

# FROM BRIEFING TO CLIENT REQUIREMENTS PROCESSING

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The briefing process in construction, which is used to communicate client objectives for a project, is an evolutionary process where design is used to clarify client requirements. This approach implies that a solution is formulated from a hazy understanding of client requirements, and therefore has the potential of shifting focus from the client to the preferences of the designer(s). However, to ensure that construction is more client-oriented, there should be rigorous processing of client requirements before the start of conceptual design. This should be done through a structured framework which provides for the definition, analysis and translation of client requirements into design specifications that are solution neutral. This paper describes how this can be done through a Client Requirements Processing Model which is based on Quality Function Deployment, a technique used in manufacturing to translate customer requirements into appropriate product features. Client requirements processing enables a better understanding of client requirements, facilitates design innovation, and enhances the success of integrated procurement strategies (e.g. design and build) which require clear and unambiguous briefs as a very early stage. It also provides a necessary first step for ultimate client satisfaction through the effective encapsulation of client requirements in the design and construction process.

Keywords: briefing, client, construction, processing, requirements.

## INTRODUCTION

The recognition that clients are the driving force in the construction industry has led to repeated calls for the construction process to be more client-oriented (Bennett *et al.* 1988, Latham 1994, Howie 1996). However, there are indications that the needs of clients are not being fully met by the industry. The latest UK government report on “Rethinking Construction” (Egan 1998) reports that more than a third of major construction clients are dissatisfied with the performance of the industry in providing value for money, and in delivering high-quality facilities within the quoted price, and on time.

The need to satisfy the demands of clients, who are increasingly becoming more sophisticated, requires an overall improvement to the efficiency of the construction process. Although targets of up to 30% reduction in costs, for example, have been recommended (Latham 1994), it is suggested that, improvements in the construction process could be brought about by a renewed focus on: the requirements of construction clients, the development of committed leadership, integrated processes and teams, a quality driven agenda, and commitment to people (Egan 1998).

**Table 1:** Details of organizations involved in case studies

Organi- zation	Type of business	No of employees	Annual turnover	Project/property portfolio	Basis of case study
A	Airport company	8000	£1,200m	£500m annually on new/improved facilities	Organizational briefing process
B	Charity	5000	£100m	Manages over 850 properties (including 300 high street shops)	Organizational briefing process
C	University	1600	£51m	88000 m <sup>2</sup> of floor space: £2.5m to £15m annually on its estate	Specific project (building project)
D	Architect- ural firm	180	£5m	Involved in about 400 projects annually	Organizational briefing process

This paper focuses on the need for renewed focus on client requirements, particularly at the initial stage in the construction process, the briefing stage. It is argued that, for focus to be maintained on the requirements of the client, there should be effective ‘processing’ of client requirements before conceptual design. This is however, not adequately catered for within the current framework for briefing. Following a discussion of the nature and limitations of the briefing process in construction, the paper goes on to describe a methodology that is designed to facilitate the effective processing of client requirements in construction.

## THE BRIEFING PROCESS

The briefing process involves the elicitation and communication of client (and other project) requirements. The document which contains these requirements – the ‘brief’ – is the medium for expressing the objectives and needs of the client (Goodacre *et al.* 1982, Bennett *et al.* 1988, CIB 1997). There are basically two main types of brief:

1. *strategic (or outline/initial) brief*: this sets out the broad scope and purpose of the project and its key parameters including overall budget and programme (Worthington 1994, Construct IT 1996, CIB 1997);
2. *project (functional) brief*: this is a full statement of the client’s functional and operational requirements for the completed project. It converts the strategic brief into construction terms and can consist of various sub-briefs (e.g. fit-out brief for fittings and furnishings, space-planning brief, etc.) (Salisbury 1990, CIB 1997).

### The development of briefs

Various factors influence the way briefs are developed. These factors are related to the information required, and they include: the nature of the project, type and size of client, and the skills of those involved in the process (Newman *et al.* 1981, Worthington 1994). Complex projects require much more information, involve many multi-disciplinary professionals, and may therefore present greater challenges for briefing. Similarly, inexperienced client organizations, also find it relatively difficult to define their requirements in briefing.

