

# Service quality factors in the construction sector: A literature review

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**Abstract.** This paper consists of an exploratory literature review whose main research objectives were the identification of the service quality factors that are considered more important in the construction sector, the service quality models that are used to measure quality, and how are they related to success factors. The research methodology is documental and based on a review of articles obtained from six major scientific databases. The description of the main results follows. In all cases, the traditional models of service quality were used as guidelines to explain and adapt to specific contexts. The typical parameters used in these models are reliability, responsiveness, communication, credibility, assurance, empathy with the client and construction quality. In some cases, additional dimensions were added. Success factors seem to be intrinsically related to project management, communication skills, professional skills, quality of the final product, design, aesthetic and innovation, where the three latter ones represent parameters that have gained recently preponderance. A holistic, flexible and adaptable attitude seems to be relevant to face dynamic and turbulent conditions and changing customer's requirements and expectations. Overall, the results indicate a generalised conservative approach which characterises this sector.

## 1. Introduction

The Construction Sector (CS) is a complex sector and satisfying customers' expectations represents a challenge for organizations within this sector. Service Quality (SQ) is related to the satisfaction of clients. Identifying Success Factors (SF) of SQ represents an important approach that aims to improve the quality of the organizations within the CS.

The International Standard Industrial Classification and the Central Product Classification [1], consider that the CS has two parts: first, construction that covers the physical outputs of construction activities (e.g., buildings or civil engineering works); and second, construction services that cover services provided in constructing these objects [1]. Construction is also a process of delivering physical outputs to the client through a temporary production system that consist of elements shared with other projects [2]. Therefore, the CS can offer goods and services at the same time [3]. Both dimensions are generally present in all construction projects and are dynamically and non-linearly related, which justifies why the CS can be considered and treated as a complex system [4].

The aim of SQ in an organization is "to evaluate the satisfaction of consumers through the analysis of the gap between the expectations and the perceptions of the consumers in a specific time after receiving a service" [5, 6]. SQ is dependent on technical quality and functional quality but corporate



image plays an important role [7]. Dimensions have been defined to measure SQ, such as reliability, responsiveness, assurance, empathy, and tangibles [8, 9]. Each SQ dimension has several attributes and factors that may influence with different levels of intensity customer satisfaction. Some of these attributes and factors can be considered as SF. The identification of SF in construction services and their relationships, represents the basis for developing a process approach in construction organizations [10].

The goal of this document is to present a comprehensive literature review related to the evolution of SQ factors within the CS. Identifying the SQ factors that are considered more important in the CS, the SQ models that are used to measure quality, and how are they related to SF. The remaining paper is organized as follows:

- The research methodology is addressed in the following section (Section 2).
- A presentation of the main concepts in the beginning of Section 3 was developed to explain SQ and SF (Subsection 3.1).
- An identification of traditional and new factors presented in the literature was developed through an analysis of the research of important authors (Section 3.2) with an explanation of dimensions for future study (Figure 1).
- The paper ends with a discussion and conclusion section.

## 2. Research methodology

This work is an exploratory study and the literature review was made by analysing documents from high quality journals, conferences and institutes, addressing several topics of the CS, with a focus on the concept of SQ. The search was executed using six general scientific databases: Scopus ([www.scopus.com](http://www.scopus.com)), Web-of-Science ([www.webofknowledge.com](http://www.webofknowledge.com)), IEEE Xplore Digital Library ([ieeexplore.ieee.org](http://ieeexplore.ieee.org)), Emerald insight ([www.emeraldinsight.com](http://www.emeraldinsight.com)), Science Direct ([www.sciencedirect.com](http://www.sciencedirect.com)), and Microsoft Academic ([academic.microsoft.com](http://academic.microsoft.com)). The list of keywords used in this search included combinations of the keywords “Service Quality” with “Construction Industry” and/or “Construction Sector”. The search results were analysed manually and systematically and reduced to 33 relevant documents related to this review aim, and 17 more as complements that provided valuable insights and new research directions.

