Kamara JM.
Maintaining focus on clients’ requirements using the DQI tool: Towards a requirements-oriented project process.
*Built Environment Project and Asset Management* 2017, 7(3), 271-283

Copyright:
This is the authors accepted manuscript of an article that has been published in its final definitive form by Emerald, 2017

DOI link to article:
http://doi.org/10.1108/BEPAM-09-2016-0044

Date deposited:
27/04/2017

Embargo release date:
01 July 2018
Maintaining Focus on Clients’ Requirements Using the DQI Tool: Towards a Requirements-Oriented Project Process

ABSTRACT
Purpose:
This paper explores the contribution of the Design Quality Indicator (DQI) tool in the management of client requirements in construction projects, and proposes a Requirements Oriented Project Process (ROPP) to ensure continued focus on client requirements throughout the lifecycle of a project.

Design/methodology
Direct participant involvement and case studies of building projects that have used the DQI tool are used to analyse the extent to which DQI contributes to the management of client requirements.

Findings
Case study analysis suggests that the DQI enhances focus on client and project stakeholder requirements through the initial quality aspirations set out at the beginning of a project, but it is limited in its scope to address a more comprehensive requirements profile.

Research limitations/implications
The proposed ROPP model is conceptual and requires further development to test its effectiveness in enhancing focus on client requirements. However, given current developments in automated checking in BIM and other environments, this offers scope for further research in this area.

Originality/value
Maintaining focus on client requirements throughout the process is a key criteria for project success. However, given the many stakeholders involved, and the progressive translation into various project documents, there is a risk that focus on the original/evolving requirements of the client can be lost. Current approaches such as the DQI have limitations and a robust ROPP is therefore a key contribution to securing clients’ objectives over the project lifecycle.

KEYWORDS: client requirements, construction projects, DQI, requirements management, requirements-oriented project process

Article Classification: Research Paper

INTRODUCTION
This paper addresses the broad question of how focus on client requirements is maintained over the lifecycle of a construction project, such that the end result truly reflects their wishes. In this context, the “client” refers to “the party commissioning the design and construction of a project...” (RIBA, 2013).– i.e. the ‘buyer of construction services’ providing the official link with construction professionals and representing other interests (e.g. owner, users and other interest groups) within and outside the client organisation (Kamara et al. 2002; RIBA, 2013). “Requirements” refer to the objectives, needs, wishes and expectations of the client; a description of the functions, attributes or other special features of the facility that will satisfy the client’s business need for commissioning a construction project (Gause and Weinberg, 1989). “Project lifecycle” here refers to the inception, design, construction, and handover phases of a project.

“Focus on client requirements” suggests a project process that has robust mechanisms to secure the objectives of the client throughout its lifecycle (Kamara, 2008). The question of why this can be an issue arises from the nature of client requirements, the project context, and limitations of current approaches to address the issue. Firstly, client requirements are about the end product, although contextual factors such as budget, client organisation characteristics, and site, are often included in a
briefing document. When contextual factors are included, this becomes requirements for design or project implementation although these are sometimes referred to as ‘client requirements’. Thus client requirements are about the need, whilst design/project requirements are about the problem definition to meet that need. This distinction is important because while client requirements cannot be implemented without contextual factors, these can either enhance or pose constraints in their implementation. For example, a particular site might enhance a client’s business activities because of its location, but might also pose constraints with respect to specific ground conditions, planning restrictions on the site and so on. The risk for contextual factors to obscure client needs over the course of a project, necessitate special effort to maintain focus on client requirements. Secondly, while construction projects are aimed at meeting clients’ requirements (CIOB, 1998), their implementation involves different stakeholders both within the client organisation (e.g. different departments) and external to it (e.g. project manager, external bodies) (Newcombe, 2003; Davis, 2014). Their success is also not only linked to clients’ organisational business strategy, but to other considerations such as cooperation/collaboration and benefits to stakeholders (Atkinson, 1999; Cooke-Davies, 2002; Davis, 2014). The nature of the client organisation, competing needs of other stakeholders, and criteria for success therefore raise the question on how focus is maintained on client requirements. Thirdly, current mechanisms for managing client requirements, which involve the development of a series of briefs (e.g. strategic, initial and final project briefs) with client sign-off of design and other decisions at key points in the process (ISO, 1994; RIBA, 2013) are heavily reliant on manual and paper-intensive methods (Yu et al. 2010; Jallow et al. 2014). The active development of briefs is only confined to the early stages of a project (RIBA, 2013), and client requirements become embedded in various design documents (Ryd, 2004). Subsequent changes to the design based on previous design solutions “...can lead to an end result which is significantly different from the documented client requirements” (Kiviniemi, 2005). Manual changes to design requirements are also error prone since designers do not systematically document the rationale behind changes. It is therefore difficult to track design changes and links to client requirements, over time (Kim et al. 2015).

