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Area of interest: Design Quality Management, Sustainability, Energy Efficient Design, Architectural Heritage, Disaster Management, Tourism.

Design Quality Indicators: A Mechanism for stakeholders' participation in maintaining Architectural design quality

Abstract:

The quality of architectural design has always been a matter of subjectivity. The quality of any construction project is rarely assessed in an objective manner. The Design Quality Indicators, a tool developed by the Construction Industry Council of the United Kingdom in 2002, presented a framework for measuring quality of design. The tool collects feedback from stakeholders at various phases using a web-based questionnaire. Construction of building involves client's money and there is a rise in awareness for the value of the project. In this conceptual paper, the author has done a systematic literature review to establish the changing role of the stakeholders in construction projects for last couple of decades to argue that there is a requirement of a framework to measure the design quality of the building in Indian context which captures the desire and aspiration of the users and other stakeholders to produce a delightful experience.

Keywords:

Architectural Design Quality, Stakeholders' Participation, Collaborative design, Design thinking, Architectural Design Process

1. Introduction:

Since the beginning of the twentieth century, the construction industry in the UK has undergone a paradigm change regarding the inclusion of project stakeholders in the project life cycle. This trend first began in the manufacturing sector and spread to the construction industry. Following the publication of "Rethinking Construction" (Egan, 1998), the collaborative design practice in construction industry started getting prominence. The task team established by then Deputy Prime Minister of UK, John Prescott set out to improve the Constuction industry which was experiencing "less profitability", "client dissatisfaction",





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“fragmentation”. The focus was on the ‘customers’, ‘integration of the process around the product’, ‘a quality driven agenda’, and commitment to the people. Architectural design is as technical issue as it is a social issue. The architectural design process is a combination of inventiveness and creativity from the arts and sciences that could create architecture that can change the globe to suit specific human needs (Gilbert,1966). The design of the built environment is required to be agreeable with clients’ aspiration about the project. Therefore, a communication system must be built between the designer of the buildings and the clients and the users (Mayam Shabak, Norouzi, Abdullah, & Khan, 2014).

2. The value of architectural project

One of the three restrictions in each project is quality., other two are namely time and cost (figure1). While there are measuring tools for both time and cost, quality remains unmeasured in objective manner and remains as individual’s perception. Quality as defined by Cambridge Dictionary is “of a high standard” or “the degree of excellence of something, often a high degree of it”. As per The Oxford dictionary quality is “The standard of something as measured against other things of a similar kind”. The quality of design can be defined as the value of design to its users

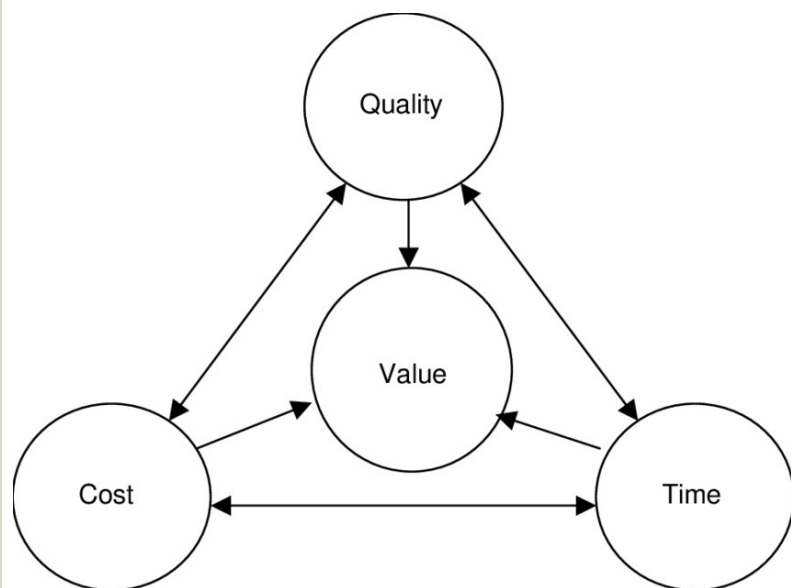


Figure 1: Value of product as function of quality

Source: Author





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Design quality could be function of any combinations of usability, performance, aesthetics, reliability, predictability, stability, consistency, safety, and security. Measuring design quality is still in a very elementary stage in emerging nation like India, though it has great impact on the satisfaction of the end users. Building is a product of design, and the quality of building depends on the quality of architectural design. ISO 9000 on Total Customer happiness is one of the goals of the organization that uses quality management. In case of the buildings the end users are the primary customers of the product. The value of the building can be determined by the satisfaction and dissatisfaction experienced by the end users of the building. Thriving for better quality in design improves the competence of the functioning of the building and in turn users' satisfaction.

