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Theory of Quality: Meta-Synthesis and Theory Construction

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Abstract

This paper attempts a theory construction on quality and quality management via meta-synthesis. Meta-synthesis research method is the qualitative counter part of meta-analysis. It synthesizes past qualitative components of other research studies to form a theory. This theory explicates and amalgamates the various quality perspectives and relates the quality construct to the overall theme of value creation. This paper contributes to the quality literature forming a basis of reference and development of quality management.

Keywords

Quality, Quality Management, Quality Measure, Quality Theory, Theory Construction

1. Introduction

Quality management (Anderson et al., 1995; Anderson, Rungtusanatham, & Schroeder, 1994; Charmaz & Thornberg, 2021; Juran, 1999; Juran & Godfrey, 1999; Walton, 1988) has been in the academia and industry for decades. The research problem stems from an obvious lack of a theory to explicate the antecedents and consequences of quality and quality management. Moreover, there is a discrepancy in the definitions as well as the measures of quality, and the effectiveness of quality management beyond manufacturing concerns. There are also studies of quality of services, quality applied to work and work environment, and quality of life etc. Therefore, the research objective is to consolidate the various perspectives into an overall understanding of what is quality and how one could manage it.

2. Literature Review and Meta-Review

For descriptions of literature reviews, see Table 1 below.

Table 1. Summary of literature reviews.

Silvestro (1998) Key concepts: Error prevention, quality conformance	In the manufacturing literature, the definition of quality in terms of meeting the requirements of external customers was a major and radical departure from the traditional engineering definition of quality in terms of adherence to specification. Elimination of waste. The concepts of error prevention and visibility, zero defects and right first time…
Seth, Deshmukh and Vrat (2005) Key concept: Expectation and performance discrepancy	Technical quality (process), functional quality (outcome), image (Grönroos, 1984) Service quality is a function of the differences between expectation and performance along the quality dimensions Gap 1: Difference between consumers' expectation and management's perceptions of those expectations, i.e. not knowing what consumers expect. Gap 2: Difference between management's perceptions of consumer's expectations and service quality specifications, i.e. improper service-quality standards. Gap 3: Difference between service quality specifications and service actually delivered i.e. the service performance gap. Gap 4: Difference between service delivery and the communications to consumers about service delivery, i.e. whether promises match delivery? (Parasuraman, Zeithaml, & Berry, 1985).
Vieira, Winklhofer and Ennew (2008) Key concept: Relationship quality	Relationship quality (RQ) is replacing service quality and/or customer satisfaction as a key source of superior performance and competitive advantage in seller/buyer relationship. Trust, satisfaction, and commitment are the three key dimensions of RQ, while mutual goals, communication, domain expertise, and relational value are also core determinants. RQ as the degree to which buyers are satisfied over time with the overall partnership as manifested in product quality, service quality, and value for money (Huntley, 2006).
Shahangian and Snyder (2009) Key concept: Quality of care	Quality of care as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." (Institute of Medicine)
Ladhari (2010) Key concepts: Convenience, efficiency, safety, confidentiality	Four attributes with a website: i) ease of use (response speed, navigation support, use of new web technologies); ii) information content (quantity, quality, accuracy, customized information); iii) entertainment (amusement, excitement); and iv) interactivity (e-mail, live-chats, notice boards) (Alpar, 2001).
Bagtasos (2011) Key concept: Well-being of work	Family-work balance (Huang, Lawler & Lei, 2007); skills level, autonomy and challenge (Lewis, Brazil, Krueger, Lohfeld, & Tjam, 2001); job security and job stress (Saklani, 2004); management and supervisory style, satisfactory physical surrounding, job safety, satisfactory working hours and meaningful tasks (Ivancevich, 2001); nature of job, stimulating opportunities and co-workers (Wyatt & Wah, 2001); autonomy in decision making (Lewis, Brazil, Krueger, Lohfeld, & Tjam, 2001); belongingness, sense of becoming oneself and sense of being worthy and respectable (Gnanayudam & Dharmasiri, 2007); collective bargaining, industrial safety and health, grievance redressal procedure, quality circles, work-life balance, workers' participation in management (Padala & Suryanarayana, 2010); work attitude (Trau & Hartel, 2007); job experience of job content and job context (Ivancevich, 2001). In summary, quality work life (QWL) refers to work effectiveness and wellbeing in the work place.