## 3. Literature review

### 3.1. A short presentation of the main concepts

3.1.1. *Service Quality*. Service Quality (SQ) is related to the satisfaction of the clients in the short term, and it is related with the factors that change continuously. SQ has no singular definition. According to [5] to assess SQ in an organization is “to evaluate the satisfaction of consumers through the analysis of the gap between expectations and perceptions in a specific time after receiving a service”. SQ depends on technical quality and functional quality with an important role of the corporate image [7]. The technical quality interprets what are the expectations, the functional quality finds the way in which the organization interprets the characteristics and translates them to technical specifications of work, and the corporate image deals with the perceptions of the consumers about the organization of the service that depends on: technical and functional quality, price, external communications, physical location appearance of the site, and the competence and behaviour of firms’ employees and the associated service [11].

Some propositions are presented that provide different understandings of SQ, which is viewed from different angles: SQ “is the consequence not only of the performance of service, but also of the interaction between customer and firms” [12]; SQ “is an important determinant of customer satisfaction which in turn influences customers’ loyalty” [13]. Therefore, SQ within CS organizations contribute to develop a new way of understanding them.

*3.1.2. Success Factors.* Success Factors (SF) are mechanisms that allow organizations to survive, adapt and prosper in a competitive market. SF of SQ represents an important approach that aims to improve the quality of the organizations. Five dimensions or factors can be defined to measure SQ [8, 9]: (i) reliability, as the ability to perform the service in a careful and reliable manner, (ii) responsiveness, willingness to help clients and provide fast service, (iii) assurance, knowledge and attentions shown by employees and their abilities to generate credibility and confidence, (iv) empathy, personalized attention with kindness and courtesy, (v) tangibles elements, aspect of physical facilities, equipment, personnel and communication materials.

SQ processes developed with customers helps to create an organization culture oriented to generate customer satisfaction all the time. SF influence the decision making process, the improvement of plans and the formulation and implementation of strategy. Therefore, SF within the SQ process help to improve the organization competitiveness and the adaptation to the market.

### *3.2. Service Quality Factors in the Construction Sector: exploring the literature*

*3.2.1. Traditional Factors.* In general, SQ traditional models are widely used by firms as guidelines to explain and adapt to specific contexts. Thus, in this section, we explore the literature in terms of the use and the chronological evolution of traditional factors (the presentation of authors follows roughly a chronological perspective).

Segura [14] and Asahara [15], as all the authors identified in this section, identified in their studies the use of the traditional factors to measure SQ, in some form or another: reliability, responsiveness, competence–construction, access, courtesy, communication, credibility, confidentiality, understanding the customer, and tangibles. The literature identified these traditional factors in several studies of sub- sectors of the CS, or in studies of the construction process. For instance, Holm & Bröchner [16] studied SQ in housing refurbishment and craftsmen and suggest that "service delivery in conversion projects appears to be the key to improved reputation for the contractors, where contractors meeting the users' expectations and craftsmen behaviour are central elements" (p. 543); and "satisfaction with the service is dependent on the interaction between the service provider and the user" (p. 536). Segura [14] also proposed some propositions about SQ and customer satisfaction related to reputation, and to the capacity of the firm to provide value added to the customer by adding and mixing tangible and intangible dimensions, or product and service, to the overall product. Asahara [15] emphasized the phases in the construction process, such as planning and design, contact, and construction phases and some SF were identified. From the user perspective, SF included: project management and satisfaction; incidents; information; company background; and landlord information incident. From the service provider perspective, SF included: project management and satisfaction; details; and company reputation and experience. Holm [17] analysed SF into housing refurbishment in two ways: (i) Opinions from workers (such as satisfaction and communication, quality control and information, behaviour and quality of work; (ii) Opinions from tenants such as: landlord behaviour and dust exposure; quality, expectations, recommendation and trustworthiness; workers' behaviour; and interaction and voting for contractor. In all of these studies, research concluded that SQ constitutes an important aspect within CS and it is necessary to incorporate a continuous improvement process to generate customers' satisfaction.

Al-Momani [18] and Hoxley [19] identified SQ SF in the construction process and UK construction professional services, respectively. The attributes suggested by [18] were related to project management, contractual issues and reliability issues. Hoxley [22] also analysed SQ in the public sector by professionals' services in relation to the determinants that the UK government suggests. In all cases SQ SF oriented to the analysis of the professional's quality within CS proved to be very important.

