667	14
	j	2.622	15	j	2.577	15	n	2.556	15
	p	2.016	16	p	1.920	16	p	2.111	16
	o	1.892	17	o	1.885	17	o	1.900	17

Spearman rank correlation coefficient, R: Medium versus large contractors:	0.84		
Spearman rank correlation coefficient, R: Medium versus all contractors:		0.95	
Spearman rank correlation coefficient, R: Large versus all contractors:			0.95
R critical (R.05) (n = 17) (one-tailed test):	0.49	0.49	0.49
*Results:	SC	SC	SC

*Results: SC = Significantly correlated at 5% alpha if R > R.05; otherwise not significantly correlated (NSC)

Possible causes of client dissatisfaction at the end of development phase (CCDD):

a) Poor quality of workmanship; b) Late completion; c) Cost overruns; d) "Lowest tender syndrome" (price driven selection of contractor); e) Unsatisfactory service delivery by professionals; f) Unrealistic construction programs imposed by clients; g) Design flaws / defective design; h) Clients' inability to visualize end product resulting in unfulfilled expectations; i) Poor management and leadership by principal agents; j) Personality clashes / conflict impacting on progress and quality; k) Poor performance by contractor; l) The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor); m) Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors; n) Contractors being claims orientated; o) Breach of occupational health and safety regulations by contractor; p) Contractor not complying with environmental management requirements; q) Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress

A comparison of the prioritization of the medium and large sized contractor categories' views on the causes of client dissatisfaction at the end of the development (construction) phase demonstrates significant correlation. This indicates consensus in the views of both categories of contractors on the causes of client dissatisfaction at the end of the development (construction) phase. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the possible causes of client dissatisfaction at the end of the development (construction) phase.

The results of the Spearman's rank correlation coefficient test indicates that there is agreement between medium sized contractors' prioritization of the factors underlying client dissatisfaction at the end of the development phase and the prioritization of the same factors by the pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

Table 5.2: Rank Correlation - Causes of client dissatisfaction at the operation phase

*Ranks: 1 = Cause perceived to be most significant by a group; All = All respondents: medium and large contractors; CCDO = Causes of client dissatisfaction at end of development phase (see details below); MR = Mean rating analysed from group's responses: 5 = Very significant; 4 = Significant; 3 = Somewhat significant; 2 = Of little significance; 1 = Not significant

*Ranks computed from groups' responses

	All contractors			Medium contractors			Large contractors		
	CCDO	MR	Rank	CCDO	MR	Rank	CCDO	MR	Rank
Significant factors: MR > 3.5	e	4.016	1	e	3.920	1	e	4.111	1
	b	3.732	2	b	3.780	2	c	4.100	2
	c	3.730	3	g	3.682	3	h	3.778	3
	h	3.722	4	h	3.667	4	b	3.684	4
	g	3.674	5	c	3.360	5	g	3.667	5
Not-so-significant factors: MR < 3.5	a	3.467	6	a	3.333	6	a	3.600	6
	d	3.254	7	i	3.286	7	d	3.300	7
	f	3.247	8	f	3.271	8	f	3.222	8
	i	3.143	9	d	3.208	9	i	3.000	9
Spearman rank correlation coefficient, R: Medium versus large contractors:								0.78	
Spearman rank correlation coefficient, R: Medium versus all contractors:									0.87
Spearman rank correlation coefficient, R: Large versus all contractors:									0.95
R critical (R.05) (n = 9) (one-tailed test):								0.68	0.68	0.68
*Results:								SC	SC	SC

*Results: SC = Significantly correlated at 5% alpha if R > R.05; otherwise not significantly correlated (NSC)

Possible causes of client dissatisfaction at the operation phase (CCDO):

a) Manifestation of defects; b) Design and specification deficiencies; c) Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly; d) Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.); e) Slow reaction time on part of contractor to attend to defects; f) Lack of design flexibility (inability to adapt the building to clients' changing requirements); g) Client not achieving desired outcome or projected returns on investment; h) Property value depreciation and low occupancy levels due to poor site location; i) Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements

A comparison of the prioritization of the medium and large sized contractor categories' views on the causes of client dissatisfaction at the operation phase demonstrates significant correlation. This indicates consensus in the views of both categories of contractors on the causes of client dissatisfaction at the operation phase. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the possible causes of client dissatisfaction at the operation phase.

The results of the Spearman's rank correlation coefficient test indicate that there is agreement between medium sized contractors' prioritization of the factors underlying client dissatisfaction at the operation phase and the prioritization of the same factors by the pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

In conclusion, proposition 1 can be accepted on the basis that the results of the Spearman's rank correlation coefficient tests above point to significant correlation between the views of the medium and large sized contractor categories and those of the pooled category on the causes of client dissatisfaction at the end of the development phase and at the operation phase.

5.3 PROPOSITION 2

Testing of this proposition will reveal whether there is consensus or divergence in the opinions of the two groups / categories of contractors on the prioritization of the strategies for improving client satisfaction.

In particular, the ranking of strategy (a) - involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs – will be examined to determine whether the majority of contractors recognize this as a strategy that could significantly help in meeting the needs of the client and improving client satisfaction levels in the South African building industry.

Spearman's rank correlation coefficient method was employed to test the correlation between each contractor category's ranking of the strategies for improving client satisfaction and the ranks calculated from the combined / pooled category's ratings.

The results of the Spearman rank correlation coefficient calculation are presented in Table 5.3 below.

Note:

R = Spearman's rank correlation coefficient

R critical = Critical value of Spearman's rank correlation coefficient for a given number (n) of pairs of ranked factors at 0.05 level of significance.

Table 5.3: Rank Correlation – Strategies for improving client satisfaction levels

*Ranks: 1 = Cause perceived to be most significant by a group; All = All respondents: medium and large contractors; SICS = Strategies for improving client satisfaction levels (see details below); MR = Mean rating analysed from group's responses: 5 = Very significant; 4 = Significant; 3 = Somewhat significant; 2 = Of little significance; 1 = Not significant

*Ranks computed from groups' responses

	All contractors			Medium contractors			Large contractors		
	SICS	MR	Rank	SICS	MR	Rank	SICS	MR	Rank
Significant factors: MR > 3.5	e	4.890	1	e	4.880	1	e	4.900	1
	n	4.730	2	d	4.760	2	n	4.700	2
	d	4.680	3	f	4.760	2	d	4.600	3
	f	4.580	4	n	4.760	2	g	4.600	3
	g	4.540	5	a	4.480	5	f	4.400	5
	a	4.190	6	g	4.480	5	m	4.111	6
	j	4.190	6	j	4.280	7	i	4.100	7
	m	4.136	8	c	4.167	8	j	4.100	7
	i	4.030	9	m	4.160	9	a	3.900	9
	c	4.028	10	k	4.120	10	c	3.889	10
	k	4.004	11	i	3.960	11	k	3.889	10
Not-so-significant factors: MR < 3.5	b	3.489	12	l	3.560	12	b	3.500	12
	l	3.380	13	b	3.478	13	l	3.200	13
	h	3.120	14	h	3.240	14	h	3.000	14
Spearman rank correlation coefficient, R: Medium versus large contractors:								0.88	
Spearman rank correlation coefficient, R: Medium versus all contractors:									0.96
Spearman rank correlation coefficient, R: Large versus all contractors:									0.95
R critical (R.05) (n = 14) (one-tailed test):								0.54	0.54	0.54
*Results:								SC	SC	SC

*Results: SC = Significantly correlated at 5% alpha if R > R.05; otherwise not significantly correlated (NSC)

Possible strategies for improving client satisfaction levels (SICS):

a) Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs; b) Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options; c) Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning; d) Make use of a competent professional team; e) Make use of a competent and reputable contractor; f) Avoid lowest tender syndrome; selection should be based on contractors ability to deliver; g) Clients should set more realistic construction programs which could result in a better quality end product; h) Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.; i) Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service; j) Client and his agents should articulate

needs and requirements properly and communicate these effectively to the project team; k) Contractors should be more proactive in addressing problems on site; l) Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management; m) Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project; n) Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor

A comparison of the prioritization of the medium and large sized contractor categories' views on the strategies for improving client satisfaction levels demonstrates significant correlation. This indicates consensus in the views of both categories of contractors on the ways in which client satisfaction may be improved. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the suggested strategies for improving client satisfaction levels.

