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The effectiveness of construction project briefing as an interpersonal communication process

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Abstract

The main purpose of construction project briefing is to effectively transform the needs of the client from an abstract form into a concrete form. Research indicates a clear link between effective briefing and client satisfaction with their resultant buildings. This article documents the findings of a study concerning the effectiveness of construction project briefing as an interpersonal communication process. A case study approach was adopted. The sample included clients, building users, architects, quantity surveyors and project managers. The main finding was that there are no methodical procedures in place in the early stages of briefing. Conceptually, the various project participants were found to have a generic understanding of what ought to be included or excluded from briefing and debriefing, but there appears to be significant gaps between theory and practice.

Keywords: briefing, interpersonal communication, client, design, construction project

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Abstrak

Die hoofdoel van konstruksieprojek-voorligting is om die kliënt se behoeftes vanuit abstraktheid tot in 'n werklike struktuur doeltreffend te omskep. Dat kliënte as gevolg van behoorlike meedeling van projekopdragte wel met hul voltooide geboue tevrede gestel word, is deur navorsing bewys. Hierdie artikel bied die bevindinge voortvloeiend uit 'n gevallestudie oor die doeltreffendheid van konstruksieprojek-voorligting as interpersoonlike kommunikasieproses, aan. Die steekproef het kliënte, verbruikers van geboue, argitekte, bouekenaars en projekbestuurders ingesluit. Die hoofbevinding is dat tydens vroeë voorligtingstadia, word geen stelselmatige prosedures toegepas nie. Begripsegewys, dra die verskeie deelnemers algemene kennis van faktore wat tydens projekvoorligting en -evaluering in- of uitgesluit behoort te word, maar blykbaar bestaan daar aansienlike leemtes tussen teorie en die praktiese toepassing daarvan.

Sleutelwoorde: voorligting, interpersoonlike kommunikasie, kliënt, ontwerp, projek

1. Introduction

The history of briefing in the construction industry can be traced back to the 1950s when architects, influenced by sociological thinking, began to devise a method in design and a motive for brief-making. Some of the architects and planners who played major roles in the evolution of briefing practice include Louis Kahn, Horst Rittel, Christopher Alexander and Frank Duffy (Blyth & Worthington, 2001). The period from the 1970s through to the 1990s saw the practice moving from perceiving briefing and design as rigid interfaces to viewing briefing as an integral component of design. To this end, communication has become the core component of the briefing process in order to co-ordinate the various entities of the brief. Research indicates a clear link between effective briefing and client satisfaction with completed projects (Bowen, 1999; Barrett & Stanley, 1999; O'Reilly, 1973).

This article documents the findings of a study concerning the effectiveness of construction project briefing as an interpersonal communication process. A case study approach was adopted, with semi-structured interviews being used to elicit participants' views of the case studies under investigation. The sample included clients, building users, architects, quantity surveyors and project managers.

2. Theoretical framework

2.1 The concept of briefing

The Construction Industry Board (1997) defines briefing as an informative process by which the needs and desires of the client are communicated to others either officially or unofficially. Similarly, Taylor *et al.* (1980) define briefing as a process of interactions between entities that result in the production of something uniquely different from the original entity. The end product of this endeavour is the 'brief', the outcome of information gathered from studies, surveys, discussions and a number of judgments (Hymas, 2001). It is a formal, official, and functional document stipulating the client's requirements, prepared well before design commences and is endorsed by both the client and design team (Construction Industry Board, 1997; Gray *et al.*, 1994, Kelly *et al.*, 1992). The client's main objective will be the erection of a fully useful structure that justifies the need for which it is built (Chartered Institute of Building, 2003).

Communication may be thought of as a transaction between sender and receiver (Fischer, 1978). Within the context of the briefing process, the roles of sender and receiver are played consecutively by both parties i.e., client and design team. Viewing communication as an interpersonal transaction implies a form of conveyance or transportation across space. The components of this perspective consist of the 'message' (travelling across space from one point to another), the 'channel' (the mode of conveyance of the message), the 'source' and 'receiver', 'encoding' and 'decoding' (the process of transforming a message from one form to another at the point of transmission and destination), 'noise' (the extent to which the fidelity of the message is reduced), and 'feedback' (a message that is a response to another message). The transactional view of interpersonal communication is depicted in Figure 1.

