What can't be ignored in service quality evaluation: Application contexts, tools and factors

Lo que no debe obviarse al evaluar la calidad del servicio: contextos de aplicación, herramientas y factores

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Abstract

This paper locates a Relevant Literary Space (RLS) about service quality evaluation, between 2006 and 2011, in order to characterise the following: service typologies, evaluation approaches, measurement models, reliability indexes, scales, quantitative techniques, factors (or quality dimensions) and likely variables affected by them. For this we use a systematic literature review methodology, taking the Scopus database to browse the research papers. The procedure was carried out through the plan-do-check-act cycle. The findings show that the e-service is the most studied typology; the hybrid models are the most used as well as the 7-point Likert scale and Cronbach's **Coefficient Alpha** (average value of 0.87). Also, the findings show that the majority of the research community applies Structural Equation Modeling. From a holistic interpretation, a general structure of service quality is proposed. This article offers findings about the application of reproducible methods, open-to-scrutiny, and free of inclusion/exclusion biases of studies.

----------*Keywords:* Service quality, systematic review, state of the art

Resumen

Este artículo localiza un Espacio Literario Relevante (ELR) sobre la evaluación de la calidad del servicio, entre 2006 y 2011, con el fin de caracterizarlo desde: tipologías de servicio, enfoques de evaluación, modelos de medición, índices de fiabilidad, técnicas cuantitativas, factores (o dimensiones de calidad) y posibles variables afectadas por ellos. Se utilizó una metodología de revisión

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sistemática, empleando la base de datos Scopus para la localización de los estudios. El procedimiento fue llevado a cabo mediante el ciclo planear-hacer-verificar-actuar. Los resultados mostraron al e-service como la tipología más estudiada; los modelos híbridos, la escala Likert de 7 puntos y el coeficiente Alpha de Cronbach (media 0.87) resultaron ser los de mayor uso. Además, la mayoría de los estudios aplicaron la técnica de Modelos de Ecuaciones Estructurales. Desde una interpretación holística, se propone una estructura general de la calidad del servicio. Este artículo ofrece resultados derivados de métodos reproducibles, abiertos al escrutinio y libres de sesgos de inclusión/exclusión de estudios.

----------*Palabras claves:* Calidad del servicio, revisión sistemática, estado del arte

Introduction

A study of service quality is one of the most significant elements regarding competitiveness because it allows companies to achieve better performance regarding value-offer design for their customers. Service quality can be understood, generally, as a latent construct that shows how well a service satisfies customer expectations, considering their perceptions only [1], or the gaps between these perceptions and expectations [2] (two different evaluation approaches). For a better understanding of the service quality concept and its complex assessment, the literature has provided *reviews* or *state of the art* studies, which are considered a first requirement to inspire the development of primary research works. Current theoretical contributions regarding service quality, although relevant for science and engineering, have gaps that relate to the sort of review upon which they are based: the narrative review. This kind of review may cause biases due to the possible inclusion of studies that are in agreement with the reviewer's viewpoint, and the exclusion of studies that contradict their mental models. In addition, the narrative review is not open-to-scrutiny because its method is not reproducible, and it does not allow identification of all the relevant information sources, among other limitations [3-5].

Apart from the possibility of improving the review methodology, the current service quality literature reveals an opportunity: the low number of review papers about the current situation and future research regarding aspects of service quality evaluation can set the stage for novel research agendas. As supporting evidence, consider the following Scopus exploration of service quality which was undertaken on January 8, 2014. Scopus is the biggest database on abstracts and literature reviewed by experts [6-8]. The search algorithm contained the word 'service *quality'* in the *title* option solely, in order to retrieve papers for which this subject is the core topic. After running the algorithm, the database found 3.163 documents. With the purpose of retrieving review papers only, the following words were attached to the *title* option: review, state of the art. Finally, the algorithm used was: *TITLE ('service quality') AND TITLE (review OR 'state of the art')*. The document recovery shows just 33 review papers.