To establish how briefing is carried out in practice, a case study of four organizations (Table 1) was conducted. The choice of these cases was solely based on the willingness of individuals within these organizations to collaborate and make data available to the research project. Data collection for these case studies was carried out using semi-structured interviews. The following approach was generally adopted:

- initial contact with interviewees;

**Table 2:** Findings about the briefing process

<b>Briefing process</b>	<b>Findings</b>
Those involved in briefing	a broad mix of professionals (both within and outside the client organization) are involved in briefing; they include: administrators (managers), architects, development managers, engineers (building services, civil, structural), planning supervisors, portfolio managers, project managers, quantity surveyors (QS), etc.; design professionals (e.g. architects however, tend to dominate the briefing process.
Stages in briefing	briefing is combined with design (i.e. conceptual and scheme design), and usually, there are no distinct stages in the process; briefing information becomes more detailed as design progresses.
Collection and documentation of information	a variety of methods are used to collect information: e.g. interviews, workshops, evaluation of existing facilities, visits to similar facilities, etc.; information collected is sometimes documented in formal documents (e.g. letters, faxes, e-mail, minutes of meetings, sketches and drawings, etc.); these documents are not normally stored as part of 'the brief', and usually, design team relies on recollections of verbal communications with the client.
Processing of information	a process of 'trial and error', through the use of sketches and drawings, is mostly used to clarify the client's problem, or process briefing information; there are situations, however, where clients who commission many projects, define their requirements before design.
Decision-making in briefing	decision-making involves the resolution of competing interests between different groups within the client body, and between professionals with diverse perspectives; decisions are usually the result of discussions and negotiations between those involved; techniques such as value management are used to assist in decision-making.
Management of the briefing process	management of changes to requirements is influenced by the way requirements are represented in subsequent stages of the briefing and design process; changes to requirements are managed by recording them as corrections to sketches and drawings, the main medium for representing the brief; changes may also be discussed in meetings and decisions recorded in the reports (minutes) of those meetings.

- in-depth interviews which were recorded on tape;
- review of relevant documents supplied by interviewees;
- further discussions (usually over the phone) to clarify any difficulties;
- report writing, comments and amendments to report.

The case studies were complimented by a questionnaire survey of a random sample of 63 client organizations and 84 consulting firms (architects, civil engineers, quantity surveyors). Because of space limitations, the results of the questionnaire survey are presented elsewhere in Kamara (1999), but they contributed to the findings on the briefing process summarized in Table 2.

### **Limitations in current briefing practice**

The findings from case studies and the survey provided an insight into the problems in current briefing practice. They include the following:

- inadequate involvement of all the relevant parties to a project;
- insufficient time allocated for briefing;
- inadequate considerations of the perspectives of the client;
- inadequate communication between those involved in briefing;
- inadequate management of changes to requirements.

These problems, which are supported by other studies on briefing (e.g. Newman *et al.* 1981, Goodacre *et al.* 1982, Barrett 1996, Construct IT 1996), may be due to the attitude or inefficiencies of those involved, but they also suggest that the general framework for briefing is inadequate.

### **Limitations in the framework for briefing**

Current briefing practice deals with the collection of information for project implementation, and often, project requirements are taken to be the same as client requirements. However, project requirements are of many types (e.g. client, user, site, environmental, regulatory, design, construction, and life-cycle). Client requirements combine with site, environmental and regulatory requirements to produce design requirements, which in turn generate construction requirements. Other project requirements can either pose constraints to client requirements, or they can enhance their satisfaction. An adequate understanding of client requirements can therefore be achieved if they are considered distinctly from other project requirements. However, if they are considered together, as in current practice, there is the tendency for other requirements (e.g. those of the site) to overshadow client requirements: a case of ‘the tail wagging the dog’.