Continued

Nicholson (2011) Key concepts: Exceptional, consistency, purposeful, accountable, transformative	1) Quality as exceptional, i.e., exceptionally high standards of academic achievement; 2) Quality as perfection (or consistency), which focuses on processes and their specifications and is related to zero defects and quality culture; 3) Quality as fitness for purpose, which judges the quality of a product or service in terms of the extent to which its stated purpose—defined either as meeting customer specifications or conformity with the institutional mission—is met; 4) Quality as value for money, which assesses quality in terms of return on investment or expenditure and is related to accountability; and 5) Quality as transformation, which defines quality as a process of qualitative change with emphasis on adding value to students and empowering them. (Harvey & Knight, 1996)
Welzant, Schindler, Puls-Elvidge and Crawford (2011) Key concept: Multidimensional	Many researchers agreed that quality is a multidimensional concept (Green, 1994; Vlasceanu, Grünberg, & Pârlea, 2007; Westerheijden, Stensaker, & Rosa, 2007). Therefore, reducing the concept to a one-sentence definition is problematic (Welzant, Schindler, Puls-Elvidge, & Crawford, 2011)
Hietschold, Reinhardt and Gurtner (2014)	Various definitions of quality, with commonalities: 1) fulfilment of customer requirements, 2) specification of products, services or processes, 3) organizational performance and 4) error free.
Herath and Albarqi (2017) Key concepts: Exceptional, consistency, purposeful, accountable, transformative	Financial reporting quality includes: relevance, faithful representation, understandability, comparability, verifiability, and timeliness. Quality has multiple meanings and multidimensional. It reflects various values and interpretation, and thus grounded in values, cultures and traditions (Adams, 1993). Quality as excellence or goodness and the degree of need fulfillment (Brunnström, et al., 2013; Martens & Martens, 2001; Jekosch, 2005). Generic definitions of quality include excellence (RCGP, 1994), expectations or goals which have been met (Steen & Li, 1988), "zero defects" (Crosby, 1979) or fitness for use (Juran & Godfrey, 1988; Campbell, Roland, & Buetow, 2000). Quality of life as physical, functional, emotional and social well-being (Cella, 1994). 1) Excellence or conformance to certain standard (apodictic approach) 2) Perfection or consistency (process specifications, zero defects, getting right the first time) 3) Purpose of product/service, or conformance to requirement (functional fulfillment) 4) Transformation of the participant/buyer (done for vis-à-vis to the customer, i.e. education) (Harvey & Green, 1993; Harvey, 2006; Hoyer, Hoyer, Crosby, & Deming, 2001).

Continued

	Problem to measure the quality of a service 1) Intangibility: not countable thus hard to measure 2) Heterogeneity: service quality differs with respect to employees and/or customers 3) Inseparability: service quality depends on the customer perception (Parasuraman, Zeithaml, & Berry, 1985)
Hartwig and Billet, (2018) Jonkisz, Karniej and Krasowska (2021)	Service quality results from the difference between the customer expectation and customer perception of the service (Grönroos, 1984; Parasuraman, Zeithaml, & Berry, 1985).
Key concept: Service quality is the gap between customer expectation and customer perception	SERVQUAL is a gap-model that describes the deviation between expected use of a service and experienced use of a service as the perceived quality of that service (Parasuraman, Zeithaml, & Berry, 1985). Nordic School "defines the dimensions of service quality in global terms as consisting of functional and technical quality", and the North American School "uses terms that describe service encounter characteristics (i.e., reliability, responsiveness, empathy, assurances, and tangibles)" (Brogowicz, Delene, & Lyth, 1990; Brady & Cronin Jr., 2001: p. 34) Findings showed that both SERVQUAL and SERVPERF "scales are adequate and equally valid predictors" of overall service quality (Carrillat, Jaramillo, & Mulki, 2007: p. 485).
Harju (2022) Key concept: Perceived quality is subjective and relative	Perceived quality is referred as how a consumer's subjective assessment of the product attributes depends on the consumer's perceptions, needs, and goals, suggesting that quality is neither absolute nor objective (Steenkamp, 1989). Perceived quality is also referred as the customer's perception of the overall quality or superiority of a product or service with respect to its intended purpose, relative to the alternatives (Aaker, 1991)
Afful-Dadzie, Afful-Dadzie and Egala (2023) Key concept: Information quality is based mainly on functionality	Information quality criteria: Credibility: source, currency, relevance, justifiability, transparency, authorship Content: accuracy, complementarity, disclaimer, reliability, clarity, balance Design: accessibility, usability, links Disclosure: potential conflict of interest Interactivity: feedback, chat rooms, tailoring (Silberg, Lundberg, & Musacchio, 1997; AHCPR, 1999; Charnock et al., 1999; Boyer et al., 1998)