However, after checking each of these 33 papers, just 15 really matched the review article criteria. The remaining 18 papers were about other subjects such as healthcare processes and quality of service (QoS) or, despite being service quality research papers, were in fact primary research papers instead of review articles (for example, models' development, quality service evaluations, confirmatory factor analysis). In addition, by further filtering the 15 research papers, three were published after 2010: [9-11]. The first one focuses on a review with a systematic approach, limited to the healthcare context (47 papers reviewed;

scientific databases: Ebsco, Emerald Insight, ABI-Inform). The second and third research papers are about the banking sector and higher education, respectively. Both of them are narrative reviews. Some the other documents published before or in 2010 are: [12] (Internet environment), [13] (real estate), [14] (healthcare: diabetes; 47 studies) and [15] (alternative industry-specific measurement scales, 30 studies). These last two research papers had a systematic component in the review. This Scopus database exploration led to the view that there is little research production carried out with reproducible, open-to-scrutiny, objective and holistic criteria, about the current situation and future research regarding service quality evaluation.

Because of both gaps in the literature and the significance (and complexity) of the study of service quality, it was considered important to conduct a systematic review, without being constrained to specific economic sectors (service typologies). This is done in order to address the following questions: (P1) which are the most relevant service quality research papers for the academic community, with this subject as core topic, and published between 2006 and 2011?, (P2) How much that identified literary space represents the whole collection of the most relevant research papers in the academic community? (P.3) What characteristics have the service quality studies presented, as a core topic, between 2006 and 2011, regarding: service typologies, evaluation approaches, measurement models, reliability indexes, scales, quantitative techniques for hypothesis testing, factors (or quality dimensions) and likely variables affected by them?

Materials and methods

This paper carried out a systematic review methodology [5], taking the Scopus database to browse the research papers. Figure 1 portrays the browse space delimitation. As can be seen, the browse took place on April 23, 2012. This delimitation represents: a) Scopus's criteria for journals (standard peer review, conformity with technical quality standards, abstracts in English and timely edition); b) additional criteria of article (primary studies, central topic, areas of interest, published between 2006-2011, major number of citations - popularity-, and service quality from attitudinal aspects).

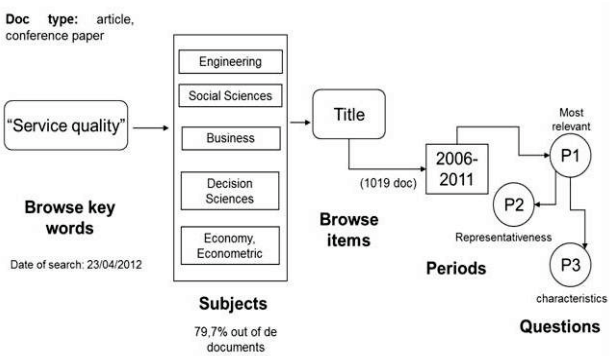

Figure 1 Delimitation map for the service quality literary space

The procedure was carried out through the plan-do-check-act cycle. The literary space was delimited to articles and conference papers in order to include only primary studies. In addition, for quality control purposes, a random sample of papers is verified involving the following criteria: 95% reliability level, 5% error estimating for *p* parameter: the proportion of papers studying *service quality* from the customer perceptions-only approach or the perceptions-expectations approach, and that these are not review articles. In the verification, equation 1 allows calculation of the sample size of papers (*n*):

$$n = \frac{n`}{1 + \frac{n`}{N}} \qquad (1)$$

Equation 2 details the variable *n'*:

$$n` = \left(\frac{K}{\varepsilon}\right)^2 \times p(1-p) \qquad (2)$$

K is the coefficient for a (1-α)% confidence level, which derives from the normal distribution, and ε is the maximum acceptance error for estimating

p. Using these defined criteria (K = 1.96, ε = 0.05, p = 0.68, N = 1.129), the sample size is 257 documents. For calculation of the p-value, this study is based on the number of papers in the *computer scien*ce field (359 documents); this field tends to study the *Quality of Service* or *QoS* subject (which is different from the terminology *service quality*) which refers to the data-transmission continuity (in electronic devices). The quality-control results were tabulated in Excel. Table 1 presents some of these results.

Table 1 Some of the quality-control results

Paper	*N°*	*Rank*	*Does it meet the required criteria?*	*Citations*
[16]	1	404	Yes	1
[17]	2	673	Yes	0
[18]	3	648	No	0
[19]	4	310	Yes	2
[20]	…	734	Yes	0
[21]	235	177	Yes	4

After the quality control, 25 out of the 257 papers were discarded because of violation of the quality criteria. This leads to an estimate of the p-experimental around 0.90. The excluded papers, considering the Top 50, were: [22-26].