Maloney [3] considers that the construction provides a service that consists of three elements: service product; service environment; and service delivery, where firms often have several roles. Organizations in the CS can be analysed as firms that provide products and services at the same time in a complex and interdependent way. For instance, Love et al. [20] analysed SF in architecture and engineering through the supply chain, arguing that the management of the supply chain is very important in terms of providing reliability. Siu, Bridge & Skitmore [21] introduced a SQ reflection

in building maintenance from the perspective of Mechanical and Engineering Services (M&Es), which includes electrical firms, plumbing firms or air-conditioning firms, and identified important discrepancies in expectations and perceptions between service users and service providers. Concerning the interactions inside the supply chain, Segura [14] proposed SF that were grouped in the following categories: contractor-customer relationship, the contractor's project management skills, the contractor's safety performance, prepared/skilled workforce, cost and general satisfaction. The overall conclusion of these studies was that a permanent feedback process seems to be necessary to improve SQ and organizations need a flexible and adaptable structure to respond to frequent changes in requirements and expectations and to manage the effective provision of these demands through their networks of contractors or partners.

Arditi & Lee [23] and Ling & Chong [24] argued that customers have high expectations of SQ from D&B contractors but Cheng, Proverbs, & Oduoza [26] argued that those expectations are frequently not met and that, although there are many causes underlying that discrepancy, the main ones are attributable to project management deficiencies and inferior quality. Ling, Ibbs, & Hoo [25], Kärnä, Sorvala, & Junnonen [27] and Kärnä, Junnonen, & Sorvala [28] corroborate this by identifying project management but also communication skills as key SF that contribute to the successful performance of projects by national or international construction firms. Ismail, Othman, & Amat [29], Hui & Zheng [30], Sunindijo, Hadikusumo, & Phangchunun [31] and Durdyev et al. [32], identified the dimensions of "empathy", "assurance" and "reliability" as the most significant ones in terms of its effects on customer satisfaction and on the success of CS projects and firms.

The studies referred above seem to suggest that, besides the factors related to professional skills and tangible aspects of construction quality, as pointed earlier in this section, SQ requires a continuous communication process to assess the effectivity of the actions. A holistic vision seems necessary to understand the design and later the service process to develop SQ SF. SQ needs an understanding of the environment changes alongside the improvement of the communication process. The studies also suggest that in many instances firms adopt a rather conservative approach to these issues.

As a way of synthesis, Table 1 shows a summary of the most important aspects identified by representative authors, as explained above, classified by SQ Dimension, emphasizing the use of traditional models.

**Table 1.** Success factors by SQ Dimension - traditional

<b>SQ Dimension</b>	<b>Most important SF</b>	<b>Selected representative authors</b>
<b>Reliability</b>	Total quality of work output. Reputation and experience Delivery times	[4], [15–22]
<b>Responsiveness</b>	Professionals skills Workers behaviour Technological tools Incidents resolution Work disruptions	[14], [20–24], [26], [28], [29], [31], [34], [39], [41], [44], [45]
<b>Assurance</b>	Competence Credibility Confidentiality	[3], [20], [23], [26], [28], [40], [41], [43]
<b>Empathy</b>	Access Courtesy Communication Understanding the customer Interaction with customers	[3], [23], [26], [28], [33], [39–41]
<b>Tangibles</b>	Technological tools	[3], [26], [33], [39]–[41]

3.2.2. *New Factors.* In this section we explore some of the new SQ SF that are proposed in the literature, which are different from the traditional ones that were explored in the last section, and which reflect additional perceptions of other stakeholders.

Forsythe [33] developed a model to understand the SQ in the sector of Housing Construction (HC). He adapted the gap model to suit the design and construction process by merging it with SQ in construction projects and he incorporated some new factors such as: aesthetic (construction) workmanship, technical (construction) workmanship, and design detailing by workers onsite. Thus, a different vision to understand SQ is incorporated by this author, which differs from more traditional perspectives [34].