The results of the Spearman's rank correlation coefficient test indicate that there is consensus between medium sized contractors' prioritization of the strategies for improving client satisfaction and the prioritization of the same strategies by the pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

In conclusion, proposition 2 can be accepted on the basis that the result of the Spearman's rank correlation coefficient test above points to significant correlation between the views of the medium and large sized contractor categories and those of the pooled category on the strategies for improving client satisfaction.

The results of the rank correlation test above indicate that involving the contractor at the initial and critical stages of the project to obtain their input on how to meet clients' needs was rated as a significant strategy for improving client satisfaction by both groups of contractors, as well as the combined category.

CHAPTER 6: CONCLUSIONS

6.1 INTRODUCTION

This study was undertaken to determine the causes of client dissatisfaction in the South African building industry and ways of improvement from the contractors' perspective. Specifically, the key objectives of the study were as follows:

a. To identify priority factors underlying client dissatisfaction from the contractors' viewpoint.
b. To investigate ways of improving the levels of client satisfaction in the South African building industry.

The objectives of the study gave rise to the following propositions:

a. There is a consensus in the opinions of the large and medium contractor groups on the prioritization of the factors underlying client dissatisfaction.
b. Majority of contractors perceive that consulting and taking on board their views at the initial and critical stages of the building procurement process could significantly help in meeting the needs of the client and improve client satisfaction levels in the South African building industry.

These propositions formed the basis of the investigation and determined the type of data to be collected and the method chosen to analyse the data. The descriptive survey method was adopted in the study because the method of data gathering was by the technique of observation through interviews and questionnaires (Zikmund, 1994).

Data were collected in two stages, namely the qualitative stage and then the quantitative stage. During the qualitative data gathering stage, semi-structured interviews were conducted with a view to generating constructs for the design of the questionnaires that were administered during the quantitative data gathering stage.

Chapter 4 contains the quantitative data presentation and analysis. The data obtained from the questionnaire surveys were subjected to multi-attribute analysis with a view to prioritising the identified factors underlying client dissatisfaction as well as

prioritising ways of improving the levels of client satisfaction in the South African building industry. The proposition tests were used to determine the extent of divergence or consensus in views of the two groups / categories of contractors targeted in the descriptive questionnaire survey using correlation analysis. Key research findings are presented in the following section.

6.2 RESEARCH FINDINGS

Prioritisation of factors underlying client dissatisfaction from the contractors' viewpoint

There were two categories of respondents who were surveyed in this study, namely:

- Large sized contractors.
- Medium sized contractors.

The large and medium sized contractors were combined to form a pooled category. This was done because the threshold defining medium sized firms is fluid. Collapsing the three-class continuum into two makes the emphasis more meaningful i.e. the small firms, and the well-established firms. It also assists in reducing the complexity of the analysis. All the contractors surveyed were registered with the Gauteng Master Builders Association (GMBA) at the time the questionnaires were administered.

The possible underlying factors leading to client dissatisfaction were subjected to testing at two different stages of the procurement process, namely the end of the development (construction) phase and the operation phase.

Multi-attribute analysis was carried out to rank the factors underlying client dissatisfaction and thus prioritise them. The results of the analysis show that the medium sized group of contractors rated late completion as the most significant factor underlying client dissatisfaction at the end of the development (construction) phase. The large sized group of contractors rated unrealistic construction timeframes imposed by clients as the most significant factor underlying client dissatisfaction at the end of the development (construction) phase. The results of the pooled category

(i.e. medium and large sized contractors together) indicate that poor quality of workmanship ranked as the most significant factor underlying client dissatisfaction and the end of the development (construction) phase.

Results of the analysis show that the medium sized group of contractors rated slow reaction time on part of contractor to attend to defects as the most significant factor underlying client dissatisfaction at the operation phase. The large sized group of contractors, as well as the pooled category, also ranked slow reaction time on the part of the contractor to attend to defects as the most significant factor underlying client dissatisfaction at the operation phase.

Prioritisation of suggested strategies for improving client satisfaction in the South African building industry from the contractors' perspective

The same categories of contractors as above apply in the analysis of the levels of significance of suggested strategies for improving client satisfaction. Again multi-attribute analysis was carried out to rank the suggested strategies and thus prioritise them. The results of the analysis show that the medium and large sized group of contractors, as well as the pooled category, all rated making use of a competent and reputable contractor as the most significant strategy for improving client satisfaction.

Proposition 1 - Determination of consensus or divergence in the opinions of the large and medium sized contractor groups on the prioritization of the factors underlying client dissatisfaction

The proposition tests were used to determine the extent of divergence or consensus in views of the two groups / categories of contractors (i.e. large and medium sized) targeted in the descriptive survey on the prioritisation of the factors underlying client dissatisfaction at the end of the development (construction) phase and at the operation phase. Correlation analysis was used to calculate the significance of the consensus or divergence in the views of the two groups of contractors.

The results show significant correlation in the views of both categories of contractors

on the causes of client dissatisfaction at the end of the development (construction) phase. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the possible causes of client dissatisfaction at the end of the development (construction) phase. The strength of the correlation in the views of the two groups of contractors is very significant and should therefore be interpreted by the industry as an accurate and true reflection of their views.

The results also show that there is agreement between the medium sized contractors' prioritization of the factors underlying client dissatisfaction at the end of the development phase and the prioritization of the same factors by the pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

A comparison of the prioritization of the medium and large sized contractor categories' views on the causes of client dissatisfaction at the operation phase also demonstrates significant correlation. This indicates consensus in the views of both categories of contractors on the causes of client dissatisfaction at the operation phase. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the possible causes of client dissatisfaction at the operation phase. Once again, this is a significant result for the industry that should interpret the strong correlation in the views of the two groups of contractors on the underlying causes of client dissatisfaction at the operation phase as an accurate and true reflection of their views.

The results of the rank correlation test also indicate that there is agreement between medium sized contractors' prioritization of the factors underlying client dissatisfaction at the operation phase and the prioritization of the same factors by the pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

In conclusion, Proposition 1 can be accepted on the basis that the results of the Spearman's rank correlation coefficient tests point to significant correlation between the views of the medium and large sized contractor categories and those of the pooled

category on the causes of client dissatisfaction at the end of the development phase and at the operation phase.

Proposition 2 - Determination of consensus or divergence in the opinions of the large and medium sized contractor groups on the prioritization of strategies for improving client satisfaction

This proposition test was used to determine whether there is consensus or divergence in the opinions of the two groups / categories of contractors on the prioritization of the strategies for improving client satisfaction.

In particular, the ranking of strategy (a) - involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs – was examined to determine whether the majority of contractors recognize this as a strategy that could significantly help in meeting the needs of the client and improving client satisfaction levels in the South African building industry.