Results

The relevant literary space for the service quality study, published between 2006-2011 (Top 50)

Tables 2 and 3 contain the relevant literary space (RLS), constituting the Top 50 most cited research papers in Scopus, after the quality control. In particular, table 2 shows the first 10 positions (Top 10) and provides details of the papers (i.e. journal, article title…), whereas table 3 shows the remainder of the Top 50 but considers the citations only, due to this manuscript extension criterion.

Table 2 RLS (Top 10, after the quality control)

Paper	*Rank*	*Title*	*Journal*	*Citations*
[27]	1	Measuring service quality in E-retailing	Journal of Service Research	118
[28]	2	eTransQual: A transaction process-based approach for capturing service quality in online shopping	Journal of Business Research	84
[29]	3	Perceived e-service quality (PeSQ): Measurement validation and effects on consumer satisfaction and web site loyalty	Managing Service Quality	48
[30]	4	Service quality, customer satisfaction, and behavioral intentions in the service factory	Journal of Services Marketing	47
[31]	5	Measuring service quality in the hotel industry: A study in a business hotel in Turkey	International Journal of Hospitality Management	40
[32]	6	Towards an understanding of total service quality in hotels	International Journal of Hospitality Management	36
[33]	6	The development of an e-travel service quality scale	Tourism Management	36
[34]	6	A hierarchical model of health service quality: Scale development and investigation of an integrated model	Journal of Service Research	36
[35]	9	Assessing tourist behavioral intentions through perceived service quality and customer satisfaction	Journal of Business Research	35
[36]	10	A service quality measurement architecture for hot spring hotels in Taiwan	Tourism Management	34

Table 3 Other ranking of RLS (after the quality control)

Rank	Papers	Cit.	Rank	Papers	Cit.	Rank	Papers	Cit.	Rank	Papers	Cit.
11	[37]	32	21	[47]	23	31	[57]	17	41	[67]	15
11	[38]	32	21	[48]	23	31	[58]	17	41	[68]	15
13	[39]	31	21	[49]	23	31	[59]	17	41	[69]	15
14	[40]	30	24	[50]	22	31	[60]	17	41	[70]	15
15	[41]	27	25	[51]	21	35	[61]	16	41	[71]	15
16	[42]	25	25	[52]	21	35	[62]	16	41	[72]	15
16	[43]	25	25	[53]	21	35	[63]	16	47	[73]	14
16	[44]	25	28	[54]	18	35	[64]	16	47	[74]	14
16	[45]	25	28	[55]	18	35	[65]	16	47	[75]	14
20	[46]	24	28	[56]	18	35	[66]	16	50	[76]	13

Representativeness of the relevant literary space for the service quality study

Table 4 presents exploratory evidence of how much the Top 50 represents the most relevant papers. Table 4 uses the following indicators [5]: Percentage of documents relative to Top (pDAT) and Percentage of citations relative to Top (pCAT).

Table 4 RLS Representativeness

Period	(A) Total papers after the quality control (QC)	(B) Total papers in the Top	pDAT: (B)/(A)	(C) Total citations after the quality control (QC)	(D) Total citations in the Top	pCAT: (D)/(C)
2006-2011	1.019	50	4.9%	3.059	1.307	42.7%

The relevant literary space (Top 50) only represents 4.9% of the whole document population, under the browse criteria and after the quality control (1.019 papers), but consolidates 42.7% of all citations.

Characteristics of the relevant literary space for the service quality study

Service typologies: table 5 shows the service typologies; it is worth noting that e-service and hospitality are the most frequent.