Bjeković & Kubicki [35] argued that it is necessary a deep understanding of business activities to generate service innovation processes. They argued that SQ is the “umbrella concept abstracting some non-functional aspects of service” (p.514) suggesting a direct connection between service innovation and SQ. In addition, they identified quality categories and factors that affect SQ such as: (i) business stability: business domain adequacy, effect on collaborative practices, reputation within the sector; (ii) stability: reliability, availability, accuracy; (iii) performance: time behaviour, resource utilization; (iv) security: confidentiality, integrity, non-repudiation, accountability, authenticity; (v) usability: understandability, learnability, ease of use, user error protection; and (vi) regulatory and interoperability: supported standards, interoperability. These identified SF are related to knowledge and other intangibles dimensions not previously considered in traditional models. Similarly, McClements, Odeyinka, & Eadie [36] developed a construction consultant pre-selection factor model in relation with the intangible attributes related to trust.

Forsythe [37] investigated SQ as an input to pre-purchase (pre-contract) expectations in the made-to-order HC, and discovered that “customers tend to be highly involved in the design process and also observe the construction as a live act with a vested interest in the speed, cost and quality of construction” (p.590) arguing that the needs recognition, in relation to design, but also to other aspects, is important in managing customers’ satisfaction [38]. Tan et al. [39] identified SF within the building maintenance business in Hong Kong. SF identified were maintenance service, organization and project management, certification, people, relationship, marketing, but also, and similarly to above mentioned authors, innovation and sustainability.

Forsythe [40] developed a SQ model called BUILDSEV that is a combination of the traditional dimensions and new variables in a specific context in Australia. SF defined were reliability, responsiveness and communications, empathy, assurance, tangibles, care in execution of work, and work output. Also, an important contribution was the features oriented to generate positive or negative incidents during the construction process. They were (i) situational context, (ii) service provider involvement, (iii) sources of exposure, (iv) core content, and (v) customer awareness of involvement. These features emphasise the need to consider dynamic characteristics of the environment and their influence in the SQ process.

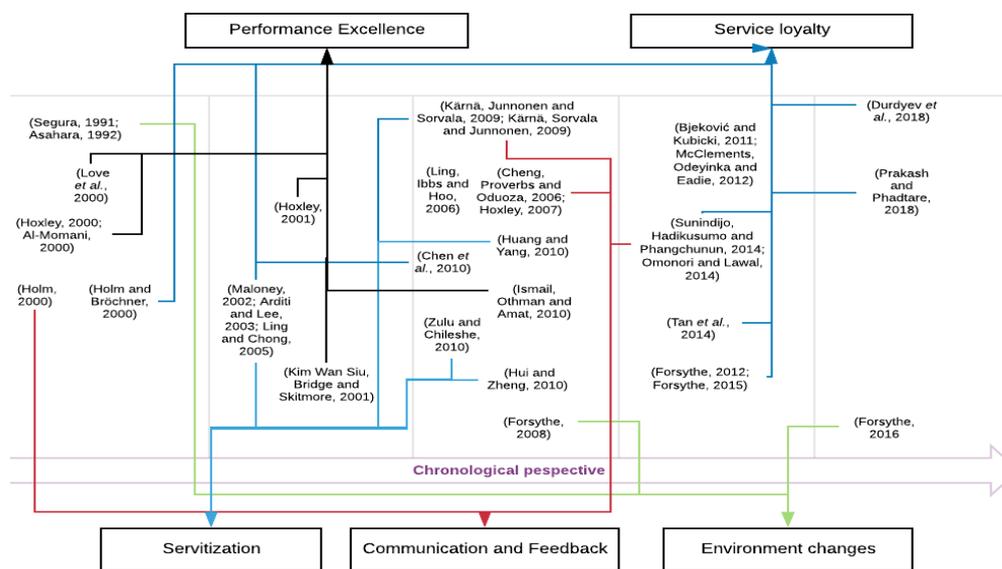
Forsythe [41] argued that “SQ is likely to be important to customer satisfaction during changing dynamics, unexpected events and different personal relations that occur during construction activities onsite” (p. 323) stressing the importance of dynamic factors to SQ. In this vein, Prakash & Phadtare [42] developed a scale to measure SQ having in mind that “uncertainty and turbulence in a business environment may bring progressive sophistication in design and construction” (p.670), requiring extensive amounts of information exchange. They identified the SF that affect SQ such as design quality, project administration quality, communication quality, relationship quality and dependability quality.