Summary of literature reviews or meta-review reveals that quality is a multidimensional construct involving not just manufacturing concerns but also services, information technology applications, financial reporting, quality of work, quality of care in relation to quality of life, and relationship of supplier/customer. Moreover, there are other avenues yet to be explored such as quality of knowledge, brand, decision, solution, strategy, relation to value and well-being, and so forth. Quality is essentially dichotomized into Nordic school and North American school of thoughts i.e. functional/technical and objective vis-à-vis expectation/perception gap and subjective. Both ends of the spectrum are equally valid and important.

3. Quality Definitions

Definitions can be distinguished by prescriptive or descriptive view. A descriptive definition is a statement describing the meaning of a term or phenomenon. A prescriptive definition is a statement suggesting or demanding a specific use of a term. A prescriptive definition is a social convention, based on rules of communication or speech, and serves the uniformity of actions in a specified context, meaning what ought to be (Abelson, 1972; Harteloh, 2003).

Quality also comes in two perspectives; relative or apodictic (absolute). In relative term, it means different things to different people or stakeholders. In absolute term, it means there is no compromise such as zero defect. There is little agreement in the literature how quality is defined as there are various conceptualizations of the term. "Quality is notoriously elusive" (Gibson, 1986; Harvey & Green, 1993). "Quality is also a value-laden term: it is subjectively associated with that which is good and worthwhile" (Dochy, Segers, & Wijnen, 1990; Pfeffer & Coote, 1991; Harvey & Green, 1993).

Quality has been defined as excellence (Tuchman & Meredith, 1981), value (Zeithaml, 1988), conformance to specifications (Bellows, 2004), conformance to requirements (Saarinen Jr. & Hobel, 1990), fitness for use (Juran & Godfrey, 1988), product desirable attributes (Leffler, 1982), loss avoidance (Noori, 1989) and meeting customer expectations (Ryall & Kruithof, 2001; Elshaer, 2012). Quality defined as excellence is interpreted as related to beauty or aesthetics, and it is difficult to measure directly (but not impossible to measure). Quality as conformance to specification reflects the degree to which a product meets certain design standards which is manufacturing based concept (Reeves & Bednar, 1994). Nevertheless, customers may or may not know or care about the product conformance of internal specifications which may be irrelevant to them (Oliver, 1981). Moreover, quality as conformance to specification may be ill-equipped to address services (Reeves & Bednar, 1994; Sebastianelli & Tamimi, 2002).