Table 5 Service typologies in the RLS

Services	Frequency	Accumulative absolute frequency	Relative Frequency	Accumulative relative frequency
e-Service	11	11	22%	22%
Hospitality	8	19	16%	38%
Aviation	5	24	10%	48%
Banks	4	28	8%	56%
Multi-services	2	30	4%	60%

Services	Frequency	Accumulative absolute frequency	Relative Frequency	Accumulative relative frequency
Education	3	33	6%	66%
Healthcare	3	36	6%	72%
Call center	2	38	4%	76%
Restaurants	2	40	4%	80%
Transport	1	41	2%	82%
Libraries	1	42	2%	84%
Real estate	1	43	2%	86%
Skiing	1	44	2%	88%
Dentistry	1	45	2%	90%
Spa	1	46	2%	92%
Telephony	1	47	2%	94%
Travel Agencies	1	48	2%	96%
Insurances	1	49	2%	98%
Logistics	1	50	2%	100%

Evaluation approaches: The customer perceptions-only appears in the majority of the Top 50 (64%), whereas the gap between expectations and perceptions consolidates the 32% (4% of the papers do not provide this information).

Measurement models: 45 documents provided information about the measurement models. Table 6 summarizes these findings.

Table 6 Measurement models in the RLS

Models	Frequency	Accumulative absolute frequency	Relative Frequency	Accumulative relative frequency
Hybrid models	14	14	31%	31%
Servperf (Servqual perceptions-only)	9	23	20%	51%
Servqual-pure (perceptions vs. expectations)	7	30	16%	67%
SERVMO	3	33	7%	73%
Hierarchical multidimensional	3	36	7%	80%
Models proposed by the authors	2	38	4%	84%
Bank Service Quality (BSQ)	1	39	2%	87%
HEdPERF	1	40	2%	89%
IS-SERVQUAL	1	41	2%	91%
PeSQ	1	42	2%	93%
SERVMO	1	43	2%	96%
eTransQual	1	44	2%	98%
GIQUAL	1	45	2%	100%

Reliability indicators: in the RLS, authors use Cronbach's Alpha and Composite Reliability as reliability indicators. The majority use Cronbach's Alpha only (68% out of the 38 papers that report on the reliability). Figure 2 presents the percentages of use of these indicators.

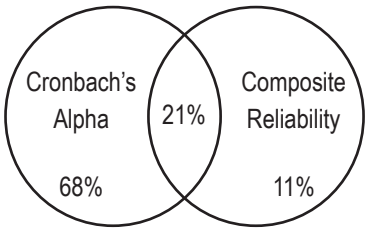

Figure 2 Percentages of research papers depending on reliability indexes

Comparing the values for these two indicators, the average for the Cronbach's Alpha measurement, considering all values reported on papers from the RLS, was 0.87, and the Composite Reliability average was 0.83.

Measurement scales: 44 papers provided information about the scales. Table 7 details the respective frequencies; it is worth highlighting that the most common are the 7 and 5-point Likert scale.

Quantitative techniques: table 8 exposes the use of statistical techniques in the RLS. The use of Structural Equation Modelling (SEM) is the most frequent for hypothesis testing and causal-relationships analysis (48% out of the papers applied this technique).

Table 7 Measurement scales used in the RLS

Scales	*Frequency*	*Accumulative absolute frequency*	*Relative Frequency*	*Accumulative relative frequency*
7-point Likert	25	25	57%	57%
5-point Likert	13	38	30%	86%
10-point Likert	2	40	5%	91%
5-levels Linguistics	2	42	5%	95%
9-point Likert	1	43	2%	98%
11-point Likert	1	44	2%	100%

Table 8 Quantitative techniques used in the RLS

Quantitative techniques	*Frequency*	*Accumulative absolute frequency*	*Relative Frequency*	*Accumulative relative frequency*
Structural Equation Modeling (SEM)	24	24	48%	48%
Regression analysis	12	36	24%	72%
Variance analysis (ANOVA)	3	39	6%	78%
Structural invariance analysis	1	40	2%	80%
Factor Design 2 x 2	1	41	2%	82%
Choquet integral	1	42	2%	84%
EDEMATEL fuzzy model	1	43	2%	86%
DEMATEL gray-fuzzy model	1	44	2%	88%
Multinomial-Logit (MNL) model	1	45	2%	90%
Analytic Hierarchical Process (AHP)	1	46	2%	92%
Analytic Network Process (ANP)	1	47	2%	94%
T-test	1	48	2%	96%
Only factor analysis	1	49	2%	98%
LADDER-MAPPING	1	50	2%	100%

Factors (quality dimensions) and likely variables affected by them: figures 3-10 show the factors or service quality dimensions present in each one of the service typologies identified, and the response variables affected by them. The letters appearing in brackets are codes to identify the corresponding paper where the relations are proposed (see the Figure numbers for the correspondences).