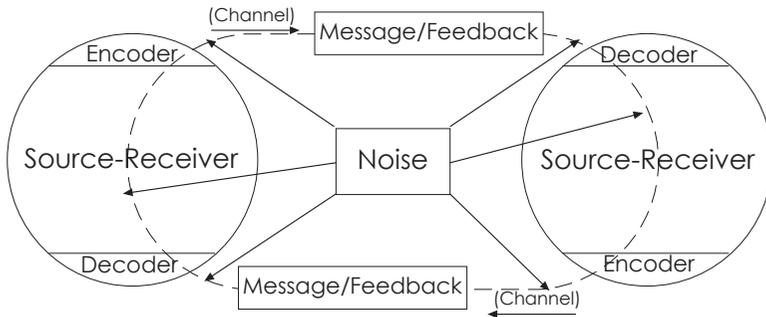


Figure 1: A transactional view of interpersonal communication
Source: Fisher, 1978

In terms of communication theory (see, for example, Feldberg, 1975), the process of structuring the client's brief may be thought of as an 'encoding' process. It entails the client presenting a 'mind model' to the design team, who in turn improves and develops it (Bowen, 1995). One of the outcomes of this process is the outline brief, which contains an adequate documentation of the client's perception of his or her needs. The brief should be able to communicate the client's needs to other professionals, including those who did not participate in the briefing process per se (Emmitt & Gorse, 2003; Gray *et al.*, 1994). The client's brief should also stipulate the possible limiting factors that require practical alternatives to be formulated. The process of brief construction is depicted in Figure 2 below.

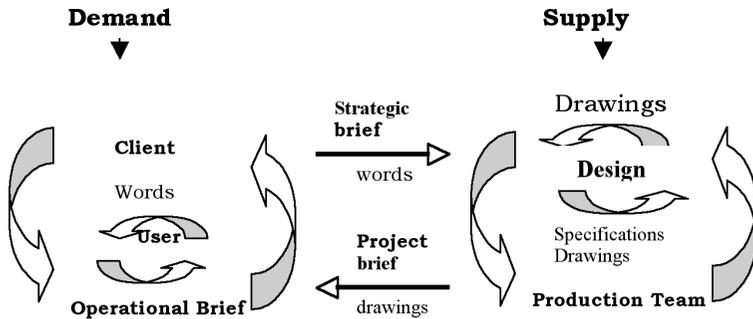


Figure 2: The briefing process
 Source: Blyth & Worthington, 2001: 54

Blyth & Worthington (2001) argue that the briefing process should allow for the flow of information from the strategic brief to a well defined client need with feedback loops to allow for reviewing and alterations. On the supply side, communication is between the design and production teams. Effective communication is imperative to ensure compatibility between design groups. Bridging the demand and supply sides implies obtaining information from both sides making decisions and sharing a common understanding. Essentially it is a process of exchanging briefs from either end. Clients initiate the briefing process by communicating their needs. The designer then gives meaning to the client's need in the context of plans, drawings, sketches and models and communicates the information to the client.

2.2 What are the responsibilities of the sender and receiver that can add to the successful communication of the client's brief

In construction projects, information exchange occurs between the client and the design team, between individual design team members, as well as among members of the client team. The sender, whether client or design team member, has the responsibility of structuring information in a way that is detailed, clear and unambiguous. Hence, the obligation of attaining shared meaning is placed on the sender (Emmitt & Gorse, 2003; Bowen, 1993; Feldberg, 1975). In an attempt to attain shared understanding, clients normally hold frequent face-to-face meetings with design teams. The design team's

level of brief understanding is determined by the fit between re-interpretation of needs and the original ones as reflected in the design product. Bowen (1993: 17) asserts that "feedback is the main mechanism for evaluating the effectiveness of the communication process." Client feedback is necessary for objective balancing (Wallace, 1987).

Barriers to effective communication may rise if the person within the client organisation fulfilling the role as the communication sender is inexperienced. It must be remembered that the design team is performing a service for the client's satisfaction. What this implies is that the design team also has a duty to actively seek clarification from the client. Thus, according to Bowen (1993), the design team needs to understand the political climate prevailing in the client's organisation and also to take cognisance of the client's level of sophistication. In practical terms, the very nature of the communication process necessitates that all participants adopt sender and receiver roles, meaning that the onus for the attainment of shared meaning is joint and several.