Given the limitations of existing mechanisms, how then can focus on client requirements be maintained? The review above suggests that: firstly, it is necessary to ensure client requirements do not get confused with contextual factors and that they are still identifiable within the design/project documents in which they become embedded. Secondly, it is also necessary to have a robust system for documenting requirements, tracking and managing change in requirements, and for checking how changes affect design/project decisions and activities. Thirdly, the growing use of BIM and other digital project tools, suggest that client requirements need to be represented in ways that allow interoperability with other design and project applications. The principles of Requirements Management (RM), a concept from Systems/Software Engineering, offer possibilities for maintaining focus on client requirements (Fernie et al. 2003). RM is a process for “keeping requirements usable and up to date throughout the project process” (Kim et al. 2015: 103) and relies on the use of formal methods to define, analyse, track and verify requirements (Fiksel and Hayes-Roth, 1993), with commercial applications such as RequisitePro (IBM, 2016) providing support for such methods. Research by Kiviniemi (2005); Ozkaya and Akin (2006, 2007); Jallow et al. (2014); and Kim et al. (2015) are examples of how RM might be applied to construction. However, RM techniques tend to present a positivist view to requirements which assumes that requirements are completely identifiable and specifiable at the outset, contrary to the architectural design process, which can be fluid and iterative. RM therefore needs to include a behavioural dimension, where soft facilitation skills are combined with formal software methods, to be suitable in architectural/construction projects (Fernie et al. 2003).

Against this background, this paper explores the contribution of the Design Quality Indicator (DQI) tool to maintaining focus on client requirements over the lifecycle of a project, with a view to proposing a Requirements-Oriented Project Process (ROPP) that can facilitate this. An overview of DQI is presented. The research method adopted, and case studies on the use of the DQI are presented and discussed. The paper concludes with a proposed ROPP and recommendations for future research.
DESIGN QUALITY INDICATOR (DQI) TOOL

The DQI tool was developed in the UK by the Construction Industry Council (CIC) and was launched in 2002. It facilitates the definition and assessment of design quality indicators and priorities for buildings by a cross-section of project stakeholders. It adopts a rational-adaptive approach to assessment as opposed to a purely judgement based approach which relies on the intuitive judgements of experts, or a purely rational ‘manage and measure’ approach that relies on benchmarks and performance indicators (Gann and Whyte, 2003). Quality in the DQI is defined with respect to Functionality (the way the building is designed to be useful), Build Quality (construction and performance of the building), and Impact (the building’s ability to create a sense of place and a positive effect on the local community and environment). Functionality is expressed in terms of: access, space and uses; Build Quality in terms of: performance, engineering and construction; and Impact in terms of: urban and social integration, internal environment, form and materials, and character and innovation. There are three versions of DQI: a standard tool for most building types, DQI for Schools (DQIfS), and DQI Health.

Structure of DQI Tool

A standard set of questions (DQI questionnaire) is used to define and assess project aspirations and priorities. Examples of questions include: “the spaces in the buildings should be the right size for their functions”, “the internal environment should meet recommended standards”, “the building should enhance and uplift the neighbourhood”. There are 99 questions in the standard DQI, 113 in DQIfS and 71 in DQI Health. The questionnaire is organised around Functionality, Build Quality and Impact with a total of ten sections to reflect the subdivisions for each category. Using the DQI tool requires an independent CIC-approved Facilitator who is trained to run DQI workshops. Participants to a DQI workshop include the DQI Leader (a key member of the project team) and a cross-section of stakeholders (Kamara, 2013).