"Quality" means those features of products which meet customer needs and thereby provide customer satisfaction. It is oriented to income. "Quality" also means freedom from deficiencies; freedom from errors or that result in field failures, customer dissatisfaction, customer claims etc. It is oriented to costs. "Conformance to specification" assumes products would meet customer needs. The question is whether the specifications meet customer needs and not the conformance per se (Juran & Godfrey, 1988). Juran (1999) distinguishes between quality as freedom from defects (small q) vis-a-vis quality as overall satisfaction of the customer (big Q). Juran and Godfrey (1999) defined quality as 'fitness for use', in association with customer requirements, and Garvin (1984) coined it the user-based approach. However, customer requirements are dynamic and continuous changing. A valid definition of quality may have to address the continuous review of customer requirements (Hoyle, 2007). But then again, often customers may not know what to expect especially with infrequently purchased goods/services (Cameron & Whetten, 1983). Defining quality based on meeting customer expectations

in a practical sense is most difficult to measure thus making the definition unreliable (Reeves & Bednar, 1994). Consequently, Elshaer (2012) defined quality as "a situation when a set of inherent characteristics consistently fulfill the continuously changing requirements of the organization's customers and other stakeholders". With Deming, Juran, and Feigenbaum influences, the quality movement evolved from mere inspection of products to total quality control (or Total Quality Management); expanding quality control from production to all departments, from workers to management, and to cover all operations in the company (Koskela, Tezel, & Patel, 2019).

In addition, Kano's theory of attractive quality discerns the relationship between the objective performance and customer satisfaction with an attribute. It evaluates quality based on customer satisfaction with respect to specific quality attributes and respective degree of sufficiency. The theory explains the relationship between the degree of sufficiency and customer satisfaction with different kinds of attributes. There are five perceived quality descriptors: "attractive quality", "one-dimensional quality", "must-be quality", "indifferent quality", "reverse quality" (Kano, 2001; Kano, Seraku, Takahashi, & Tsuji, 1984; Nilsson-Witell & Fundin, 2005). However, the distance to getting a comprehensive quality measurement is no closer.

Golder, Mitra and Moorman (2012) explication of the quality production and quality evaluation process (see **Table 2** below).

Table 2. Quality production process and quality evaluation process.

The Quality Production Process
1) The quality production process occurs when firms use attribute design and process design specifications to convert their resource inputs and those from customers into produced attributes. 2) Within this process, the state of produced attribute quality is an offering's produced attribute performance relative to the firm's attribute design specification. •Attribute design specifies the resource inputs (from firms, customers, or both), attribute performance, and attribute reliability that an offering must deliver. • Process design implements the attribute design by specifying how resource inputs are converted into produced attributes. 3) Quality control methods consist of a set of procedures for monitoring produced attribute quality and maintaining or improving the process design specifications. • Offline methods use experiments and simulations to improve produced attribute quality through changes in process design. • Online methods monitor produced attribute quality and make necessary adjustments to the production process while it is in progress. • Inspection methods measure resource inputs or produced attributes and reject those that do not meet specifications. 4) Resource inputs are the material and human resources used to generate produced attributes. Material resources include raw materials and intermediate offerings provided by the firm's suppliers. Human resources include physical labor, knowledge and insights provided by the firm's employees, suppliers, and, in cases of co-production, its customers.

Continued

The Quality Experience Process

1) The quality experience process occurs when firms (alone or with customers) deliver attributes for customers to experience and customers perceive these attributes through the lens of their measurement knowledge and motivation, emotions, and expectations.
2) Within this process, the state of experienced attribute quality is an offering's delivered attribute performance relative to a customer's 'ideal' expectation.
3) Attribute types
• Universal attributes are those for which customer preferences are homogeneous and measurement is unambiguous.
• Preference attributes are those for which customer preferences are heterogeneous and measurement is unambiguous.
• Idiosyncratic attributes are those for which customer preferences are heterogeneous and measurement is ambiguous.
4) Measurement knowledge is the customer's ability to assess attribute performance with minimal bias and variance relative to more objective measures.
5) Measurement motivation is the customer's desire to assess attribute performance with minimal bias and variance relative to more objective measures.
6) Emotion is the set of feelings evoked in customers during the quality experience process.