Spearman's rank correlation coefficient method was employed to test the correlation between each contractor category's ranking of the strategies for improving client satisfaction and the ranks calculated from the combined / pooled category's ratings.

A comparison of the prioritization of the medium and large sized contractor categories' views on the strategies for improving client satisfaction levels demonstrates significant correlation. This indicates consensus in the views of both categories of contractors on the ways in which client satisfaction may be improved. Thus regardless of the size of the contractor organization, it would appear that there is a convergence of opinions on the suggested strategies for improving client satisfaction levels. Again, this is a significant result for the industry that should interpret the strong correlation in the views of the two groups of contractors on strategies for improving client satisfaction as an accurate and true reflection of their views.

The results of the Spearman's rank correlation coefficient test indicate that there is consensus between medium sized contractors' prioritization of the strategies for improving client satisfaction and the prioritization of the same strategies by the

pooled category. A similar conclusion can be reached by comparing the large sized contractor category with the pooled category.

In conclusion, proposition 2 can be accepted on the basis that the result of the Spearman's rank correlation coefficient test points to significant correlation between the views of the medium and large sized contractor categories and those of the pooled category on the strategies for improving client satisfaction.

The results of the rank correlation test indicate that involving the contractor at the initial and critical stages of the project to obtain their input on how to meet clients' needs was rated as a significant strategy for improving client satisfaction by both groups of contractors, as well as the combined category. The medium sized group of contractors ranked this strategy higher than the large sized group of contractors. This could indicate that the smaller contractors place greater value on being included as part of the project team early in the construction procurement process. The larger contractors might view themselves as more self-sufficient and independent than the smaller contractors do, and therefore might not feel so strongly about inclusion early on in the construction procurement process. Notwithstanding this view, it would be beneficial, in this author's view, to include all contractors, large and small, in the early stages of construction projects in order to extract the benefit of their knowledge and expertise in constructability issues. Their input could be applied to enhance the quality of construction projects and therefore improve client satisfaction levels.

Summary

From the key research findings presented above it can be seen that the study's objectives i.e. to identify priority factors underlying client dissatisfaction from the contractors' viewpoint and to investigate ways of improving client satisfaction levels in the South African building industry, have been met.

The propositions that arose from the objectives of the study have all been tested and accepted based on correlation analysis tests.

6.3 RECOMMENDATIONS

The main idea behind this study was to canvass the views of contractors on the possible causes of client dissatisfaction in the South African building industry, and also to obtain their thoughts on possible ways of improving client satisfaction levels. The benefit of canvassing the views of contractors is that they are responsible for translating clients' visions into reality by constructing in accordance with designs and specifications, as documented by the professional team. Contractors have a unique perspective and therefore a very important contribution to make towards improving client satisfaction levels in the South African building industry.

The following recommendations can be made based on this study's findings and conclusions:

1. *Prioritisation of factors underlying client dissatisfaction from the contractors' viewpoint*

The significance given to identified underlying causes of client dissatisfaction by contractors should be taken on board by building and construction professionals when they execute construction projects. This could assist the professional team in giving certain aspects of the construction procurement process greater priority than others if required. Applying contractors' views on the prioritisation of factors underlying client dissatisfaction, on real construction projects, and integrating them with the views of the client, could facilitate the management of the construction projects to the benefit of the client and could improve client satisfaction levels.

2. *Prioritisation of suggested strategies for improving client satisfaction in the South African building industry from the contractors' perspective*

Both the medium and large sized group of contractors as well as the pooled category rated making use of a competent and reputable contractor as the most significant strategy for improving client satisfaction. The results of the correlation analysis indicate a strong convergence in the opinions of the two groups of contractors on strategies for improving client satisfaction levels in the South African building

industry. The strong consensus among contractors on the prioritisation of strategies for improving client satisfaction is significant and these strategies should be adopted by industry. The most significant strategies as ranked by the respondents in the study should be adopted and put into practice in the industry as soon as is practicable so that the benefits of these strategies on client satisfaction can be entrenched.

Involving contractors at the initial critical stages of the construction project procurement process could add value to the project since, in this author's view, the benefit of their input diminishes the further into the process one progresses. There is almost a point of diminishing returns, whereby the opportunity to incorporate the contractors input on matters such as buildability is lost if they are not involved at the crucial initial stages of the project. The contractors' contribution to the project would have the greatest impact on the outcome if it occurred early on in the process. A project's outcome is most greatly influenced at the upfront stage and this is where contractors should be encouraged to participate and contribute. Their input could be applied to enhance the quality of construction projects and therefore improve client satisfaction levels.

Once prioritized, the mechanism by which the factors underlying client dissatisfaction could be addressed during project execution is suggested as an area for further study. Also the way in which the suggested strategies for improving client satisfaction levels could be practically and effectively implemented on construction projects in the South African building industry is an area that requires further investigation.

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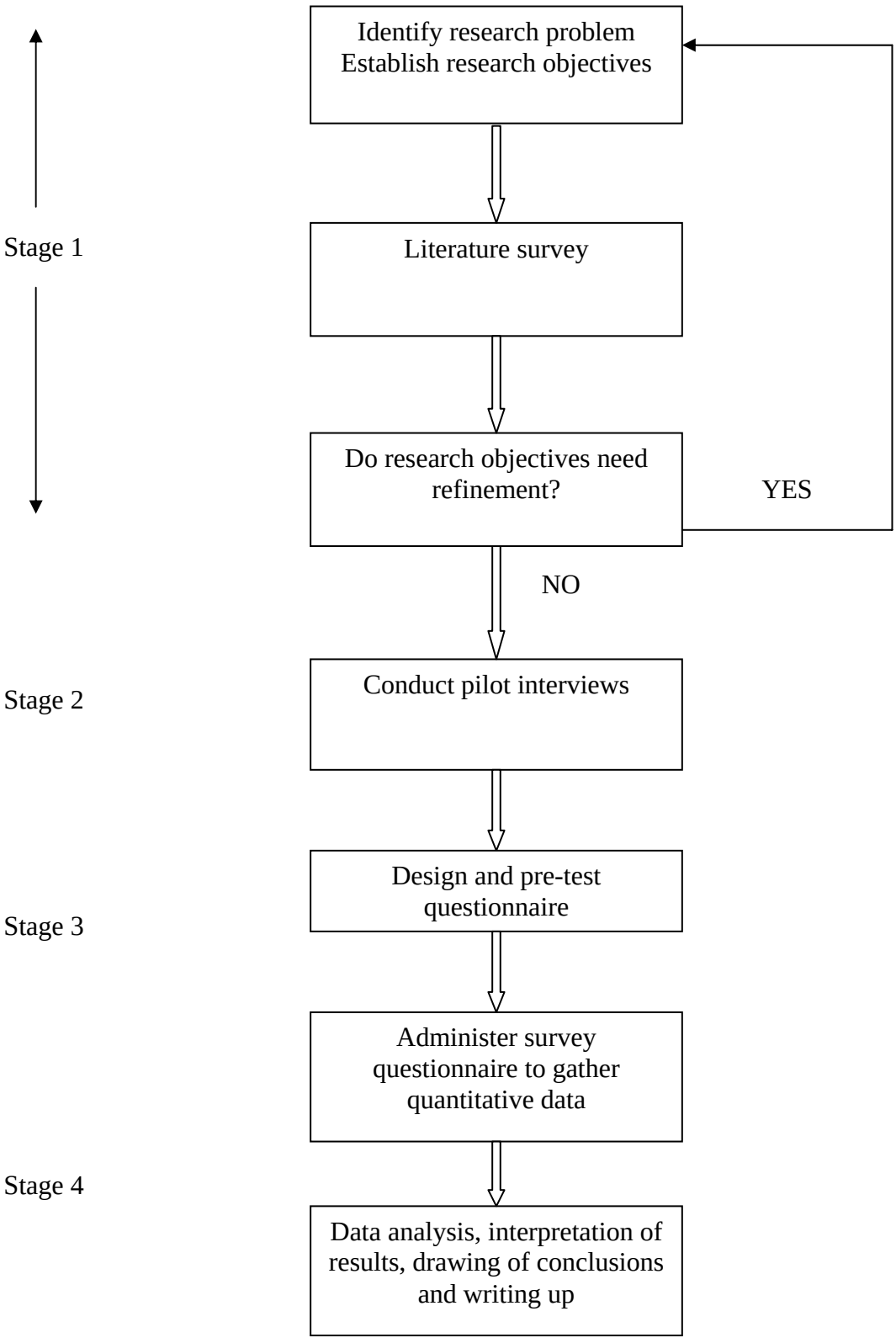
APPENDIX 1: RESEARCH STRATEGY