Process and Stages in DQI Assessment

There are five stages in the DQI process (Table 1): Briefing, Concept, Mid Design, Ready for Occupation and In-use, which respectively correspond to Stages 0/1, Stages 2/3, Stage 4, Stages 5/6, and Stage 7 of the Royal Institute of British Architects’ (RIBA) Plan of Work (RIBA, 2013). At the Briefing Stage, key priorities and aspirations are established by discussion and consensus. Each of the statements in the DQI questionnaire is prioritised by assigning a “Required”, “Desired”, “Inspired” or “Not Applicable” tag to it. A “Required” tag (e.g. to the statement: “the spaces in the building should be the right size for their functions”) indicates that minimum standards and regulations will satisfy that aspiration. A “Desired” tag indicates a design intervention beyond minimum standards, or that there are no defined minimum standards. An “Inspired” tag suggests design innovation that is way beyond minimum standards. The expressed priorities from the Briefing Workshop are recorded in the online DQI Briefing Record in the form of a ‘Target Line’ (line graph in Figure 1a) and an updated profile of questions with indications of ‘measures of success’ for key statements in the standard questionnaire. Each DQI workshop includes a presentation on DQI, an overview of the project, and where relevant, a summary of previous aspirations and decisions. The DQI Facilitator prepares a report for each workshop. This is forwarded to the DQI Leader, who circulates the report to different stakeholders as appropriate.

Assessment of Client Priorities

[INSERT TABLE 1 HERE]
The outputs from the DQI Briefing Stage become the basis for assessing the design and completed building in subsequent stages, using the same (but slightly modified) set of questions in the DQI questionnaire (e.g. the statement on spaces mentioned above becomes: “the spaces in the building will be the right size for their functions”). However, instead of assigning tags, each participant rates each statement by selecting one of eight options on a Likert scale (strongly disagree, disagree, tend to disagree, agree, strongly agree, not applicable, and don’t know). The assessment can be done on paper or directly online, with the results captured on the online DQI tool to compare with the Briefing Record Outputs. The scores of each participant are aggregated and reported in various output graphs (Figure 1). The Briefing Record Score (Figure 1a) compares the results from the DQI assessment with the Briefing Record Profile. The line graph is the target line and represents the maximum the design can achieve. The vertical bars are the results from the assessment and the height of each bar is an indication of how well that aspect of the design or building has been judged against that target. The Section Score (Figure 1b) displays on a scale of 0-6, the average of respondents’ scores for each section and shows the overall approval of the design or building. The Weighted Section Score (Figure 1c) aggregates respondents’ satisfaction against the weightings allocated to all sections. The overall length of each bar shows the relative importance of each of the ten sections in the questionnaire, with the green portion showing how well the design is performing in each section. The Quality Dimension (Figure 1d) shows the overall weighting allocated to Functionality, Build Quality and Impact on a scale of 0 to 100% and sets these against the responses made to statements in each category.

Figure 1: DQI Output Diagrams (compiled from DQI (2014) p. 9 & 10)
RESEARCH METHODOLOGY

This research focused specifically on the DQI tool since it is the only known tool that combines facilitation skills and an online software to define and assess stakeholder requirements over the course of a project, and the fact that the author already has experience of its use as a facilitator. The key question that the research sought to address was: “to what extent does the DQI tool enhance focus on client requirements over the lifecycle of a project?” Given that the DQI was not specifically designed for managing client requirements in this way, the nature of the research is exploratory, with a view to discover insights into the contribution (or not) of DQI in client requirements management. Exploratory research is interpretivist in nature since understanding is developed from the researcher’s frame of reference (Fitzgerald and Howcroft, 1998). A qualitative, case study approach, which usually operationalizes interpretivist research was therefore adopted.