The Quality Evaluation Process

1) The quality evaluation process occurs when customers compare an offering's perceived attributes with their expectations to form summary judgments of quality and then satisfaction.
2) Within this process, the state of evaluated aggregate quality is the aggregation across attributes of an offering's perceived attribute performance relative to a customer's 'ideal' expectation.
3) Expectations are attribute performance reference levels a customer uses when perceiving and evaluating individual attributes.
• "Will" expectations are the attribute performance levels a customer predicts or believes an offering is going to deliver.
• "Ideal" expectations are the attribute performance levels that reflect a customer's ideal preferences across all offerings in a category.
• "Should" expectations are the attribute performance levels a customer believes competing offerings in a category ought to deliver.
4) Expectation uncertainty is the variance in a customer's expectation of an attribute's performance. Each type of expectations has a corresponding uncertainty: 'will' uncertainty, 'ideal' uncertainty, and 'should' uncertainty.
5) Accumulated information consists of stored customer knowledge accrued from a customer's own experiences, other customers' experiences, firm strategies (e.g., customer relationship and brand strategies), media reports, and quality signals associated with each attribute.
6) Quality disconfirmation is the aggregation across attributes of an offering's perceived attribute performance relative to a customer's 'should' expectation.
7) Customer satisfaction is a post consumption judgment that compares an offering's evaluated aggregate quality with its quality disconfirmation.

(Golder, Mitra, & Moorman, 2012).

4. Epistemological and Ontological Perspectives on Quality

Platonic epistemology starts from reason (reasoning from existing knowledge) and deduces prescriptions for applications in the real world. On the other hand, Aristotelian epistemology emphasizes observations made on the world and induction based on new knowledge (Koskela, Ferrantelli, Niiranen, Pikas, & Dave, 2018). Ontology representing process metaphysics (Rescher 2000), characterized its focus on temporal developments, and relations between phenomena. It starkly contrasts to the more well-known thing metaphysics, which directs attention to (relatively) stable things and their composition (Koskela & Kagioglou, 2005, 2006). Whether it is reasoning based vs. observation based or deduction based vs. induction based, a comprehensive definition of quality is still required.

Epistemological and ontological perspectives apply to quality theory construction by synthesizing and amalgamating the various quality components based on observations and reasoning (induction/deduction). Essentially, meta-synthesis adopts the constructionist locus.

5. Subjectivity vs. Objectivity on Quality

Quality is viewed in two perspectives: objectivity and subjectivity. Objective perspective views quality as reality independent of man; properties of product, product oriented, while the subjective side considers thoughts, feelings, senses and perception as reality; what customer wants, customer oriented (Nilsson-Witell & Fundin, 2005; Shewhart, 1931; Shewfelt, 1999; Zeithaml, 1988). Objective vis-à-vis subjective debate is more than centuries old. It has yet to be resolved. However, this paper presents a plausible argument.

5.1. Proposition 1

Objective vis-à-vis subjective perspectives is about the 'focus' of analysis. The focus of objective analysis is on the object, whereas the focus of subjective analysis is on the subject in the relationship of the subject perceiving/evaluating the object.

5.2. Proposition 2

Objective vis-à-vis subjective perspectives are both perceptions based. Subject perceives the object; the object is perceived by the subject. Subjective perceptive is based on subject's experience and self as the main point of references, whereas objective perspective is based on majority agreement or consistency, and thus also a relative perspective.

Note: Objectivity cannot be independent of man, simply because it is a 'perception'. In other words, a perceived object cannot be independent of the perceiver.

5.3. Proposition 3

Objectivity is a majority agreement/consistency of a perceived object. Objectivity does not equal to the truth.

Note: Because human perception is limited, and objectivity is perception-based, human cannot perceive the whole truth, and therefore, they are not equal. For example, centuries ago, human objective view of the Earth was flat, the current objective view is otherwise.

Objectivity applies to theory construction proposition 1-1 to 1-4, while subjectivity applies to proposition 1-5 t0 1-6 (see below).

6. Findings

Key words related to quality in an overarching meaning applied to all the various components or perspective are "goodness", "well-being" and "benefit". In addition, quality management is instrumental towards providing the goodness/well-being/benefit to meet customer's needs and wants. As such, this sets up the main premise for the theory construction of quality.