Flow chart illustrating process adopted in this study

APPENDIX 2

Faculty of Engineering and the Built Environment
University of the Witwatersrand
Private Bag 3, Wits 2050, South Africa
Fax: 011 303 2501 (Attention: David Hanson)
Cell: 0828526916

Mr. X
XYZ (Pty) Ltd
P.O. Box XX
Ferndale
2160
4/19/2007
Tel: 011 xxx xxxx
Fax: 011 xxx xxxx

Dear Mr. X,

RE: CAUSES OF CLIENT DISSATISFACTION AND WAYS OF IMPROVEMENT FROM THE CONTRACTORS' PERSPECTIVES

Current and future prospects in the building industry depend largely on the extent to which clients are satisfied with the outcome of the building procurement process. In the traditional procurement process contractors' input is usually sought only after the needs of the building owner have been assessed and designed for. As a result of this, the views of the contractors are not taken into account at the initial and critical stages of the building procurement process. This could be partly responsible for the reported prevalence of client dissatisfaction in the building industry world-wide.

Canvassing the views of contractors could identify the real causes of client dissatisfaction, and possible strategies for improvement. This is the premise underlying a masters research study entitled, "Causes of client dissatisfaction in the South African building industry and ways of improvement: the contractors' perspectives", at the School of Construction Economics and Management, Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg.

To realise the objectives of the study, the attached questionnaire has been carefully designed and pre-tested amongst a convenience sample of senior executives of building contracting companies, and will take approximately 15 to 20 minutes to complete.

We hereby kindly request your response to the survey. Not only would you be making an important and significant contribution to improving the quality and consistency of the work produced in the South African building industry by responding, but your response will also enhance the reliability of the findings of this research.

We undertake to provide you with an advance summary of the key findings of the study in return for your participation in the survey (see attached request form). Your anonymity will be strictly respected and your response will be used only as statistical data for the research.

Kindly return the completed questionnaire by fax to the number indicated as soon as possible to enable the researcher to meet the deadline for the completion of the study. Should you wish to receive a summary of the key research findings a request form for this purpose is attached. You may wish to complete and fax it back to us.

Thanking you in anticipation for your helpful response.

Yours sincerely,

David Hanson
(Researcher)

Dr. J.I. Mbachu
(Supervisor)

APPENDIX 3

RESEARCH SURVEY:

CAUSES OF CLIENT DISSATISFACTION IN THE SOUTH AFRICAN BUILDING INDUSTRY AND WAYS OF IMPROVEMENT: THE CONTRACTORS' PERSPECTIVES

BY
DAVID HANSON
SCHOOL OF CONSTRUCTION ECONOMICS AND MANAGEMENT
UNIVERSITY OF THE WITWATERSRAND

SECTION 1: DEMOGRAPHIC BACKGROUND

A *ORGANISATIONAL*

1 In what size category does your company belong?

☐ Large

☐ Medium

☐ Small

2 What is / are your company's area(s) of specialisation?

☐ Building construction ☐ Marine construction

☐ Civil construction ☐ Process plant construction

☐ Mining construction ☐ Other: _____

3 How long has your company been actively involved in the South African building industry?

☐ < 5 yrs ☐ 5 - 10 yrs ☐ > 10 yrs ☐ 11 - 15 yrs ☐ > 15 yrs

B *PERSONAL*

1 Kindly indicate how long you have been dealing with the South African building industry in a personal capacity:

☐ < 5 yrs ☐ 5 - 10 yrs ☐ > 10 yrs ☐ 11 - 15 yrs ☐ > 15 yrs

2 Please indicate your highest formal educational qualification (optional):

- ☐ High school certificate
- ☐ Diploma
- ☐ Higher National Diploma
- ☐ First degree
- ☐ Postgraduate diploma / certificate
- ☐ Postgraduate degree
- ☐ Other (please specify): _____

3 Kindly indicate your status in the organisation:

- ☐ MD
- ☐ Director / senior executive
- ☐ Manager
- ☐ Senior staff
- ☐ Supervisor
- ☐ Trainee / intern
- ☐ Other (please specify): _____

SECTION 2: CAUSES OF CLIENT DISSATISFACTION AND STRATEGIES FOR IMPROVING CLIENT SATISFACTION

Client satisfaction can be measured at the end of three distinct phases of the procurement process: At the end of the development (construction) process when the completed building is handed over to the client; at the early part of the operation phase when the completed building is expected to exhibit certain characteristics or features such as functional performance, market attractiveness, etc; and at the harvest part of the operation phase when the investor expects some economic / financial return on his investment or a realisation of the objectives for investment in the building.

1 Listed below are some possible underlying causes of client dissatisfaction at the end of the development (construction) phase. Kindly rate their relative significance with a check ✔ on the five-point scale provided. (Note: 'VS' = Very significant; 'S' = Significant; SS' = Somewhat significant; 'LS' = Of little significance; 'NS' = Not significant).

		Levels of significance					
		VS	S	SS	LS	NS	No idea
	Possible causes of client dissatisfaction at the end of the development (construction) phase	5	4	3	2	1	
a	Poor quality of workmanship						
b	Late completion						
c	Cost overruns						
d	"Lowest tender syndrome" (purely price driven selection of contractor sometimes leading to inferior quality end product)						
e	Unsatisfactory service delivery by the professionals						
f	Unrealistic construction programs imposed by clients						
g	Design flaws / defective design						
h	Inexperienced clients' inability to visualize what they are getting resulting in unfulfilled expectations						
i	Poor management and leadership by principal agents						
j	Personality clashes / conflict impacting on progress and quality						
k	Poor performance by contractor						
l	The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor						
m	Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors						
n	Contractors being claims orientated						
o	Breach of occupational health and safety regulations by contractor						
p	Contractor not complying with environmental management requirements						
q	Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress						

Any other suggestions:

1 _____

2 _____

2 Listed below are some possible underlying causes of client dissatisfaction at the early part of the operation phase.
Kindly rate their relative significance as before.

	Possible causes of client dissatisfaction at the early part of the operation phase	Levels of significance VS 5	S 4	SS 3	LS 2	NS 1	No idea
a	Manifestation of defects						
b	Design and specification deficiencies						
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly						
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)						
e	Slow reaction time on part of contractor to attend to defects						
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)						

Any other suggestions:

1 _____

2 _____

3 Listed below are some possible underlying causes of client dissatisfaction at the harvest part of the operation phase.
Kindly rate their relative significance as before.