Two case studies of building projects in the UK (A and B) where the author had involvement as an external DQI facilitator are presented here. The cases were selected because the DQI tool was applied multiple times over the course of the project. Data collection was primarily through direct participant observation and evidence from workshop reports prepared by the author. The DQI workshop process involves discussions with key stakeholders and review of key project documents such as the brief, project programme, and stakeholders; thus adequate insight was gained about key issues around both projects. The analysis of data derived from workshops was done using the DQI software tool, but for the purpose of this paper, it is based on analysis of workshop reports.

It is acknowledged that although case study research is limited in the ability to make generalisations, the insights gained can be applied to other contexts (Abowitz and Toole, 2010; Taylor et al. 2011). In this particular case, insights for examining the contribution of DQI to maintaining focus on client requirements can inform the development of a requirements-oriented project process.

CASE STUDIES: DETAILS OF DQI USE AND OUTPUTS

Project A was a collaborative project between three Fire and Rescue Authorities (FRAs) to construct six new buildings: five Community Fire Stations and one headquarters building, which was procured under the Private Finance Initiative scheme. DQI was used to develop consensus among various stakeholder groups and develop a Briefing Record that was to be used to assess aspects of the technical and design proposals for the project. The first workshop was held four years after the start of the project, with the number of bidders having been reduced from eleven to three.

Project B was a new build replacement primary school on the same site with a budget of £7.2m. The objective was to bring about educational transformation, and be sustainable (e.g. 60% reduction in CO₂ emissions and achieving BREEAM excellent). It was traditionally procured, and DQI was used because it provided a structured assessment process that will feed into the BREEAM assessment for the building. Prior consultations had been held with different stakeholder groups before the first DQI workshop.

Table 2 shows details of DQI use in both projects. Key output graphs are presented in Figure 2.
Discussion

DQI and Maintaining Focus on Client Requirements
This paper has considered the broad question of how focus on client requirements can be maintained over the course of a project, with a specific focus on the extent to which the DQI tool supported this process. The two case studies show that DQI can be used in different types and scales of projects and even as an aid to bid evaluation. The feedback from participants at each workshop in both projects was positive with comments such as: “great benefit in relating end user inputs to original aspirations”; “a good tool to provide stakeholders’ thoughts and impressions throughout the project” (In-use workshop, Project A); “this was a good session because the children and adults need to know what the school will be like” (mid-design workshop, Project B). Its appropriateness however, was with respect to its intended use as an assessment tool. But how relevant is DQI in maintaining focus on client requirements against the conditions for achieving this that were outlined in the introduction?

DQI does provide an understanding of client needs among project stakeholders and allows for their prioritisation with respect to which aspects are required, desired or inspired. The representation of requirements in the Briefing record and other outputs (Figure 1) focuses entirely of client needs (albeit in the structure of the DQI questionnaire) and does not include contextual information. However, it is the Facilitator’s report that puts all these into a context that is meaningful for use by different stakeholders. This situation is therefore similar to the current practice of presenting briefing information in various documents, except that a DQI facilitator’s report will not contain all relevant contextual information as a briefing document should (ISO, 1994). Furthermore, while the sections of the DQI questionnaire reflects different aspects of design quality, it is somehow different to how briefing information was presented and/or used by designers in the case study projects, and in the case of Project A, where DQI workshop outputs were being used to evaluate aspects of bids, the DQI assessment had to be mapped against the technical aspects of the design. This is not to say that the use of DQI was considered after both projects had commenced. The process is also mainly an aggregation of different stakeholders’ views, since the duration of each workshop (average of 5.5hrs for project A and 2.2hrs for project B) is insufficient to explore all aspects of the client’s needs. There is therefore a reliance on previous (and usually separate) consultations with various stakeholders for DQI to be a success. The description of client needs are also at a high (performance based) level, which does not go down to details such as types and numbers of spaces, room data sheets, which can be subject to many changes. Client organisational factors are dealt with in the background information to the DQI facilitator and in the selection of stakeholder representatives, but relies on the skill of the facilitator to ensure that these are reflected in workshop discussions and outputs. The involvement of design and construction representatives as part of the workshop though, has the benefit of communicating to designers the desires and priorities of other stakeholders they may not have interacted with before. Thus, while DQI facilitates a representation of aspirations and priorities of stakeholders and therefore allows focus on these wishes without other contextual information, the quality of this information may depend on the quality of the Facilitator’s report.