2.3 Problems associated with the briefing process

There is potential for misunderstandings and communication breakdowns in any human communication interaction (Rougvie, 1991). It is necessary to recognise and acknowledge the existence of the hurdles which cause barriers to effective communication if the efficiency of the briefing process is to be improved (Brown, 2001). The following are identified in the literature as some of the barriers to successful briefing:

- **Agendas:** The client organisation is usually composed of individuals who might be sharing work on different projects and who have different goals and objectives (Bowen, 1993; Rougvie, 1991; Coles, 1990). Many of their interests are poorly articulated, making it difficult to translate them into the language of building (Emmitt & Gorse, 2003; Brown, 2001). Even within the design team, members might hold conflicting priorities and aspirations, and may not have aligned themselves with the objectives of the client (Bowen *et al.*, 1999). For example, the client may desire the maximisation of revenue generation, the architect might be primarily interested in aesthetic optimisation (at the expense of time and cost), while the quantity surveyor is likely to be concerned with

minimising the capital cost (at the expense of architectural 'magnificence' (Brown, 2001; Higgin & Jessop, 1965). Failures to reconcile such individual frames of reference often result in different factual interpretations of the brief (Blyth & Worthington, 2001).

- Language and perception: The most common influences on perception, namely assumptions, cultural expectations, motivation and attitude, amongst others are all relevant factors in the briefing process, as is language with its many complicating factors, like abstraction, complexity, etc. A distinction needs to be made between the factors influencing perception and those of language. The potential for misunderstandings is high when professionals with composite traditional and educational backgrounds meet, since language, culture and traditions all influence perceptions (Brown, 2001). There is a particularly high likelihood that this will be a problem in the South African environment (Bowen, 1995). Further, the high level of abstraction and technical language, such as is used in the price messages sent to architects and clients by the quantity surveyor render the attainment of shared meaning difficult (Bowen, 1993). On this issue, Gray & Hughes (2001) note that the use of jargon is only valuable to those who share it to quickly express complex issues. Where it is used between groups of differing backgrounds, it is likely to result in ineffective communication (Bowen, 1993).
- Translation: The translation of the client's brief can be problematic during development of the design. Extracting meaning can be highly subjective, and hence conflictual. Attempts on the part of the receiving party (consecutively both client and design team members are receiving parties) to seek clarification might be misconstrued as fault-finding rather than the need to understand, sometimes leading to conflict (Verma, 1996).
- Specialisation: With increased specialisation in the design process it becomes difficult for design team members to easily reach a common understanding regarding the 'best' solution to the client's need. Unless the receiving party has some 'specialised' knowledge on the subject, they have to rely on 'trust' that the level of expertise applied is appropriate. Gray & Hughes (2001) claim that the traditional role

of the architect or engineer has been fragmented into numerous areas of specialty. They attribute this to the increased diversity of client need, technological advancement, and institutional defensiveness. Bowen (1995) considered that such fragmentation of design results in a lack of mutual appreciation of specialised knowledge areas.

- Lack of formality at inception: A study by Bowen *et al.* (1999) found that there is a tendency for communication at the inception stage to be informal, based on the finding that the majority of the architects surveyed operated without any established brief-eliciting procedures. Another example of informality, from an earlier survey (Bowen, 1993), revealed that the majority of quantity surveyors did not make use of engagement letters in communicating price-related information to clients and architects. This study also established that quantity surveyors and architects invariably did not receive written copies of the client's brief. This is obviously problematic as failure to properly document and agree upon the client's brief will result in the absence of a frame of reference against which to evaluate the actions of members of the design team and the resultant building.
- Role ambiguity and participation: Inexperienced clients and sometimes even design team members are unsure about what their individual roles should be as these are not clearly defined at the outset of the project, resulting in confusion, 'ambiguity and unfulfilled expectations' (Blyth & Worthington, 2001: 86; Tunstall, 2000). Duplication or omissions of tasks are normally the result of unclear responsibilities, which can culminate in delays and confusion. Brown (2001) and Gray *et al.* (1994) point to a 'wheel of dominance' whereby different groups predominate at different times of the project life cycle. The interpersonal communication process can therefore be influenced and complicated by various factors (like dynamics within various teams) at different stages of the project, which will reflect in its effectiveness. Disagreements also exist regarding what constitutes a comprehensive brief, with a distinct perceptual gap between the client's and the architect's definitions thereof (Bowen *et al.*, 1999). Brown (2001) refers in this regard to the 'stranded user', who is effectively excluded from the briefing process and is subsequently a victim of perceptual gaps between the designer and the user, and, between the client and the user.