	Possible causes of client dissatisfaction at the harvest part of the operation phase	Levels of significance VS 5	S 4	SS 3	LS 2	NS 1	No idea
a	Client not achieving desired outcome or projected returns on investment						
b	Property value depreciation and low occupancy levels due to poor site location						
c	High operating and maintenance costs due to poor design and material specification						
d	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements						
e	Lack of design flexibility or ease of adaptation to meet user requirements						

Any other suggestions:

1 _____

2 _____

4 The following strategies have been suggested for improving client satisfaction levels.
Kindly rate their relative significance as before.

	Strategies for improving client satisfaction levels	Levels of significance					
		VS	S	SS	LS	NS	No idea
		5	4	3	2	1	
a	Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs						
b	Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options						
c	Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning						
d	Make use of a competent professional team						
e	Make use of a competent and reputable contractor						
f	Avoid lowest tender syndrome; selection should be based on contractors ability to deliver						
g	Clients should set more realistic construction programs which could result in a better quality end product						
h	Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.						
í	Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service						
j	Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team						
k	Contractors should be more proactive in addressing problems on site						
l	Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management						
m	Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project						
n	Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor						

Any other suggestions:

1 _____

2 _____

APPRECIATION

Thank you for your time. **Kindly fax the filled questionnaire to 011-303-2501 (Attention: David Hanson)**.
If you have any comments, you may wish to contact the researcher using any of the following media:
Cell: 0828526916; Fax: 011-303-2501; E-mail: davidthesis@lycos.com. Else, please state your overall comments, if any, below:

_____

_____

_____

APPENDIX 4

ATTENTION: MR. DAVID HANSON

FAX: 011 303 2501

RESEARCH ON:

CAUSES OF CLIENT DISSATISFACTION IN THE SOUTH AFRICAN BUILDING INDUSTRY AND WAYS OF IMPROVEMENT: THE CONTRACTORS' PERSPECTIVES

I WISH TO RECEIVE A SUMMARY OF THE KEY FINDINGS OF THE RESEARCH THROUGH ANY OF MY CONTACT ADDRESSES GIVEN BELOW:

CONTACT DETAILS:

COMPANY (OPTIONAL): _____

_____

ATTENTION: _____

E-MAIL ADDRESS: _____

POSTAL ADDRESS: P.O. Box/Posbus: _____

City: _____

Postal code: _____

TELEPHONE: Office: _____

FAX: Office: _____

APPENDIX 5

Faculty of Engineering and the Built Environment
University of the Witwatersrand
Private Bag 3, Wits 2050, South Africa
Fax: 011 303 2501 (Attention: David Hanson)
Cell: 0828526916

Mr. X
XYZ (Pty) Ltd
P.O. Box xxx
Ferndale
2160
4/19/2007
Tel: 011 xxx xxxx
Fax: 011 xxx xxxx

Dear Mr. X,

RE: CAUSES OF CLIENT DISSATISFACTION AND WAYS OF IMPROVEMENT FROM THE CONTRACTORS' PERSPECTIVES

We wish to remind you about the questionnaire on the above subject that was faxed to you some days back.

Kindly fill in the questionnaire and fax it to the number provided in the questionnaire at your earliest convenience, by ..... if possible. This is to enable the researcher to meet the deadline for the completion of the study.

If you are receiving this notice for the first time, or if the original questionnaire faxed to you has been misplaced, please find attached another copy of the questionnaire.

Thank you for your anticipated participation in this survey!

Yours sincerely,

David Hanson (Researcher)

Dr. J.I. Mbachu (Supervisor)

APPENDIX 6

Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase - medium

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Poor quality of workmanship	14	54%	5	19%	5	19%	2	8%		0%	26	4.192	0.074	2
b	Late completion	14	54%	7	27%	3	12%	2	8%		0%	26	4.269	0.075	1
c	Cost overruns	11	42%	9	35%	4	15%	1	4%	1	4%	26	4.077	0.072	3
d	"Lowest tender syndrome" (purely price driven selection of contractor sometimes leading to inferior quality end product)	13	50%	6	23%	2	8%	5	19%		0%	26	4.038	0.071	4
e	Unsatisfactory service delivery by the professionals	3	12%	9	36%	7	28%	6	24%		0%	25	3.360	0.059	11
f	Unrealistic construction programs imposed by clients	10	40%	5	20%	5	20%	5	20%		0%	25	3.800	0.067	6
g	Design flaws / defective design	5	19%	7	27%	9	35%	3	12%	2	8%	26	3.385	0.059	9
h	Inexperienced clients' inability to visualize what they are getting resulting in unfulfilled expectations	6	23%	7	27%	10	38%	2	8%	1	4%	26	3.577	0.063	7
i	Poor management and leadership by principal agents	5	19%	6	23%	10	38%	4	15%	1	4%	26	3.385	0.059	10
j	Personality clashes / conflict impacting on progress and quality	1	4%	1	4%	13	50%	8	31%	3	12%	26	2.577	0.045	15
k	Poor performance by contractor	8	31%	10	38%	6	23%	1	4%	1	4%	26	3.885	0.068	5
l	The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor)	3	12%	5	19%	6	23%	9	35%	3	12%	26	2.846	0.050	14
m	Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors	5	20%	7	28%	6	24%	4	16%	3	12%	25	3.280	0.058	12
n	Contractors being claims orientated	3	12%	4	15%	10	38%	6	23%	3	12%	26	2.923	0.051	13
o	Breach of occupational health and safety regulations by contractor	1	4%		0%	5	19%	9	35%	11	42%	26	1.885	0.033	17
p	Contractor not complying with environmental management requirements	1	4%		0%	6	24%	7	28%	11	44%	25	1.920	0.034	16
q	Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress	5	19%	11	42%	3	12%	6	23%	1	4%	26	3.500	0.062	8
												Total	57	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 7

Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase - large

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Poor quality of workmanship	7	70%	1	10%		0%		0%	2	20%	10	4.100	0.071	2
b	Late completion	5	50%	1	10%	3	30%	1	10%		0%	10	4.000	0.070	4
c	Cost overruns	5	50%	1	10%	4	40%		0%		0%	10	4.100	0.071	2
d	"Lowest tender syndrome" (purely price driven selection of contractor sometimes leading to inferior quality end product)	4	40%	2	20%	2	20%	2	20%		0%	10	3.800	0.066	8
e	Unsatisfactory service delivery by the professionals	2	20%	6	60%	2	20%		0%		0%	10	4.000	0.070	4
f	Unrealistic construction programs imposed by clients	2	20%	8	80%		0%		0%		0%	10	4.200	0.073	1
g	Design flaws / defective design	2	20%	3	30%	3	30%	2	20%		0%	10	3.500	0.061	10
h	Inexperienced clients' inability to visualize what they are getting resulting in unfulfilled expectations	3	30%	2	20%	2	20%	2	20%	1	10%	10	3.400	0.059	11
i	Poor management and leadership by principal agents	3	30%	3	30%	4	40%		0%		0%	10	3.900	0.068	6
j	Personality clashes / conflict impacting on progress and quality	1	11%	1	11%	2	22%	4	44%	1	11%	9	2.667	0.046	14
k	Poor performance by contractor	4	40%	2	20%	3	30%	1	10%		0%	10	3.900	0.068	6
l	The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor)	1	10%	1	10%	4	40%	3	30%	1	10%	10	2.800	0.049	13
m	Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors	1	10%	1	10%	5	50%	2	20%	1	10%	10	2.900	0.050	12
n	Contractors being claims orientated		0%		0%	6	67%	2	22%	1	11%	9	2.556	0.044	15
o	Breach of occupational health and safety regulations by contractor		0%		0%	2	20%	5	50%	3	30%	10	1.900	0.033	17
p	Contractor not complying with environmental management requirements	1	11%		0%	1	11%	4	44%	3	33%	9	2.111	0.037	16
q	Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress	2	20%	5	50%	1	10%	2	20%		0%	10	3.700	0.064	9
												Total	58	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 8