Using the solution (i.e. design) to clarify the problem, can also shift focus from client requirements to the preferences of designers. This is because, proposed solutions are usually made before a thorough understanding of the client’s requirements. There is therefore an inherent tendency for the client to be influenced by the preferences of the designer(s). This in itself may not be disadvantageous to the client, who relies on the expertise of the designer to provide a design solution to his or her problem. However, since the solution is based on a partial understanding of the problem, the requirements of clients may take second place to that of designers. Furthermore, this practice assumes that a design professional has to lead the briefing process. However, designers are not necessarily good brief writers since briefing is mainly concerned with the processing of information (Palmer 1981). The assumption that a design professional has to lead the briefing process is also at odds with alternative forms of working, such as design and build, and management contracting (Winter 1989).

It is therefore evident that the framework for briefing does not guarantee continued focus on the client, and many briefs, according to Howie (1996), are generated out of design rather than a clear understanding of the client’s actual objectives. What is required is an effective means for processing client requirements.

## **CLIENT REQUIREMENTS PROCESSING**

Client requirements processing refers to the definition, analysis and translation of explicit and implicit client requirements into solution-neutral design specifications. It involves a structured process which facilitates the description of the facility that satisfies the business need of the client. The description is not based on the physical components of the facility (e.g. shape, materials, etc.) but on its functions, attributes, acquisition, operation, disposal, and effects on people and the environment. It also does not include other project requirements (such as site information), but focuses exclusively on the business need of the client.

### **The need for client requirements processing**

The need for client requirements processing arises from the nature of client requirements, and the interactions between multi-disciplinary teams involved in a project.

A client represents different perspectives. These include the perspectives within the organization of the paying client (e.g. different departments), those of various user groups represented, and other stakeholders (e.g. neighbourhood association). If the paying client is a consortium comprising different organizations, the perspectives of these organizations would also have to be taken into consideration. A thorough understanding of client requirements can therefore be achieved through effective requirements processing. Requirements definition ensures that all the major perspectives represented by the client are identified. Analysis ensures that the various perspectives are rationalized, organized (into a hierarchy based on level of detail) and prioritized with respect to the importance of each requirement.

The interactions between different members of a project team is also another reason for processing client requirements. This is because, the focus, perspective and orientation of each discipline (and members of the team) is usually different. Therefore, to enable these disciplines to work collaboratively in the project development process, the following are required:

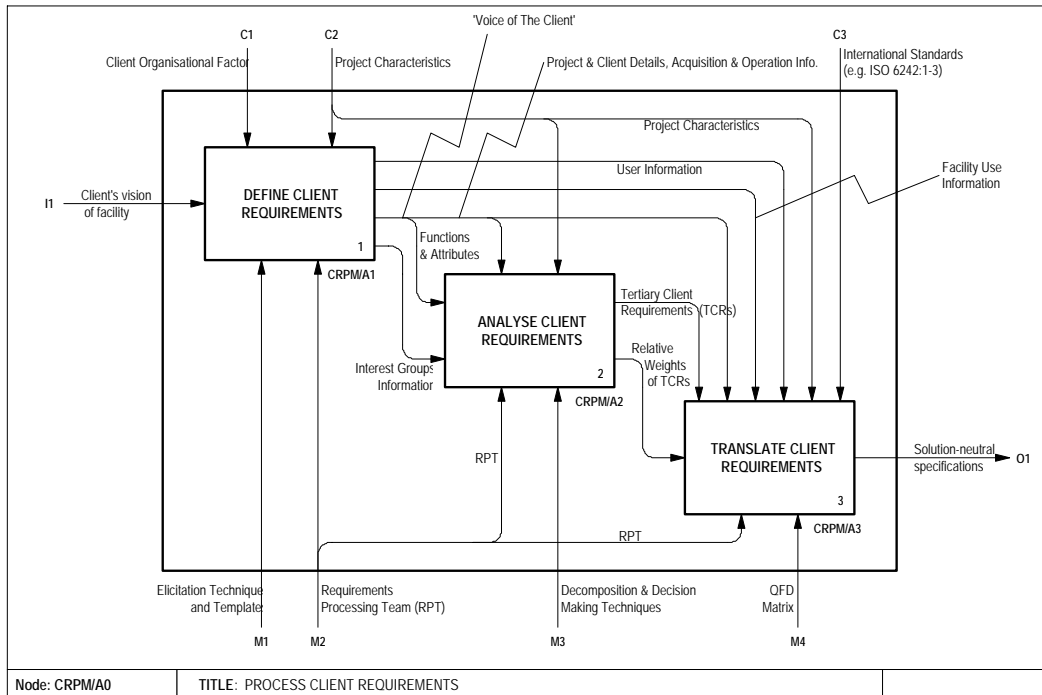
- clearly defined requirements, which are unambiguous, and which are understood from the perspective of the client (not those of the different professional disciplines);
- requirements which are stated in design terms, within the context of other relevant project requirements;
- a mechanism for managing the inevitable changes to requirements, and for tracing and correlating the history of design decisions to the original and evolving requirements of the client;
- a process that ensures that focus on the client is maintained throughout.