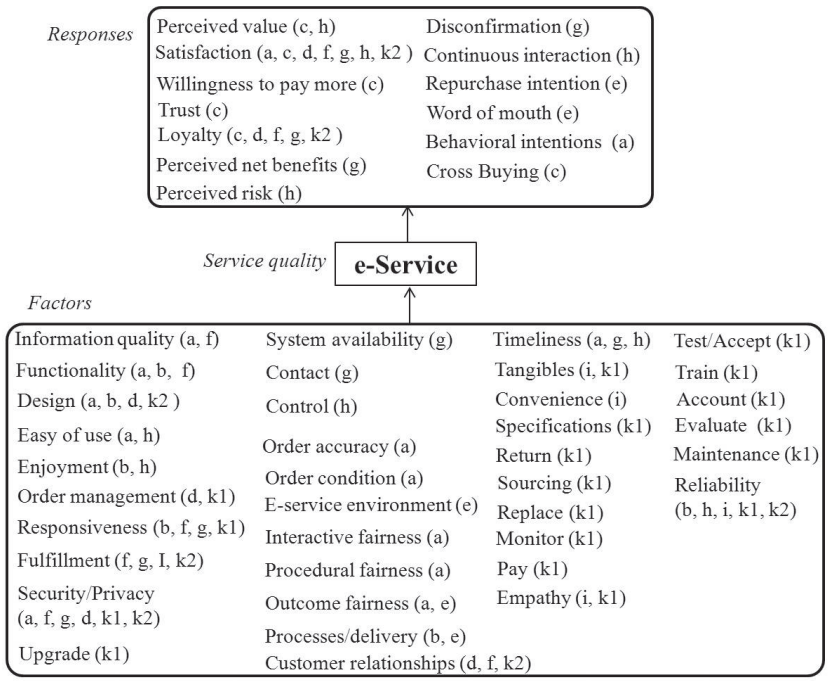

Figure 3 Factors and likely variables affected: e-service. Keys: a [27], b [28], c [37], d [29], e [61], f [33], g [43], h [44], i [38], k1 [50], k2 [52]

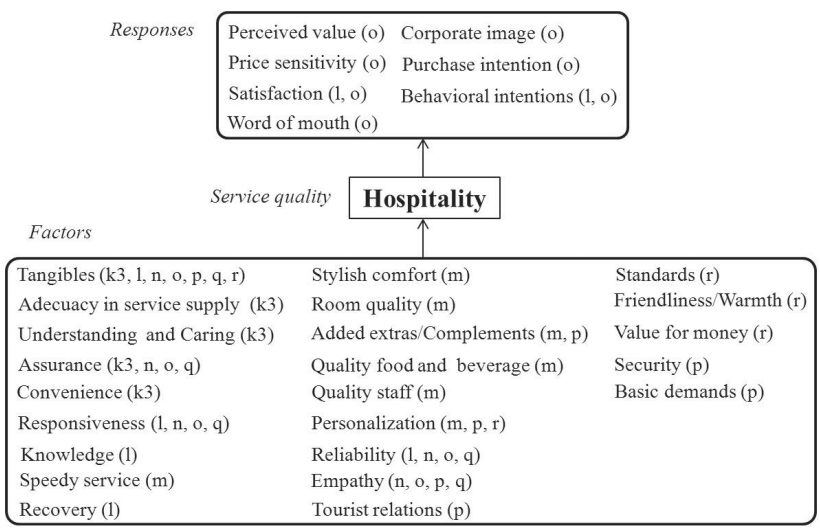

Figure 4 Factors and likely variables affected regarding hospitality. Keys: k3 [31], l [30], m [32], n [36], o [39], p [56], q [54], r [58]