Analysis of the levels of significance of the factors underlying client dissatisfaction at the end of the development (construction) phase - pooled

	Factors	MR Medium	MR Large	MR Pooled	RMR	Rank
a	Poor quality of workmanship	4.192	4.100	4.146	0.072	1
b	Late completion	4.269	4.000	4.135	0.072	2
c	Cost overruns	4.077	4.100	4.088	0.071	3
d	"Lowest tender syndrome" (purely price driven selection of contractor sometimes leading to inferior quality end product)	4.038	3.800	3.919	0.068	5
e	Unsatisfactory service delivery by the professionals	3.360	4.000	3.680	0.064	7
f	Unrealistic construction programs imposed by clients	3.800	4.200	4.000	0.070	4
g	Design flaws / defective design	3.385	3.500	3.442	0.060	11
h	Inexperienced clients' inability to visualize what they are getting resulting in unfulfilled expectations	3.577	3.400	3.488	0.061	10
i	Poor management and leadership by principal agents	3.385	3.900	3.642	0.064	8
j	Personality clashes / conflict impacting on progress and quality	2.577	2.667	2.622	0.046	15
k	Poor performance by contractor	3.885	3.900	3.892	0.068	6
l	The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor)	2.846	2.800	2.823	0.049	13
m	Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors	3.280	2.900	3.090	0.054	12
n	Contractors being claims orientated	2.923	2.556	2.739	0.048	14
o	Breach of occupational health and safety regulations by contractor	1.885	1.900	1.892	0.033	17
p	Contractor not complying with environmental management requirements	1.920	2.111	2.016	0.035	16
q	Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress	3.500	3.700	3.600	0.063	9
				57	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 9

Analysis of the levels of significance of the factors underlying client dissatisfaction at the early part of the operation phase - medium

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Manifestation of defects	2	8%	8	33%	10	42%	4	17%		0%	24	3.333	0.158	4
b	Design and specification deficiencies	7	28%	12	48%	5	20%	1	4%		0%	25	4.000	0.189	1
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly	3	12%	8	32%	10	40%	3	12%	1	4%	25	3.360	0.159	3
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)	5	21%	7	29%	4	17%	4	17%	4	17%	24	3.208	0.152	6
e	Slow reaction time on part of contractor to attend to defects	7	28%	11	44%	5	20%	2	8%		0%	25	3.920	0.186	2
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)	3	13%	6	25%	10	42%	5	21%		0%	24	3.292	0.156	5
												Total	21	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 10

Analysis of the levels of significance of the factors underlying client dissatisfaction at the early part of the operation phase - large

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Manifestation of defects	2	20%	3	30%	4	40%	1	10%		0%	10	3.600	0.165	3
b	Design and specification deficiencies	2	20%	3	30%	4	40%	1	10%		0%	10	3.600	0.165	3
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly	3	30%	6	60%		0%	1	10%		0%	10	4.100	0.188	2
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)	2	20%	3	30%	2	20%	2	20%	1	10%	10	3.300	0.151	5
e	Slow reaction time on part of contractor to attend to defects	4	44%	2	22%	3	33%		0%		0%	9	4.111	0.188	1
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)	1	13%	1	13%	4	50%	2	25%		0%	8	3.125	0.143	6
												Total	22	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 11

Analysis of the levels of significance of the factors underlying client dissatisfaction at the harvest part of the operation phase - medium

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Client not achieving desired outcome or projected returns on investment	7	32%	6	27%	6	27%	1	5%	2	9%	22	3.682	0.206	2
b	Property value depreciation and low occupancy levels due to poor site location	7	33%	6	29%	4	19%	2	10%	2	10%	21	3.667	0.205	3
c	High operating and maintenance costs due to poor design and material specification	9	39%	6	26%	4	17%	2	9%	2	9%	23	3.783	0.212	1
d	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements	3	14%	8	38%	4	19%	4	19%	2	10%	21	3.286	0.184	5
e	Lack of design flexibility or ease of adaptation to meet user requirements	3	14%	11	50%	3	14%	3	14%	2	9%	22	3.455	0.193	4
												Total	18	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 12

Analysis of the levels of significance of the factors underlying client dissatisfaction at the harvest part of the operation phase - large

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Client not achieving desired outcome or projected returns on investment	2	22%	3	33%	3	33%	1	11%		0%	9	3.667	0.212	3
b	Property value depreciation and low occupancy levels due to poor site location	2	22%	5	56%		0%	2	22%		0%	9	3.778	0.218	2
c	High operating and maintenance costs due to poor design and material specification	1	11%	6	67%	1	11%	1	11%		0%	9	3.778	0.218	1
d	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements		0%	3	33%	3	33%	3	33%		0%	9	3.000	0.173	5
e	Lack of design flexibility or ease of adaptation to meet user requirements		0%	2	22%	6	67%	1	11%		0%	9	3.111	0.179	4
												Total	17	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 13

Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - medium

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Manifestation of defects	2	8%	8	33%	10	42%	4	17%		0%	24	3.333	0.106	6
b	Design and specification deficiencies	8	32%	9	36%	4.5	18%	1.5	6%	2	8%	25	3.780	0.120	2
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly	3	12%	8	32%	10	40%	3	12%	1	4%	25	3.360	0.107	5
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)	5	21%	7	29%	4	17%	4	17%	4	17%	24	3.208	0.102	9
e	Slow reaction time on part of contractor to attend to defects	7	28%	11	44%	5	20%	2	8%		0%	25	3.920	0.124	1
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)	3	13%	8.5	35%	6.5	27%	4	17%	2	8%	24	3.271	0.104	8
g	Client not achieving desired outcome or projected returns on investment	7	32%	6	27%	6	27%	1	5%	2	9%	22	3.682	0.117	3
h	Property value depreciation and low occupancy levels due to poor site location	7	33%	6	29%	4	19%	2	10%	2	10%	21	3.667	0.116	4
i	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements	3	14%	8	38%	4	19%	4	19%	2	10%	21	3.286	0.104	7
												Total	32	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 14

Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - large

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Manifestation of defects	2	20%	3	30%	4	40%	1	10%		0%	10	3.600	0.111	6
b	Design and specification deficiencies	1.5	16%	4.5	47%	2.5	26%	1	11%	0	0%	9.5	3.684	0.113	4
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly	3	30%	6	60%		0%	1	10%		0%	10	4.100	0.126	2
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)	2	20%	3	30%	2	20%	2	20%	1	10%	10	3.300	0.102	7
e	Slow reaction time on part of contractor to attend to defects	4	44%	2	22%	3	33%		0%		0%	9	4.111	0.127	1
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)	1	11%	1.5	17%	5	56%	1.5	17%	0	0%	9	3.222	0.099	8
g	Client not achieving desired outcome or projected returns on investment	2	22%	3	33%	3	33%	1	11%		0%	9	3.667	0.113	5
h	Property value depreciation and low occupancy levels due to poor site location	2	22%	5	56%		0%	2	22%		0%	9	3.778	0.116	3
i	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements		0%	3	33%	3	33%	3	33%		0%	9	3.000	0.092	9
												Total	32	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 15