The above conditions can be satisfied by the effective processing of client requirements within a client requirements processing model.

### **The client requirements processing model**

The Client Requirements Processing Model (CRPM) was developed using an iterative process involving detailed analysis and discussions with industry practitioners, and various members of the academic community. The CRPM is based on Quality Function Deployment (QFD), a matrix-based methodology which is used in manufacturing for translating customers' required quality characteristics (i.e. wants, needs and desires) into appropriate product or service features (Mallon and Mulligan 1993). In QFD, multi-functional teams are used to identify, incorporate and deploy the 'voice of the customer' during the product development process. Other tools and techniques are also used in the CRPM (Kamara *et al.* 1998). These include:

- elicitation tools (e.g. interviews, group discussions) to facilitate the elicitation of requirements from the client(s);
- decomposition techniques (e.g. value tree analysis) to facilitate the structuring of requirements into primary, secondary and tertiary requirements, for better clarity;



**Figure 1:** The context diagram for the CRPM showing the main stages of the model

- decision-making tools (e.g. criteria weighting) to facilitate the prioritization of the perspectives represented by the client, and his or her requirements.

### Description of the client requirements processing model

The CRPM is described using the IDEF-0 modelling method (IDEF 1993). The basic notation of IDEF-0 consists of boxes and arrows. A box represents the activity (function) and the arrows represent inputs (left side of box), outputs (rights side of box), controls (top of box) and mechanisms (bottom of box) (IOCM). Inputs are converted into outputs through the activity represented by the box. The controls serve as constraints for the activity, and the mechanisms are the means (tools) for carrying out the activity. Figure 1 provides a representation of the main stages of the CRPM which are described below.

*Define client requirements stage:* At the “define client requirements” stage (activity box number 1 in Figure 1), the project context and interest groups represented by the client are identified, and client requirements are elicited. The input for this activity is the ‘client’s vision of the facility’ (i.e. statements from the client about what is required of the proposed facility), which is converted into the following outputs: ‘user information’, ‘facility use information’, ‘interest groups information’ and the ‘voice of the client’ (consisting of: ‘functions and attributes’ for the facility, ‘project and client details’ and ‘acquisition, operation and disposal information’). The controls, ‘client organizational factors’ (i.e. overall framework of the client organization) and ‘project characteristics’ (i.e. type of facility, and the nature of the project) provide the context for defining client requirements. ‘Elicitation techniques’ (questionnaires, group consultations, etc.) and the ‘requirements processing team’ are the mechanisms for the “define client requirements” activity, which is further decomposed into three sub-functions: “define project context”, “identify client interest groups” and “elicit client requirements”.