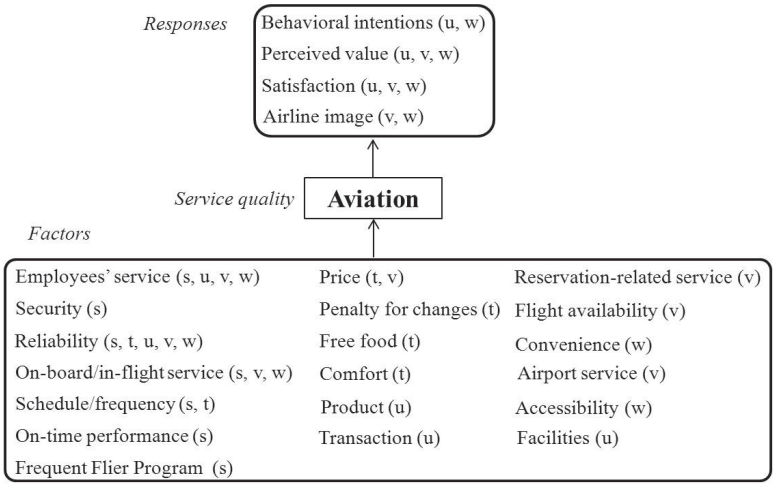

Figure 5 Factors and likely variables affected regarding aviation. Keys: s [41], t [72], u [51], v [62], w [75]

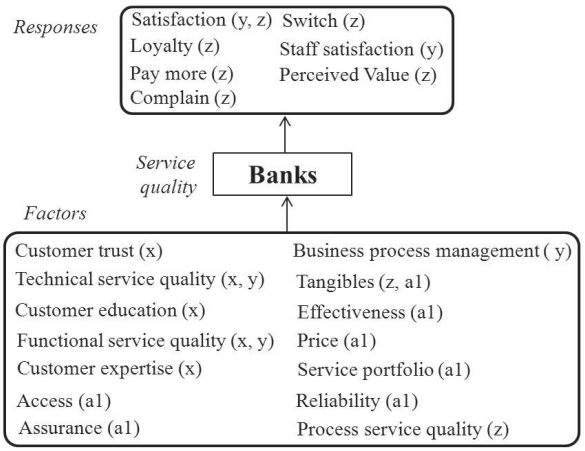

Figure 6 Factors and likely variables affected regarding banks. Keys: x [73], y [69], z [74], a1 [71]

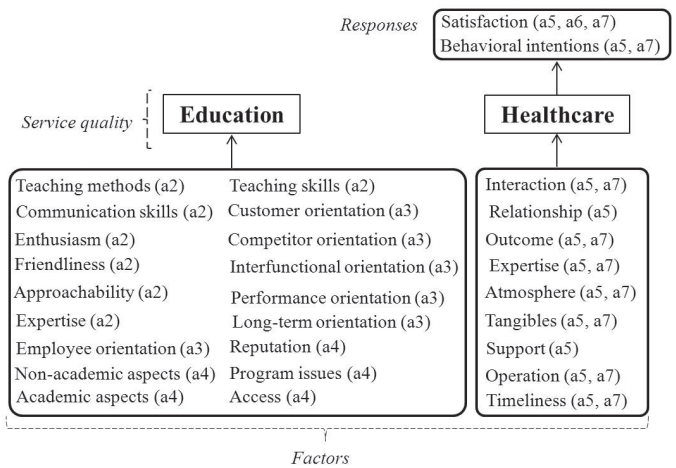

Figure 7 Factors from education and healthcare services. Keys: a2 [40], a3 [60], a4 [66], a5 [34], a6 [59], a7 [70]. The studies from the education context did not consider response variables

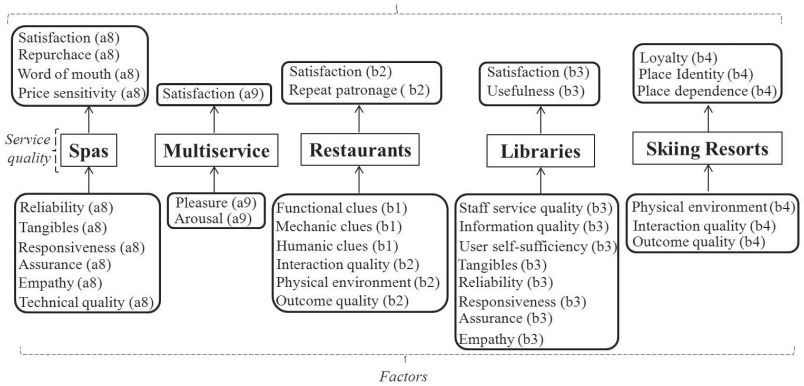

Figure 8 Factors from spas, multiservice, restaurants, libraries and skiing services. Keys: a8 [35], a9 [46], b1 [45], b2 [47], b3 [55], b4 [49]