2.1. ISO 9001: Total Quality Management

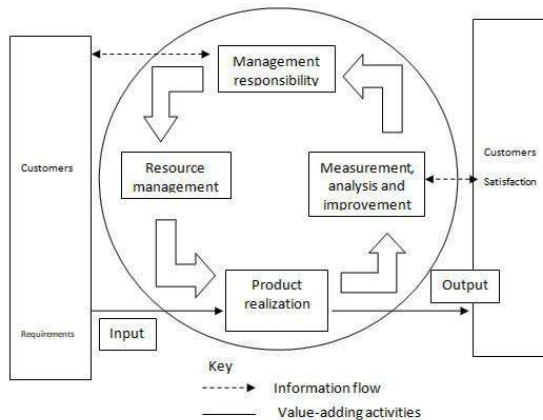
This International Standard promotes the application of a process-based approach for developing, implementing, and upgrading the effectiveness of a quality management system to raise client satisfaction by satisfying client demands. Total quality management (TQM) is a management theory whose goal is to increase a company's capacity to provide quality to its clients on a foundation of continuous improvement. When used within a quality management system, such an approach emphasizes the importance of

- a) Understanding and meeting requirements,
- b) The need to consider processes in terms of added value,
- c) Obtaining results of process performance and effectiveness,
- d) Constant progress of processes based on objective measurement

Through the efficient use of the system, which includes procedures for ongoing system improvement and the guarantee of adherence to customer and relevant regulatory requirements, it seeks to increase customer satisfaction. (figure 2).



Figure 2: Total Quality Management Process Flow



Source: ISO 9001: Total Quality Management

ISO 9001: Total Quality management emphasizes on the customer requirements are to be captured in every stage of the building. As building is a product of design process, it is significant that the end-users are included in the design method as well.

3. Stakeholders’ participation and complexity in communication process

The clients’ aspiration for buildings is a direct reflection of client’s background, social needs, moral values. This is also controlled by the Governments’ policy, religious activities, advancement of technology and material sciences, procurement strategies, etc. Previously, buildings used to be designed in more repetitive, consistent, and intuitive manner (RIBA, 2020). With the altering disposition of clients’ team, design team, and project team the design of projects is now more complex issue and required to be dealt with more sensitivity. In traditional architectural practice, the involvement of clients is more in briefing stage, and it hardly considers the end users ‘involvement till the handover is done. A well written brief on which the design is

based is the key tool for the client to correspond with the designers. RIBA suggests appointing a client’s advisor for briefing stage. Throughout the project’s life cycle, there are numerous stakeholders whose connections with the project may or may not be contractual. Managing and responding numerous types of opinion coming from various stakeholders at different stages could be complex in nature. A systematic involvement of various project stakeholders can minimize the complexity. This collaborative design process can bridge the gap between the users’ aspiration and the designer’s imagination (Coughlan & Macredie, 2002). Study have established that inadequate stakeholders’ management is one of many causes of project failure (McManus, 2008). Conflicts between users, large numbers of users, lack of users’ participation, non-willing users, unrealistic expectations are some of the causes (Taherdoost, Keshavarzsaleh, 2015) that lead to project failure. All the above-mentioned problems can be handled at different stages of project with the proper stakeholders’ involvement and management plan. The ‘Design Quality Indicators’ (DQI) of the United Kingdom is a pathbreaking initiative in the domain of architecture.

4. The inception of the “Design Quality Indicators” tool in the United Kingdom

4.1. Background of DQI

“The Construction Industry Council” of United Kingdom started creating the “Design Quality Indicators” in 1999 and was launched as online resource in 2003. DQI was used as part of the design development to engage end users in a structured conversation around their



specialist requirements for the building at the briefing stage, and to test whether these aspirations had been met during the design development. The evaluation ensured that the supply and demand sides shared a similar vision for the new structure and that the design and consumers were standing in a straight line. (dqi.org).

4.2. Research phase:

Table 1: Structure of the Design Quality Indicators, including section and subsection level titles.