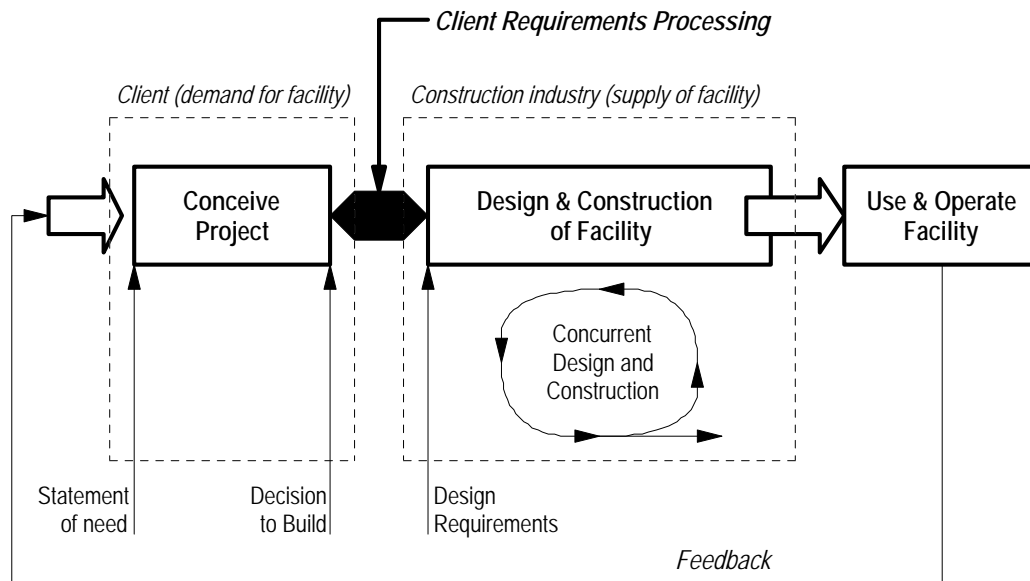
*Analyse client requirements stage:* The “analyse client requirements” activity (box number 2 in Figure 1) deals with the structuring (into primary, secondary and tertiary requirements) and prioritization of (tertiary) client requirements based on the relative importance interest groups place on those requirements. The inputs for this activity are: ‘functions and attributes’ of the facility, and ‘interest groups information.’ These are converted by the “analyse client requirements” activity into the following outputs: ‘(primary, secondary and) tertiary client requirements (TCRs)’ and ‘relative weights of TCRs.’ The controls are: ‘project and client details’, acquisition and operation information’ and ‘project characteristics.’ The mechanisms for this activity are: the ‘requirements processing team’ and ‘decomposition and decision-making techniques.’ The “analyse client requirements” activity is decomposed into three sub-activities: “structure client requirements”, prioritize interest groups” and “prioritize tertiary requirements.”

*Translate client requirements stage:* The “translate client requirements” activity (box number 3 in Figure 1) deals with the translation of client requirements into design attributes (e.g. ‘gross floor area’, ‘air flow velocity’, etc.). It involves the generation of design attributes, determination of target values (for design attributes), translation of client requirements into design attributes, and the prioritization of design attributes. The translation process involves associating tertiary client requirements with generated design attributes (DAs) using the QFD ‘house of quality’ matrix. For example, a client requirement for ‘pleasant internal environment’ can be associated with any, or a combination, of the following design attributes: ‘air flow velocity’, ‘mean radiant temperature’ and ‘sound pressure levels’. The target values (e.g. gross floor area of 2500m<sup>2</sup>) are intended to define a solution space for the design attributes, and their determination depend on the controls for that activity (i.e. ‘user information’, ‘facility use information’, etc.). The strength of the relationship between a requirement and a design attribute can be represented by 9, 3, 1, 0 for strong, medium, weak, and no relationship respectively. This is used, together with the relative weights of tertiary client requirements, to determine the absolute and relative weights of each design attribute. The output of the “translate requirements” activity is ‘solution-neutral specification.’ This comprise of the following: design attributes (translations of tertiary client requirements), relative weights of design attributes (indicating the level of importance) and the target values for design attributes (solution space). The sub-activities which form part of the “translate client requirements” activity are: “generate design attributes”, “determine target values for design attributes”, “evaluate relationships between TCRs and DAs” and “prioritise design attributes.”