- Brief modifications: Frequent changes to the design brief present the potential for misunderstandings in communication between participants. These, coupled with changes after the completion of the detailed design, often impact negatively on the project (Rougvie, 1991). Higgin & Jessop (1965) attribute the issue of late changes to inadequate examination of the client's needs and the possible constraints to the realisation of those desires. This culminates in the development of an inadequate brief that is unlikely to be completely comprehended by all stakeholders.
- Medium of brief transmission: The form in which the brief is communicated to, and within, the design team is important. The brief can be presented in written form, written combined with oral or oral form alone. Problems can result when only oral presentation is used since the receiving audience might forget some details or fail to properly comprehend the brief. In the studies of Bowen (1995) and Bowen *et al.* (1999) it emerged that architects were invariably provided with the brief in an oral format. Drawings and written documents, if they are not properly conceived, will give rise to delays in the project, additional expense to the client, and the potential for disputes and claims (Emmitt & Yeomans, 2001).

2.4 Research questions

It is against this background that the following research questions were formulated, the objective being that, collectively, they would (i) assist in developing an understanding of the problems associated with construction project briefing as an interpersonal communication process and (ii) provide direction in the solution of these problems.

- Question 1: What are the barriers to effective briefing?
- Question 2: How can the communication of the client's brief be improved?
- Question 3: What are the responsibilities of the sender and receiver that can enhance communication of the client's brief?
- Question 4: What steps can be taken to develop a shared language between the client and the design team?

As a result the hypotheses under investigation are non-directional since the study seeks to expose communication issues that affect the briefing process rather than proving or disproving their existence. The propositions to be examined are as follows:

- The effectiveness of the briefing process as a communication tool is dependent upon the medium of communication, inclusion of the design team in the initial presentation, and the client and designer's experience; and
- Briefing is a process and not an event.

3. Research method

The scientific method was not adopted for this research project. Rather, triangulation was utilised within a case study context. The study described in this paper attempted to explain the possible causes of poor understanding of the client's brief based on the opinions of clients, designers, quantity surveyors and project managers. Previous studies, for example Bowen (1999), used national questionnaire surveys of these professionals, but a limitation of this approach is that it is incapable of examining context-specific issues (Yin, 1994). The case study approach allows a phenomenon to be studied within its natural context, which makes it particularly appropriate in the exploration of social events, because they are usually intertwined with the environment (Miles & Huberman, 1994; Yin, 1994).

The case study approach requires the selection of more than one case (Yin, 1994). Two cases were selected for analysis, the basis of selection being that they should be current or very recent projects in order to ensure the freshness of participants' memories. Semi-structured interviews have the potential to produce rich data and are therefore particularly appropriate in the analysis of cases (Gillam, 2000). Therefore, semi-structured interviews were used as the main method of gathering empirical information, but design drawings, project briefs, and the design models were also examined. Due to practical limitations it was not possible to interview every participant, thus only the clients, departmental representatives, quantity surveyors, architects and project managers were interviewed. The structural and electrical engineers and contractors did not participate in the study, the major reason for this being that the rationale for the study was not on the construction of the building per se but on (process leading to construction) briefing. Interviewing clients (both sponsors

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and users) was necessary since they are the ones whose needs had to be satisfied in terms of the resultant building.

4. Description of the cases

The two cases selected for study comprised two major buildings on the University of Cape Town (UCT) campus.

4.1 Case 1 — New Chemical Engineering Building (NCEB), UCT

The NCEB is a modern structure situated on UCT's Upper Campus. The need for a new building arose because the original chemical engineering building's capacity (130 undergraduate and 12 post-graduate students) could not accommodate current student intake numbers. The project was initiated in 2002 and completed in 2004. The building generates 8300 assignable square metres and has the capacity to accommodate 450 undergraduate and 130 post-graduate students. The estimated budget for the project was R56.2 million.

The organisational structure for the NCEB project is depicted in Figure 3 below. The project organisational structure was partitioned into six levels. At the apex of the organisation was the University of Cape Town (UCT) council. The council acted as the client on behalf of the institution (UCT). It commissioned and governed the project and had the overall say over all decisions made at the lower levels.