‘Functionality’	‘Build Quality’	‘Impact’
Use	Performance	Form And Material
Access	Engineering Systems	Internal Environment
Space	Construction	Urban And Social Integration
		Character and Innovation

Source: Author

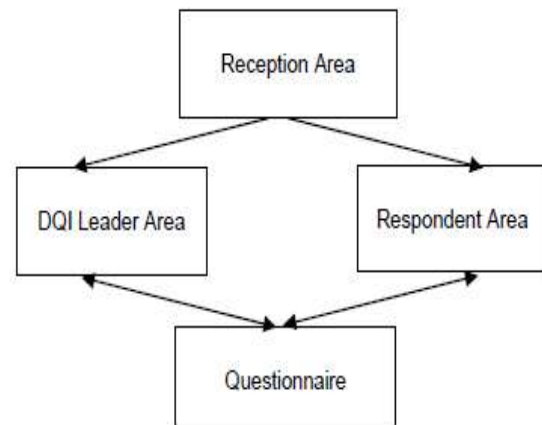
This phase, which was supported by the Department of Trade and Industry of the United Kingdom, saw significant development of the conceptual framework, data-gathering tool, and weighting mechanism. The tool was also trialled on five design and construction projects

4.3. Innovative plan and creation of a web-based tool

In 2002, a manual tool was launched at the Design Council. That tool was steered on 600 projects across 100 architectural firms. The qualitative data received from the feedback of the piloting and beta testing were used to create the web-based tool.

The structure of the review process in which the DQI is employed would be significantly impacted by the design of the interactive web-based application. Several strategic choices regarding this application infrastructure were taken after the meeting. The current prototype places the facilitator in charge and allows them control over how to set up the procedure and communicate the outcomes to the participants. It is made up of the questionnaire, the DQI Leader area, the Respondent area, and the reception section.

Figure 3: Organization of the interactive net-based tool



Source: (J.K. Whyte, 2003)

4.4. Process and stages in DQI assessment

The DQI process consists of five steps, including briefing, concept, mid-design, ready for occupation and in-use, which, respectively, which can be easily mapped to Stages of building construction projects, for example: 0/1, Stages 2/3, Stage 4, Stages 5/6, and Stage 7 of the Royal Institute of British Architects’ (RIBA, 2013) Plan of Work or the seven stages of construction projects as described by Council of Architecture, India, namely Concept Design (Stage1), Preliminary



Design and Drawings (Stage 2), Drawings for Client's/ Statutory Approvals (Stage 3), Working Drawings and Tender Documents (Stage 4), Appointment Of Contractors (Stage 5): Construction (Stage 6) Completion (Stage 7). The DQI stages may also be used to map the phases of a building construction project according to the American Institute of Architects (AIA). “Schematic Design Phase”, “Design Development Phase”, “Construction Documents Phase”, Bid, and Construction Administration are those phases.

Figure 4: Level of clients’ involvement in DQI stages

	0	1	2	3	4	5	6	7	
Stages of the RIBA Plan of Work 2020	Strategic definition	Preparation and brief	Concept Design	Developed Design		Technical Design	Construction	Handover and close out	In-use
Council of Architecture, India	concept design			preliminary design and drawings	drawings for client's/ statutory approvals	working drawings and tender documents	appointment of contractors	construction completion	
The American Institute of Architects (AIA)	schematic design phase			design development phase	construction documents phase	bid phase	construction administration		
DQI Stages	Briefing		Concept	Mid design			Ready for Occupation	In use	
Involvement of Clients and end users	Clients' vision and users' inspiration	If the preliminary design is meeting the requirements of the briefing stage		If the design is meeting the expectation set out in briefing stage			Ready for Occupation How does the completed design fulfill the need of the users	Does the building perform as per the expectation of the clients and users?	

Source: Author

5. Discussion

The Participatory Design in architecture is a comparatively new field. This has emerged only in last 30 years (Sanders, 2010). However, with the aid of many visualizations software the users’ participation have become easy from the initiation of the project. The Design

Quality Indicators tool have been effectively used on 1400 projects from its inception. While in briefing stage it has been used to capture the users’ aspirations, in mid design stage it has been used to benchmark the design as per the aspirations (dqi.org.uk) creating more values. For many projects the Design



Quality Indicators tool has proved to become a catalyst for the higher rating for other building environment assessment tools like BREEAM and helped in decrease the expenditure.

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7. Reference

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