As a way of synthesis, Table 2 shows a summary of the most important aspects and representative authors by SQ Dimension, emphasising the surge of new factors that influence SQ.

**Table 2.** Success factors by SQ Dimension - new

SQ Dimension	Most important SF	Selected representative authors
<b>Quality Aesthetic</b>	Aesthetic (construction) workmanship	[28], [33], [39]–[41], [44]
<b>Design</b>	Technical (construction) workmanship Flexibility Adaptability	[20], [23], [25], [42], [43], [46]
<b>Care in execution of work</b>	Social responsibility	[40], [41]
<b>Innovation</b>	Sustainability Social responsibility	[39], [42]

Complementing the synthesis and the presentation of the main identified SQ dimensions and the respective indication of a set of the most important factors, Figure 1 presents a map of the literature that was reviewed, integrating two perspectives: a chronological one and a conceptual one in relation to the study dimensions proposed. Traditional and new SF can signal new trends and challenges for firms related to (i) *performance*; by offering increasingly better value to stakeholders through organizational sustainability and learning, and the dynamic capabilities of employees; (ii) *service loyalty*; striving to maintain permanent customer satisfaction and their perception of reliability; (iii) *servitization* as a process by which manufacturers move from a product-oriented business model to a service-oriented business model; (iv) *communication and feedback*; to reduce uncertainty and ambiguity within the construction process and (v) *environment changes*; dynamic and turbulent environment are complex, and it is necessary a flexible and adaptable business model in firms within the CS [47], [48].

**Figure 1.** Literature map

#### 4. Discussion and conclusions

CS is a complex sector and satisfying customers' expectations represents a great challenge. Understanding SF of SQ from the customers' perspective represents an important approach and for a construction organization is important to know, in the best possible way, the customers' expectations [30]. Important implications are implicit in this analysis, including the improvement of quality,

adaptability, flexibility and organizational learning oriented to customer satisfaction, customer loyalty [32] and to achieve a good reputation. SQ within CS organizations contributes to develop a new way of understanding them [49], and SF within SQ processes helps to improve the organization competitiveness and the adaptation to the market. It is in the interest of CS organizations to develop a SQ culture within their value chain to generate customer's satisfaction in the medium and long term.

Additionally, in the literature some propositions were presented about SQ such as (i) SQ constitutes an important aspect within CS and it is necessary to incorporate a continuous improvement process to generate customers satisfaction; (ii) SQ is dependent on the supply chain management; (iii) SQ represents a factor of competitive advantage and generates customer's loyalty; (iv) SQ helps to understand quality requirements. Therefore, SQ represents an improvement mechanism that needs a permanent feedback process and/or a continuous communication process to assess the effectiveness of the actions.

In this work, the results showed that traditional dimensions of SQ are still pervasive, with customers considering "reliability as the most important determinant in project SQ" [24] and the other dimensions, such as responsiveness, empathy, assurance and tangibles, can be regarded as important complements to generate customer's satisfaction in different contexts and circumstances. The new factors that were identified, such as quality aesthetic, design, care in execution of work and innovation represent an important trend that needs deeper study. In addition, traditional and new factors can contribute to study dimensions such as: performance excellence, service loyalty, environment changes, communication and feedback and servitization (Figure 1). They can be considered for future studies.

An organization within CS also needs a flexible and adaptable structure to respond to the great challenge of "customer's satisfaction" especially in more dynamic and turbulent environments. Thus, the understanding of drivers of customer satisfaction, which may be related to new factors, is the key element of SQ [24] and SQ culture developed in organizations could help to adapt their structure and processes to respond to the environment [50]. It is important to consider customer satisfaction to increase the market of customers and the future behavioural intention [24] and the features of the dynamic environment and their influence in the SQ process [24]. Therefore, a holistic, flexible and adaptable attitude seems to be relevant to face understand and face those conditions and changing customer's requirements and expectations.

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