With respect to the documentation and tracking of requirements, the DQI tool provides a very robust mechanism for achieving this, through the briefing record score and target line developed at the briefing stage. In both projects A and B, this was successfully used in the assessments in other stages even after a relatively considerable period (4 years in Project A). Throughout the process, it was possible to compare design and building outcomes to aspirations set at the briefing stage. It however didn’t capture the change in those priorities, nor did it allow the checking of how changes affect design and project operations on a day-to-day basis. Although it should be possible to generate new briefing records during the course of the project, this was not done on projects A and B because of the direct cost of paying for the tool and facilitation services and the indirect cost of stakeholders’ time to participate in DQI workshops. This also limits the full use of the tool and in most of the DQI workshops the author has facilitated, only the Briefing and Mid-Design stages (Table 1) are completed. Furthermore, since the tool is provided by a third party, it is not clear how much control the client (as represented by the DQI Leader) has over the data generated (although in theory they do have access to it), since they may not have the skills to analyse it is as Facilitators do. The other limitation is that
the priorities set are very much dependent on the stakeholders represented at the time; an equitable representation of all relevant stakeholders is usually not possible due to availability, restrictions on numbers in any one workshop, etc. The assessment in DQI is also based on the subjective perceptions of stakeholders (with objective methods to aggregate individual scores), usually based on insufficient information due to the relative short duration of workshops.

As a facilitated service, the use of the DQI tool combines the behavioural aspects of requirements management with the robustness of an online software tool. The facilitation aspect allows for flexibility to suit the needs of the project and stakeholders concerned. For example, the evaluation of bids was not the original purpose of DQI, but it was possible to use it as such for Project A. The duration of each workshop was also curtailed for Project B to accommodate the relatively shorter attention spans of school pupils, and allow workshops to be conducted during school hours. On the other hand, the robustness of the online software enabled assessments to be compared to original aspirations even after 4 years (as for Project A). There is some measure of automation in that output graphs are generated automatically, but not in compliance checking as in the tools being developed by Ozkaya and Akin (2007) and Kim et al. (2015). The online software is also not integrated with any design or project application.

Towards a Requirements Oriented Project Process (ROPP)

The discussions above show a continuity of focus on the original client/stakeholder aspirations, but not every aspect of the conditions for maintaining focus on clients were addressed. However the DQI tool, which can also be considered as a process given its alignment with the RIBA Plan of Work (Table 1), can be transformed into a Requirements-Oriented Project Process (ROPP) using insights from Requirements Management (Ozkaya and Akin, 2006; Kamara, 2008). A key to this will be the integration of the DQI tool within a digital project environment such as BIM or making it interoperable with other project data and applications. This will facilitate interactivity and compliance checking between defined aspirations and project decisions and actions (Alhava et al. 2014, Kim et al. 2015). A framework for achieving this could include the following elements:

- **A Client Requirements Specification (CRS)** or standard data structure for representing client requirements in a computer readable format such as Industry Foundation Classes (IFCs) (after the work by Kiviniemi (2005)). The standard structure of the DQI questionnaire could inform this process, but other project data and applications will also need to be structured to interact with client requirements data.

- **A Client Requirements Application (CRA)** that is developed from the CRS, and interoperable with other project applications and environments that are based on the same data format (e.g. IFCs). The CRA will be a separate but integrated module within a digital project environment (e.g. BIM).

- **A Client Requirements Document (CRD)** that is generated by the CRA. The CRD is similar to the DQI briefing record, except that it should be a dynamic file containing the evolving client requirements plus other contextual information over the course of the project. This should be generated much earlier in the project process (unlike the use of DQI in Projects A and B).