7. Meta-Synthesis

There is a customer fulfillment equation or process in relation to the quality construct that needs to be explicated:

Product/Service → Function → Benefit → Needs/Wants

Products/services embed functional attributes that carry the benefits to fulfill customer/consumer needs/wants.

Example:

Massaging Recliner/Massager → Massage → Comfort → Aches and Discomfort

The big Q/small q, conformance to specification, product features meeting needs, freedom from deficiency, fitness for use, customer satisfaction, fulfill customer requirement, meeting customer expectation, they all apply. Small q, freedom from deficiency, conformance to specification, are geared towards product locus and its functionality (specification, features). While big Q, fitness for use, meeting customer requirement, needs, expectation and satisfaction pertains to customer locus. Essentially, it is a balanced equation, just two main different perspectives. As a construct, quality is all the above in spite of various perspectives. As an abstract, quality is a value driver, and specifically, it is a benefit. This abstraction is more prominent in the value creation domain. In other words, if quality is not useful or beneficial, then it is worthless, and no value is created. If quality meets the highest standards of conformance to specifications and freedom from deficiency, yet it does not fulfill needs/wants, it is of little or no value. Contrarily, low standard of quality yet accepted by customer needs/wants presents itself as invaluable. Just like the vicissitude of life, there are no absolutes, just ups and downs, and the constant change.

The missing component is "benefit". Only the benefit delivered by product/service function can satisfy customer need/want, requirement and/or expectation. For example, massaging chair or massager provides the massaging function, the underlying benefit is "comfort", and the need/want is to mitigate or relief discomfort. Whether it is small q or big Q, all play a role in the customer fulfillment

equation/process described above. Essentially, "quality assurance" is about quality management assuring that the product/service underlying benefit fulfills the customer need/want, requirement and/or expectation. Product/service and their functions are observable, concrete and tangibles, on the other hand, benefits are abstract, intangible and more obscure. As such, 'quality' is a proxy measure of benefit. That is why quality has an embedded element of abstraction. "Quality" is explicated in the theory construction below.

8. Theory Construction

8.1. The What

Quality is the goodness of product/service.

8.2. The How

Goodness is measured by 1) specification, 2) frequency, 3) time effectiveness, 4) consistency, 5) majority agreement.

8.3. The Why

Quality is a benefit manifestation in product/service for the purpose of fulfilling customer need/want.

8.4. The So-What

Quality with the various perspectives is only part of the ubiquitous and omnitemporal value creation process.

8.5. Theoretical Statements

Quality is the goodness of product/service that fulfills customer need/want.

Quality management is the developing, controlling, studying product/service (task) to create/meet specification/functionality standards, and meet customer locus (need, want, requirement, expectation, satisfaction)

8.6. Proposition 1

Quality is measured by

1) Specification (physical attributes: size, shape, color, flexibility, surface smoothness…etc.; functional attributes: speed, toughness, brightness…etc.)

2) Frequency (count of success or failure in specification or functional outcome)

3) Time effectiveness (a. duration; b. real-time; c. on-time; d. in-time; e. time-period)

4) Consistency (measurement of 1 - 3 & 5 over time)

5) Aesthetics (audio, visual, tactile, olfactory, gustatory measurement in majority agreement of customers)

6) Expectation & Satisfaction (majority as the performance driver)

8.7. Proposition 2

Quality is the antecedent of value creation (i.e. sales performance) measured by

1) Sales (increase, new customer)
2) Repeat purchase
3) Customer referral
4) Share-of-wallet (proportion of budget allocated)

9. Conclusion

Despite the various perspectives of quality, this paper has amalgamated the quality construct into an overall view, and constructed a formal theory. This quality theory is inclusive in the overarching theme of value creation. This paper also calls for future research to verify or disprove the theoretical statements and propositions. This paper contributes to the quality literature and practitioners alike as a basis of reference and development of quality management at large. Other areas of exploration include quality in relation to various types of value sought by customers/consumers such as use (functional), exchange, hedonic (emotional), experiential, contextual, transformative (epistemic), social, and image value (Ledden, Kalafatis, & Mathioudakis, 2011; Ochocka, 2023).

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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