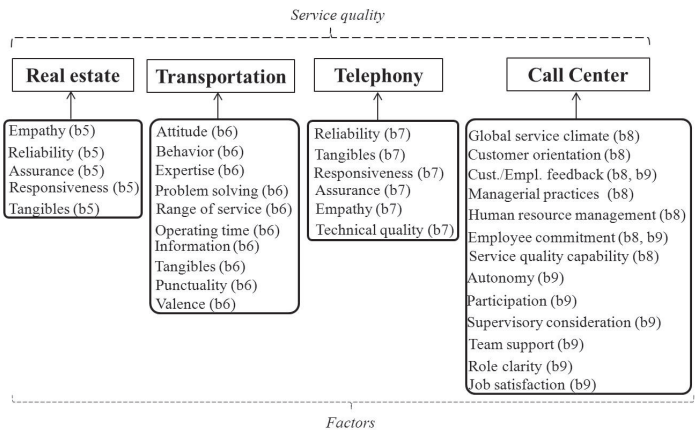

Figure 9 Factors from real estate, transportation, telephony and call centre services. Keys: b5 [42], b6 [48], b7 [65], b8 [63], b9 [53]. None of these studies considered response variables

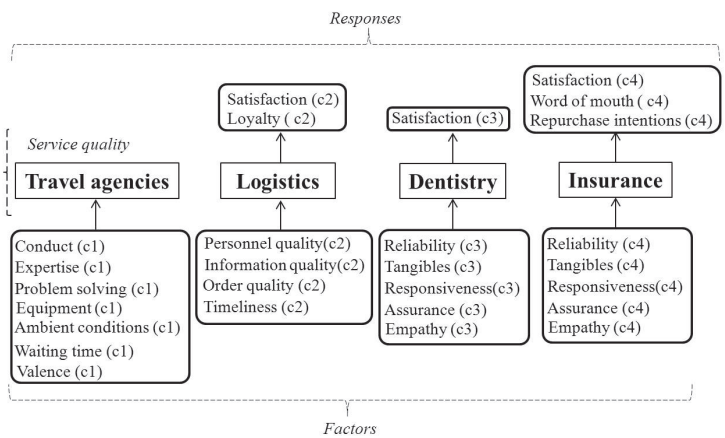

Figure 10 Factors from travel agencies, logistics, dentistry and insurance services. Keys: c1 [57], c2 [67], c3 [68], c4 [64]

Discussion and conclusions

The e-service is the most common service typology in the Top 50 (22%, see Table 5). This fact corroborates the importance of virtual environments for the interaction between companies and customers. These virtual environments are evolving constantly due to, among others, the development of ICT. The second most frequent service typology is the hospitality service (16%). This finding is consistent with current economic trends, showing the hospitality service as one of the sectors of most foreign exchange earners in the entire world [77]. The less common service typologies in the RLS are libraries, real estate, skiing and dentistry, among others, becoming services that may need further study.

Regarding the evaluation approaches, the customer perceptions-only prevails in the RLS (64%). This is consistent with [1], who argue that service quality models, limited to customer perceptions-only, generally have higher levels of reliability and validity. In relation to the measurement models, the hybrid models (see Table 5) are the most common in the study of service quality. Their construction comes from several pre-existing models, previously explored in the literature. In this case, the different constructs are customised and conditioned by diverse characteristics from each service context and the specific interest of each study. The second and third models that are most often used are Servperf (perceptions-only) (20%) and Servqual-pure (perceptions vs. expectations) (16%), respectively. The Servqual consists of five quality dimensions: reliability, responsiveness, assurance, empathy and tangible [2]. The category *models proposed by the authors* involves papers on which the measurement models are an entirely original product of the author. Regarding the reliability indexes, most of the authors use Cronbach's Coefficient Alpha (68%). Generally, the minimum reference value for this indicator is 0.7; however, the present findings show that it is necessary to get an average of 0.87 in order to be at the level of the most relevant papers about service quality. Considering the quantitative techniques, 24 out of the Top 50 (48 %) apply Structural Equation Modelling. This signals the increasing importance of this analytical technique in service quality research.