The interactions of these elements in the proposed ROPP framework is presented in Figure 3. The CRA is the core engine for the ROPP that combines client requirements and contextual information to inform the design/project process, interacts with other project applications and data to track and check compliance with client requirements, and generates and updates the CRD (creating different versions) over the course of the project. A facilitated process (as in current DQI) will be used to define and priorities clients’ aspirations. This, and other contextual information will be inputted into the CRA, which will then automatically generate the first version of the CRD. The CRA automatically checks compliance to client requirements at specific stages in the project by interrogating other project documents and applications within the digital project environment. Automatic checks for compliance can be supplemented by human agency (as in DQI assessment workshops) but the CRA will have the
facility to record changes and update the CRD (into a subsequent version); compliance checks can also lead to changes in project actions (e.g. change in design or specification).

Figure 3: Framework for Requirements-Oriented Project Process

To facilitate compliance checking, both client requirements information and other project data and applications need to be represented in a format that can allow automatic checking. This could be achieved as follows:

1. The client requirements specification should be based on a performance based definition of client requirements that is solution neutral. E.g. “floor area”, which can express a need for adequate space, is solution neutral as different floor configurations can achieve the same space requirement.
2. Develop design or building performance metrics (BPM) that will translate high level client requirements into operational design or project actions. A design or BPM comprise three interrelated parts: a statement of what is to be measured (e.g. floor area); a unit of measurement (not necessarily in quantitative terms); and a target value (i.e. a range that constitutes the design solution space) (Kamara, 2008). There are already performance metrics in use, such as time, cost targets, air flow rates, etc. These are mostly quantitative, but there are many qualitative and subjective factors (e.g. need for security, comfort, etc.) that are not formally expressed. A core set of metrics can be developed with scope for users to add other metrics.
3. The building performance metrics can serve as the parameters (as in parametric modelling) that will influence the creation of links between different sources of briefing information (in the CRD), and for compliance checking between the CRD and other project data and activities, as in related research by Ozkaya and Akin, 2006; and Kim et al. 2015.

Focus on client requirements over the course of the project is maintained via the dynamic and evolving Clients Requirements Document (CRD).

CONCLUSIONS

In this paper, the broad question of how focus on client requirements can be maintained over the course of a project, has been considered. This was against the framework of the general management of projects which necessitate the consideration of other stakeholders and criteria for project success. The specific focus on the paper was to explore whether the Design Quality Indicator (DQI) tool does contribute to maintaining focus on client requirements over the lifecycle of a project. From the two case studies considered, it can be concluded that the DQI tool:
1. Enhanced the understanding and prioritisation of client requirements among project stakeholders, but did not consider contextual factors that affect their implementation.

2. Allowed requirements (or rather a prioritisations of aspirations) to be presented in textual and graphical form following the structure of the DQI questionnaire. Whilst this can assist in informing designers of stakeholders’ priorities and in assessing how they are achieved over the project, the format is usually not compatible with how requirements are represented in the wider project, necessitating a mapping exercise.

3. Was very useful in assessing and comparing designs and the completed building against original and/or previous stakeholder aspirations and priorities. However, it did not allow the checking of how changes affect design and project decisions and activities.

4. Combined flexibility and soft facilitation skills with the robustness of an online software tool in the process of defining and assessing client/stakeholder aspirations. However, the third party provision of this tool can limit its full exploitation by clients.

In essence, the DQI tool does maintain focus on client requirements, but it is limited in the kind of focus it provides. The proposed Requirements-Oriented Project Process (ROPP) framework, which draws inspiration from the DQI, offers possibilities for addressing its shortcomings in maintaining focus on client requirements. The dynamic and evolving Client Requirements Document (CRD), which is generated and updated by the Client Requirements Application (CRA) using the structured format of the Client Requirements Specification (CRS) will ensure that the integrity of the client’s requirements are maintained throughout the project, but in a form that relates to relevant contextual information for their implementation. Combining automation with human input in defining and prioritising requirements on the other hand, will address a key requirement for ensuring the success of Requirements Management applications in architectural/construction projects. Further research and development is obviously required to make this into a reality, for example in developing the CRS, CRA, structures and protocols for automated compliance checking, etc. But research by Ozkaya and Akin (2006, 2007) and Kim et al. (2015) are good indications of the possibilities in this area.