Figure 3 shows that Level Two had two sections. The first one was the University Fund Raising Committee (UFC). The UFC was responsible for sourcing funds and monitoring fund raising projects. The second one was the University Building and Development Committee (UBDC). The UBDC dealt with the design development proposals that were brought by the design team. It was also responsible for assessing any major changes done by the design team to the design. In addition it was in charge of approving tender lists and made recommendations for tender approval by council. All construction progress and cost reports were handed to the UBDC on monthly basis.

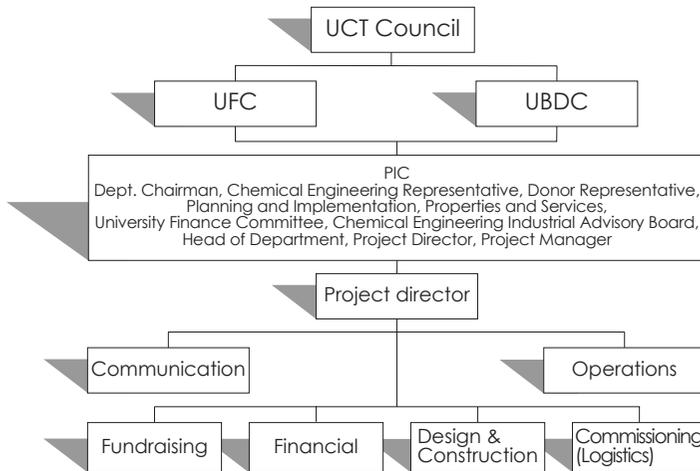


Figure 3: NCEB organisational structure

Level Three was made up of the Project Implementation Committee (PIC). The committee had users, the project manager and representatives from the Finance, Communication and Development (fund raising) departments. In essence, every lower level section had a representative in the PIC. The professional team would be invited on occasional basis. The PIC met on monthly basis. Its responsibilities were to make or endorse all major design decisions, review cost reports, prepare monthly reports to the UBDC and strategise fund raising. Essentially it ran the project. Decisions were reached through balloting. The fourth level constituted the project director who was in charge of running the lower sections. Thus the day to day issues from the communication, operations, fundraising, finance, design and construction departments were directly handled by the project director, pending monthly review by the PIC. There was also an external communication interface at this level which was responsible for public updates on issues such as donations made to the project. The fifth level was composed of the communication and operations sections. These oversaw the movement of information and events in the project and would report to the project director. The level below was, however, not accountable to these two departments as they would report directly to the project director. The sixth and last level was made up of sections that raised project funds, managed the project budget, designed and constructed the building and managed the project logistics. This is the level at which the design team was located.

4.2 Case 2 — The Institute of Infectious Diseases and Molecular Medicine (IIDMM), UCT

The IIDMM building houses a research institute, and is located on UCT's Health Sciences Faculty campus opposite Grootte Schuur hospital. The need for the building arose in the 1990's as a result of issues that were impacting negatively on the quality of research. It was thus hoped that the new structure would revitalise research activities. The project was initiated in 2001 and completed in 2005. The building generates 8000 assignable square metres and the approved budget was R45.2 million, which later rose to over R55 million.

The organisational structure of the project is depicted in Figure 4 below. It can be seen from Fig. 4 that the IIDMM project had five hierarchical levels. The first level was the UCT Council. The council was in charge of all major decisions such as approval of tenders on behalf of the university and the overall running of the project.

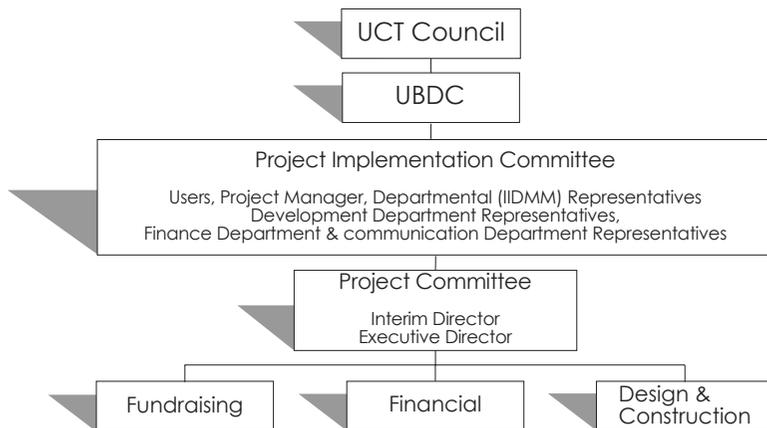


Figure 4: IIDMM organisational structure

The second level comprised the University Building and Development Committee (UBDC). The UBDC committee evaluated the designs, which were proposed by the design team, and any major design alterations. It was also responsible for endorsing tender lists and made recommendations to the UCT Council on tenders that were worth approval. Monthly progress and cost reports were handed to the committee during the construction stages. The third level was the Pro-