Analysis of the levels of significance of the factors underlying client dissatisfaction at the operation phase - pooled

	Factors	MR Medium	MR Large	MR Pooled	RMR	Rank
a	Manifestation of defects	3.333333333	3.600	3.467	0.108	6
b	Design and specification deficiencies	3.78	3.684	3.732	0.117	2
c	Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly	3.36	4.100	3.730	0.117	3
d	Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.)	3.208333333	3.300	3.254	0.102	7
e	Slow reaction time on part of contractor to attend to defects	3.92	4.111	4.016	0.126	1
f	Lack of design flexibility (inability to adapt the building to clients' changing requirements)	3.270833333	3.222	3.247	0.102	8
g	Client not achieving desired outcome or projected returns on investment	3.681818182	3.667	3.674	0.115	5
h	Property value depreciation and low occupancy levels due to poor site location	3.666666667	3.778	3.722	0.116	4
i	Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements	3.285714286	3.000	3.143	0.098	9
				32	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 16

Analysis of the levels of significance of suggested strategies for improving client satisfaction - medium

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs	17	68%	5	20%	1	4%	2	8%		0%	25	4.480	0.076	5
b	Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options	4	17%	6	26%	11	48%	1	4%	1	4%	23	3.478	0.059	13
c	Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning	9	38%	12	50%	2	8%		0%	1	4%	24	4.167	0.071	8
d	Make use of a competent professional team	21	84%	2	8%	2	8%		0%		0%	25	4.760	0.081	2
e	Make use of a competent and reputable contractor	22	88%	3	12%		0%		0%		0%	25	4.880	0.083	1
f	Avoid lowest tender syndrome; selection should be based on contractors ability to deliver	19	76%	6	24%		0%		0%		0%	25	4.760	0.081	3
g	Clients should set more realistic construction programs which could result in a better quality end product	15	60%	7	28%	3	12%		0%		0%	25	4.480	0.076	5
h	Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.	2	8%	7	28%	11	44%	5	20%		0%	25	3.240	0.055	14
i	Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service	7	28%	13	52%	3	12%	1	4%	1	4%	25	3.960	0.067	11
j	Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team	9	36%	14	56%	2	8%		0%		0%	25	4.280	0.072	7
k	Contractors should be more proactive in addressing problems on site	8	32%	12	48%	5	20%		0%		0%	25	4.120	0.070	10
l	Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management	5	20%	6	24%	12	48%	2	8%		0%	25	3.560	0.060	12
m	Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project	10	40%	10	40%	4	16%	1	4%		0%	25	4.160	0.070	9
n	Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor	20	80%	4	16%	1	4%		0%		0%	25	4.760	0.081	3
												Total	59	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 17

Analysis of the levels of significance of suggested strategies for improving client satisfaction - large

	Factors	Levels of significance										TR	MR	RMR	Rank
		Very significant		Significant		Somewhat significant		Of little significance		Not significant					
		5		4		3		2		1					
		No	%	No	%	No	%	No	%	No	%				
a	Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs	3	30%	4	40%	2	20%	1	10%		0%	10	3.900	0.069	9
b	Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options	1	10%	4	40%	4	40%	1	10%		0%	10	3.500	0.062	12
c	Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning	2	22%	4	44%	3	33%		0%		0%	9	3.889	0.068	10
d	Make use of a competent professional team	7	70%	2	20%	1	10%		0%		0%	10	4.600	0.081	3
e	Make use of a competent and reputable contractor	9	90%	1	10%		0%		0%		0%	10	4.900	0.086	1
f	Avoid lowest tender syndrome; selection should be based on contractors ability to deliver	4	40%	6	60%		0%		0%		0%	10	4.400	0.077	5
g	Clients should set more realistic construction programs which could result in a better quality end product	6	60%	4	40%		0%		0%		0%	10	4.600	0.081	3
h	Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.		0%	3	30%	4	40%	3	30%		0%	10	3.000	0.053	14
i	Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service	4	40%	3	30%	3	30%		0%		0%	10	4.100	0.072	7
j	Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team	3	30%	5	50%	2	20%		0%		0%	10	4.100	0.072	7
k	Contractors should be more proactive in addressing problems on site	1	11%	6	67%	2	22%		0%		0%	9	3.889	0.068	10
l	Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management	1	10%	3	30%	3	30%	3	30%		0%	10	3.200	0.056	13
m	Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project	3	33%	4	44%	2	22%		0%		0%	9	4.111	0.072	6
n	Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor	7	70%	3	30%		0%		0%		0%	10	4.700	0.083	2
												Total	57	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 18

Analysis of the levels of significance of suggested strategies for improving client satisfaction - pooled

	Factors	MR Medium	MR Large	MR Pooled	RMR	Rank
a	Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs	4.480	3.900	4.190	0.072	6.000
b	Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options	3.478	3.500	3.489	0.060	12.000
c	Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning	4.167	3.889	4.028	0.069	10.000
d	Make use of a competent professional team	4.760	4.600	4.680	0.081	3.000
e	Make use of a competent and reputable contractor	4.880	4.900	4.890	0.084	1.000
f	Avoid lowest tender syndrome; selection should be based on contractors ability to deliver	4.760	4.400	4.580	0.079	4.000
g	Clients should set more realistic construction programs which could result in a better quality end product	4.480	4.600	4.540	0.078	5.000
h	Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.	3.240	3.000	3.120	0.054	14.000
i	Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service	3.960	4.100	4.030	0.069	9.000
j	Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team	4.280	4.100	4.190	0.072	7.000
k	Contractors should be more proactive in addressing problems on site	4.120	3.889	4.004	0.069	11.000
l	Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management	3.560	3.200	3.380	0.058	13.000
m	Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project	4.160	4.111	4.136	0.071	8.000
n	Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor	4.760	4.700	4.730	0.082	2.000
				58	1.000	

TR = Total number of respondents rating a particular variable; MR = Mean rating; RMR = Relative mean rating.

APPENDIX 19

Spearman's Rank Correlation Coefficient Calculation: Causes of client dissatisfaction at the end of development (construction) phase

*Ranks: 1 = Cause perceived to be most significant by a group; All = All respondents: medium and large contractors; CCDD = Causes of client dissatisfaction at end of development phase (see details below); MR = Mean rating analysed from group's responses: 5 = Very significant; 4 = Significant; 3 = Somewhat significant; 2 = Of little significance; 1 = Not significant

	*Ranks computed from groups' responses								
	All contractors			Medium contractors			Large contractors		
	CCDD	MR	Rank	CCDD	MR	Rank	CCDD	MR	Rank
Significant factors: MR > 3.5	a	4.146	1	a	4.192	2	a	4.100	2
	b	4.135	2	b	4.269	1	b	4.000	4
	c	4.088	3	c	4.077	3	c	4.100	2
	d	3.919	5	d	4.038	4	d	3.800	8
	e	3.680	7	e	3.360	11	e	4.000	4
	f	4.000	4	f	3.800	6	f	4.200	1
	g	3.442	11	g	3.385	9	g	3.500	10
	h	3.488	10	h	3.577	7	h	3.400	11
	i	3.642	8	i	3.385	9	i	3.900	6
Not-so-significant factors: MR < 3.5	j	2.622	15	j	2.577	15	j	2.667	14
	k	3.892	6	k	3.885	5	k	3.900	6
	l	2.823	13	l	2.846	14	l	2.800	13
	m	3.090	12	m	3.280	12	m	2.900	12
	n	2.739	14	n	2.923	13	n	2.556	15
	o	1.892	17	o	1.885	17	o	1.900	17
	p	2.016	16	p	1.920	16	p	2.111	16
	q	3.600	9	q	3.500	8	q	3.700	9
Spearman rank correlation coefficient, R: Medium								0.84	
Spearman rank correlation coefficient, R: Medium									0.95
Spearman rank correlation coefficient, R: Large									0.95
R critical ($R_{.05}$) (n = 17) (one-tailed test):								0.49	0.49	0.49
*Results:								SC	SC	SC