REFERENCES


Table 1: DQI Stages mapped against the RIBA Plan of Work Stages [adapted from DQI (2014) p. 11]

<table>
<thead>
<tr>
<th>RIBA Stage</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>DQI Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td>Define aspirations and priorities. Develop a language for communicating with stakeholders and a common understanding of what constitutes success.</td>
<td>Communicate design decisions, and review design against priorities set out at briefing stage. Design team gains valuable feedback on their designs.</td>
<td>Re-assess design to ensure that any outstanding issues have been resolved. Give assurance that it will deliver a project that satisfies the needs of stakeholders.</td>
<td>Assess completed design against aspirations. Gain understanding of how the delivered project fulfils expectations, and of what people think of the building when it is new.</td>
<td>Review and record successes and limitations of project. Capture and communicate to the client, the impact of the building on users and the local community.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Questions</td>
<td>What kind of building do we need, to achieve our vision for this project?</td>
<td>How well does the design meet the needs and expectations set out at briefing?</td>
<td>How well does the design meet the needs and expectations set out at briefing?</td>
<td>How well does the completed design concept fulfil our expectations set at earlier stages</td>
<td>Does the building do what we want as well as we want?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2: Details of DQI Use in Projects A and B

<table>
<thead>
<tr>
<th>DQI Stage</th>
<th>Project A</th>
<th>Project B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briefing Workshop</td>
<td>March 2007. Duration: 5hrs, 24 participants (representatives from the three FRAs and other stakeholders; representatives from three bidders were observers and received workshop report). A briefing profile (line graphs in Figure 2) was developed and key aspirations with respect to future proofing of spaces, the need for the building to contribute to the efficiency and effectiveness of the organisation, good access and for natural lighting for the project were established.</td>
<td>November 2009. Duration: 2.5hrs, 15 participants (school pupils, teachers, parent governors, client, and project team). Briefing profile, Target Line in Figure 2f, developed. The key measures for success: (a) a design response that significantly went beyond minimum standards in all areas; (b) internal spaces that are bright, have enough light, and which feel spacious; and (c) innovative, well-designed, multi-use external spaces that provide facilities for study, performance, relaxation and recreation.</td>
</tr>
<tr>
<td>Mid Design Workshop</td>
<td>June 2007. Duration: 5.5hrs, 24 participants (most were present in Briefing workshop). The briefing record was used to assess the designs of the three bidders (A, B, and C). Each bidder made a 20-minute presentation. A1 display boards and further details on each design were also made available for participants to consider afterwards. Figure 2(a-c) show the ratings of the different designs from bidders.</td>
<td>July 2010. Duration: 2hrs – 27 participants (comprising 18 school pupils plus school governors, staff, and client). Assessment of presented design is shown in Figure 2(g). Positive features included: the size and links between classrooms, size, layout and navigation of spaces, play areas, and the modern feel to the shape of the building. Concerns raised about maintenance and cleaning of windows, facilities in classrooms, proposed shared use of the dining hall with wider community, and the size of the car park.</td>
</tr>
<tr>
<td>In-Use/ Ready for Occupation</td>
<td>January 2011. Duration: 6hrs, 20 participants (but very few had attended previous workshops). To enable discussions of the assessment scores, various stakeholders were requested to complete the online In-use assessment for their respective buildings before the workshop. A total of 72 people (63 users and 9 non-users) for the different buildings completed the assessment scores. Figure 2d shows the overall aggregated ranking for the project, compared with the briefing record developed in 2007. The separate scores for each building within the project are shown in Figure 2e.</td>
<td>July 2012. Duration: 2hrs, 23 Participants (similar representation as before). Positive assessment of the new building (Figure 2h) but the scores were not as high as the design (Figure 2g). Positive features included: the light and airy feel within the school, the welcoming atmosphere of the main entrance and reception areas, the layout and space in classrooms, the flexibility of classroom spaces, the link between outdoor spaces and classrooms and the overall innovative feel of the design. However dissatisfaction was expressed about the size of the dining room and the number of toilets.</td>
</tr>
</tbody>
</table>