ject Implementation Committee (PIC). The PIC was comprised of representatives from all facets of the project. These included the Fundraising, Communication, and Finance sections. An internal academic person chaired the PIC. It ran the project and met on monthly basis to make major design decisions, organise and strategise fundraising, review cost reports, and prepare monthly reports for the UBDC. At the fourth level was the Project Committee. The project committee was composed of the project interim director and the executive director. This committee was responsible for running events that were 'occurring on the ground'. Thus, the fundraising, finance and design and construction sections reported directly to the project committee. The committee would, in turn, give monthly updates on cost and design to the Project Implementation Committee. The design team was located at Level 5.

A total of nine participants took part in the interviews in respect of both projects, comprised as follows:

- New Chemical Engineering Building: The interviewees for this project consisted of the project director, the academic departmental representative, the internal client, as well as an independent quantity surveyor, an architect and a project manager (an engineer). The three professional academics were selected for a number of reasons. Firstly, they participated in the project from brief development to completion. Secondly, they occupy offices within UCT buildings and have detailed knowledge of the students' and facility managers' needs.
- IIDMM Building: Here the interviewees consisted of the interim director, the internal client, an independent architect and quantity surveyor, as well as the project manager. Interestingly, the project manager and the internal client were each the same persons for both projects. Their views were considered important to facilitate an inter-project comparison.

The reason for interviewing one architect and one quantity surveyor from each of the two projects was twofold. Firstly, there was equal representation of views from both projects in terms of numbers. Second, they had taken a more active role in the briefing process than most of the other participants. The questions asked of the interviewees were put into four broad categories as follows:

- What is a brief and who should participate in developing the client's needs? The rationale was to see if the participants had

started off on the same level of understanding as far as knowledge of client needs; issues to be prioritised and the value of each member in developing the brief are concerned.

- How was the brief communicated to the design team? This question was raised to identify the media used to communicate the brief, the networks established to remit information, whether all members were briefed as a group or serially, and steps taken to ensure comprehensive understanding of the brief.
- How was information communicated between members? This question was necessary to identify barriers that impeded proper understanding of information and remedies that can be used to overcome such problems in future endeavours.
- What is debriefing and who should participate in the process? It was important to explore participants' level of awareness of the endeavour, who are the beneficiaries of the exercise, and more importantly, if participants did in fact conduct debriefing.

In addition, secondary sources were investigated for the cases under investigation. This involved the use of design documents, project briefs, and artefacts such as the design models. It was necessary to go through design documents to assess the extent to which they represented the brief.

5. General findings

The findings revealed that: firstly, even though participants seemed to have a shared understanding of a project brief, they had varied opinions of what constitutes a comprehensive brief. For instance, the IIDMM interim director and the IIDMM quantity surveyor believe that a brief should focus on the relationship between the building and the cost of construction. However, the NCEB project director asserted that equal weight should be put on all the variables (cost, time, space requirements, and client's objectives).

It should be noted that some interviewees were reluctant to provide detailed project-specific information, preferring to speak in generalities relating to the projects. The internal UCT client (for both projects) is of the view that, in the absence of project experience, other factors such as passion for the project (as was the case with IIDMM internal client), or adequate knowledge of a need (as was the case with the IIDMM interim director) are sufficient for an effective briefing process to occur. Interestingly, all interviewees agreed that, while

changes to the brief are to be expected, the brief should be frozen after the detailed design stage. It was also agreed that if changes to the brief are to be minimised, the design team needs to have sufficient time to resolve conceptual and detailed design issues. The quantity surveyors on both projects and the project director on the NCEB project commented that changes were more easily accommodated in terms of their effect on cost and time, if affected between the inception and detailed design stages rather than after this particular stage of design.

Clients' perceptions of barriers to effective understanding of the brief seem to differ from that of the design team professionals. The IIDMM interim director was unaware that the absence of a written brief had resulted in the design team requiring more time than usual to fully comprehend the nature and extent of the brief specifications. Committing project events to writing was regarded as a good way to enhance shared understanding. This observation came from the IIDMM project manager.