### **Implementation of the CRPM**

Figure 2 shows the context of the client requirements processing model within the construction process. The CRPM serves as the interface between the client’s business needs and design requirements. It is performed *before* creative design (i.e. concept and scheme design). The outputs from the client requirements processing activity can facilitate a multi-disciplinary design team to work collaboratively, and can serve as the basis for adopting a particular procurement/contract strategy.

Space restrictions do not permit the inclusion of an example of how the model could be implemented in practice. However, the model has been tested using the requirements for a building project, the results of which are reported in Kamara *et al.* (1999). A prototype software for the model (CLIENTPRO) was also developed as a Microsoft Access application, and was evaluated by selected professionals from the



**Figure 2:** Context for implementing the client requirements processing model

construction industry: an architect, a civil engineer, a project manager, and a planning and quality control manager. The evaluation followed a demonstration of a run of CLIENTPRO using the requirements for a building project. The general impression of evaluators was that, the prototype is “an excellent tool to crystallize client requirements into a clearly defined and prioritized document” (Kamara 1999).

## DISCUSSION

The discussion of the briefing process and the model for client requirements processing presented in this paper, have considered the ‘brief’ (as defined previously) as an input to the creative design process, and that, ‘briefing’ primarily deals with the processing of information (Sharpe 1972, Palmer 1981). The focus has therefore been on the ‘representation of information’ in a manner that maintains focus on client requirements. It is however recognized that briefing is usually considered to be part of the creative design process (Worthington 1994, CIT 1996, CIB 1997) and attempts to ‘systemize’ the way it is carried out cannot always be valid since the design process itself is complex and does not always evolve in a systematic manner (Sharpe 1972, Lawson 1997). But since the approach proposed in the CRPM results in solution-neutral specifications, it is argued that this would not interfere with the creative process, and indeed can enhance it. Sharpe (1972) suggests that the arrangement (or processing) of information in a meaningful way can serve as the basis for design synthesis, and can help in the ‘incubation’ of creative design ideas. Thus, the CRPM (and ClientPro) can be useful in:

- helping clients to clarify their vision of the facility to be constructed;
- facilitating communication and a common understanding of the client’s requirements among members of the requirements processing team, and subsequently, those of the design team;



- enhancing collaborative working since there is a common understanding of the client's requirements among members of the design team;
- facilitating design creativity since client requirements are translated into a solution-neutral format;
- minimizing uncertainties which may arise because of an unclear definition of client requirements;
- minimizing downstream problems due to early consideration of issues affecting the life-cycle of the proposed facility;
- providing the basis for effective requirements management throughout the project life-cycle;
- ensuring that focus on client requirements is maintained.

It should be noted that the consideration of all the perspectives represented by the client body is only possible through the co-operation of the paying client who commissions the design and construction of a facility. It is however in the interest of the client for all these perspectives to be considered early in design, otherwise the operation and use of the facility will be adversely affected. The use of a requirements processing team (RPT) (separate from a design team) can also allow adequate time to be spent on defining client requirements. Unlike current practice, where briefing is combined with design, there will be little pressure on the RPT to meet design deadlines, which is usually the reason why insufficient time is being allowed for briefing. In fact a number of consulting firms (such as Organization D in Table 1) already offer briefing services to clients which do not involve design (RIBA 1997), and can therefore utilize the CRPM in defining the requirements of their clients.

## CONCLUSION

This paper has discussed the current process of briefing in construction, and has demonstrated that it does not guarantee continued focus on client requirements. An alternative approach to ensure that construction is more client-oriented in the early stages of the process, and a methodology for accomplishing this within a client requirements processing model, have also been described. It was further established that, the effective processing of client requirements can ensure continued focus on the client, and is of benefit to both the client and the entire construction process.

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