**Results: SC = Significantly correlated at 5% alpha if $R \geq R_{.05}$; otherwise not significantly correlated (NSC)*

Possible causes of client dissatisfaction at the end of development phase (CCDD):

a) Poor quality of workmanship; b) Late completion; c) Cost overruns; d) "Lowest tender syndrome" (price driven selection of contractor); e) Unsatisfactory service delivery by professionals; f) Unrealistic construction programs imposed by clients; g) Design flaws / defective design; h) Clients' inability to visualize end product resulting in unfulfilled expectations; i) Poor management and leadership by principal agents; j) Personality clashes / conflict impacting on progress and quality; k) Poor performance by contractor; l) The issue of buildability / constructability (design not compatible with building / construction methodologies used by selected contractor); m) Incomplete / inadequate base information used at tender stage leading to inaccurate / incomplete bid submissions by contractors; n) Contractors being claims orientated; o) Breach of occupational health and safety regulations by contractor; p) Contractor not complying with environmental management requirements; q) Contractors' failure to provide sufficient resources on site to undertake supervision and ensure work progress

APPENDIX 20

Spearman's Rank Correlation Coefficient Calculation: Causes of client dissatisfaction at the operation phase

*Ranks: 1 = Cause perceived to be most significant by a group; All = All respondents: medium and large contractors; CCDO = Causes of client dissatisfaction at operation phase (see details below); MR = Mean rating analysed from group's responses: 5 = Very significant; 4 = Significant; 3 = Somewhat significant; 2 = Of little significance; 1 = Not significant

	*Ranks computed from groups' responses								
	All contractors			Medium contractor			Large contractor		
	CCDO	MR	Rank	CCDO	MR	Rank	CCDO	MR	Rank
Significant factors: MR ≥ 3.5	a	3.467	6	a	3.333	6	a	3.600	6
	b	3.732	2	b	3.780	2	b	3.684	4
	c	3.730	3	c	3.360	5	c	4.100	2
	d	3.254	7	d	3.208	9	d	3.300	7
	e	4.016	1	e	3.920	1	e	4.111	1
Not-so-significant factors: MR < 3.5	f	3.247	8	f	3.271	8	f	3.222	8
	g	3.674	5	g	3.682	3	g	3.667	5
	h	3.722	4	h	3.667	4	h	3.778	3
	i	3.143	9	i	3.286	7	i	3.000	9
Spearman rank correlation coefficient, R: Medium								0.78	
Spearman rank correlation coefficient, R: Medium									0.87
Spearman rank correlation coefficient, R: Large									0.95
R critical ($R_{.05}$) (n = 9) (one-tailed test):								0.68	0.68	0.68
*Results:								SC	SC	SC

**Results: SC = Significantly correlated at 5% alpha if $R \geq R_{.05}$; otherwise not significantly correlated (NSC)*

Possible causes of client dissatisfaction at the operation phase (CCDO):

a) Manifestation of defects; b) Design and specification deficiencies; c) Building services (e.g. HVAC, lighting, plumbing, etc.) not functioning properly; d) Functional inadequacies (e.g. structural stability problems, waterproofing failures, spatial inadequacies, etc.); e) Slow reaction time on part of contractor to attend to defects; f) Lack of design flexibility (inability to adapt the building to clients' changing requirements); g) Client not achieving desired outcome or projected returns on investment; h) Property value depreciation and low occupancy levels due to poor site location; i) Building not being attractive to prospective new tenants due to technological obsolescence / inability to adapt to future requirements;

APPENDIX 21

Spearman's Rank Correlation Coefficient Calculation: Strategies for improving client satisfaction levels

*Ranks: 1 = Strategy perceived to be most effective by a group; All = All respondents: medium and large contractors; SICS = Strategies for improving client satisfaction levels (see details below); MR = Mean rating analysed from group's responses: 5 = Very effective; 4 = Effective; 3 = Somewhat effective; 2 = Of little effect; 1 = Not effective

	*Ranks computed from groups' responses								
	All contractors			Medium contractor			Large contractor		
	SICS	MR	Rank	SICS	MR	Rank	SICS	MR	Rank
Effective strategies: MR ≥ 3.5	a	4.19	6	a	4.480	5	a	3.900	9
	b	3.489	12	b	3.478	13	b	3.500	12
	c	4.028	10	c	4.167	8	c	3.889	10
	d	4.68	3	d	4.760	2	d	4.600	3
	e	4.89	1	e	4.880	1	e	4.900	1
	f	4.58	4	f	4.760	2	f	4.400	5
	g	4.54	5	g	4.480	5	g	4.600	3
	h	3.12	14	h	3.240	14	h	3.000	14
	i	4.03	9	i	3.960	11	i	4.100	7
	j	4.19	6	j	4.280	7	j	4.100	7
	k	4.004	11	k	4.120	10	k	3.889	10
Not-so-effective strategies: MR < 3.5	l	3.38	13	l	3.560	12	l	3.200	13
	m	4.136	8	m	4.160	9	m	4.111	6
	n	4.73	2	n	4.760	2	n	4.700	2
Spearman rank correlation coefficient, R: Medium								0.88	
Spearman rank correlation coefficient, R: Medium									0.96
Spearman rank correlation coefficient, R: Large									0.95
R critical ($R_{.05}$) (n = 14) (one-tailed test):								0.54	0.54	0.54
*Results:								SC	SC	SC

**Results: SC = Significantly correlated at 5% alpha if $R \geq R_{.05}$; otherwise not significantly correlated (NSC)*

Strategies for improving client satisfaction (SICS):

a) Involve contractor at initial and critical stages of project so as to obtain his / her input on how to meet clients' needs; b) Eliminate fragmentation of services inherent in the traditional approach by adopting more appropriate procurement arrangement options; c) Allow adequate time during pre-construction phase for articulation of clients' requirements, feasibility studies, design, and planning; d) Make use of a competent professional team; e) Make use of a competent and reputable contractor; f) Avoid lowest tender syndrome; selection should be based on contractors ability to deliver; g) Clients should set more realistic construction programs which could result in a better quality end product; h) Contractors should undergo periodic skills development and training in vital areas such as occupational health and safety, value management, delivery, etc.; i) Avoid excessive cutting of professionals' fees that results in the provision of unsatisfactory service; j) Client and his agents should articulate needs and requirements properly and communicate these effectively to the project team;

k) Contractors should be more proactive in addressing problems on site; l) Contractors should put systems in place to ensure consistency and continuous improvement in quality (e.g. ISO systems), occupational health and safety, and environmental management; m) Contractors should make sure that there is pro-active and visible participation by its senior management / executives in the project; n) Professionals should make sure that construction progress is not delayed by the late supply of information to the contractor