The major communication barrier faced by all of the design team members was the slow movement of information between the members of the team. Information management seems to be one way of ensuring speedy movement of messages. However, according to the IIDMM interim director, trade-offs need to be made between the monitoring information and the friction that the monitoring of information processes may cause between project participants.

All interviewees were aware of the need and desirability of conducting debriefing sessions at the completion of projects. The project organisational structures for the cases under investigation may be seen to be divisional and hierarchical in nature, rendering debriefing difficult in practice.

At first glance, the IIDMM project appeared to have over-run its approved budget of R45.2m by some R5m. A number of reasons readily explain this anomaly. Firstly, the initial approved budget concerned the refurbishment and alterations to the existing building. However, during the execution of the contract it was found necessary to demolish part of the building to facilitate extensions thereto. Moreover, the external works were considerably extended to provide parking facilities on level ground. When questioned about the apparent cost over-run, the interim director of the IIDMM project claimed that the financial changes were 'manageable' as the requisite funds 'were available'.

6. Discussion of the main research findings

6.1 What are the barriers to effective briefing?

The study revealed that the absence of written brief and written information in general impedes understanding of information. In some projects the brief is passed serially from the client to the design team members. Thus, most of the design team members receive brief information indirectly. Serial presentation of information implies different environments and contexts, which has an influence on the communication process. Recipients are less likely to comprehend the brief in the same way, giving rise to gaps in perception. The unclear articulation of needs and a lack of detail results in the design team taking lengthy periods to comprehend the client's requirements, prolonging the design phase of the project. Constant 'panel-beating' of the client's needs also hampers the progress of design. The practice of having a Project Implementation Committee may be seen to be problematic since the absence of one of the members sometimes means that decisions cannot be finalised promptly.

6.2 How can the communication of briefing information be improved?

All interviewees emphasised the need to commit project events to writing and to use verbal communication as the sole means of communication, cautiously and sparingly. All interviewees expressed the need for professional assistance in brief formulation and regarded it as desirable that the client be accessible to all design team members and considered it undesirable that the architect or project manager should act as 'gatekeepers' to the client. They also advocated the importance of efficient information management and a sufficient supply of information, as this increases the likelihood that the right person will receive the right information at the right time. Some interviewees regarded the anticipation of changes and the prior formulation of alternative 'Plan B' approaches as important.

6.3 What steps can be taken to develop a shared language between design team members?

There was general consensus among the interviewees that the issue of conflicting languages and cultures is largely a result of team members not taking the trouble to learn about each other. The perceived solution was to encourage design team members to socialise infor-

mally prior to the commencement of the project. In addition, the view was expressed that the use of drawings and figures with (written or oral) explanatory notes is one route to follow to facilitate shared understanding. Interviewees were in agreement that, for the attainment of shared meaning during the briefing process, it is the responsibility of both senders and receivers to engage in effective interpersonal communication.

7. Conclusions

This research has illustrated that even though there is, at a general level, understanding of the importance of the briefing process amongst construction professionals in South Africa, the practice of briefing is very project specific and lacking in consistency. For instance, inconsistencies exist in the manner in which clients pass on the brief to members of the design team. In the NCEB case study clients communicated the brief in written and oral format, and in the IIDM case, the technical brief was presented in written format and the balance was orally presented. Despite the inconsistencies in the choice of medium when presenting the brief, there was acceptance of the need to exchange information in written format. At present this appears to be done mainly via the use of notes and other explanatory documents relating to the project.

One way in which design team members can demonstrate their understanding of the brief is by way of face-to-face feedback meetings with the client where they present a briefing report for sign-off by the client. This report should encapsulate the understanding by the design team of the nature and extent of the client's needs. Acceptance of this document by the client is then taken as explicit acceptance of the design team's interpretation of the client's brief.

There is evidence in the cases under investigation of the slow movement of information between design team members. Given the fact that most events on projects are arranged sequentially i.e. they are task dependent, information delays can cause overall delays. Thus, information management is one aspect of design team communication that requires careful monitoring and control.

There is a gap between practice and the participants' knowledge and appreciation of the debriefing process. Debriefing, which is essential for the attainment of shared meaning and service improvement, was not done on either of the cases studied.

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