In relation to the quality dimensions identified, it can be seen that, depending on the specific application context, there are particular factors that influence customer perceptions of service quality. However, independent of the service typology, there are several factors that might take place in any service context, allowing the identification of a generic theoretical structure. This generic theoretical structure (factors and likely variables affected by them) is proposed in figure 11.

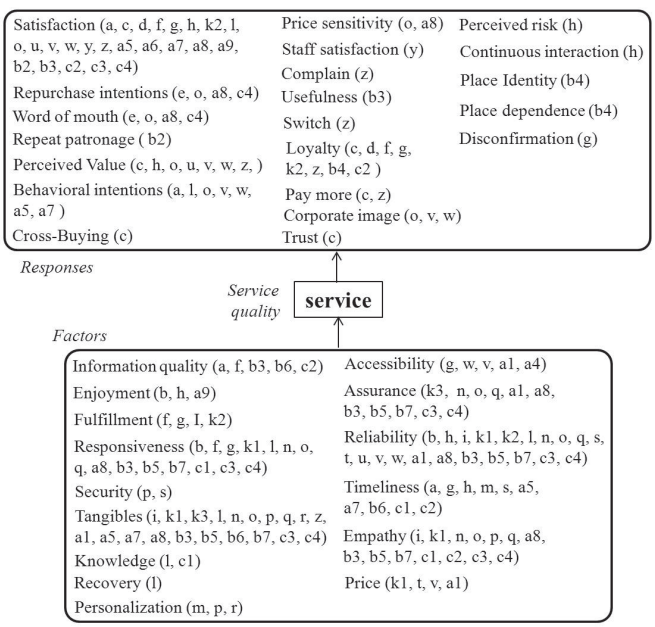

Figure 11 Structure proposed. The keys appearing in brackets may be checked in figures 3-10

Regarding the response variables, they are all considered by the literature to be independent of the service contexts, because the same cognitive and emotional effects take place after service consumption.

Table 9 contains the proposed definitions for each one of the general theoretical factors identified.

Table 9 General service-quality factors and their definitions

General factors	*Definition*
Information accuracy/ quality	The service provider presents information about the product/service in a clear and precise manner.
Enjoyment	The service consumption is hedonic and pleasurable for the customer. So, the customer 'enjoys' the service experience.
Fulfilment	The provider delivers a service in the arranged and promised conditions/specifications to the customer.
Responsiveness	The service provider answers the customer's questions/requests or solves the problems, during and after service consumption.
Security	The service provider makes the customer feel secure and safe, during and after the service consumption.
Tangibles	Regards the tangible aspects of the physical/virtual environment where the service is performed (e.g. facilities appealing, neat staff appearance, visual attractiveness…)
Empathy	Refers to the personnel/staff behaviour, during and after service consumption (e.g. friendliness, understanding and caring, polite and warm communication…)
Personalisation	Refers to the individual treatment that the service provider gives to the customer, depending on his particular or specific needs.
Recovery	The service provider reacts rapidly when an error occurs or something unexpected happens.
Accessibility	The service is 'available' to the customer, every time he requires it. In other words, the customer gains access to the service when he demands it.
Assurance	Capability of the service provider to inspire trust in the process of performing services.
Reliability	Capability of the service provider to perform the promised service accurately and without errors.
Timeliness	Capability of the service provider to deliver a speedy service and at the promised time (avoiding waiting times.)
Knowledge	The competence and knowledge of the service provider to 'do the job' (expertise, possession of necessary skills…)
Price	The customer's perceived cost of the service delivered.

The characterisation topics (service typologies, measurement models, reliability indexes, etc.) explored in this paper make possible a deeper understanding of aspects of general interest for researchers and managers. It allows, simultaneously, findings that portray the most vital and current thinking regarding the service quality. Future studies should consider, at least, the following methodological keys: hybrid model design, 7-point Likert scale, customer perceptions-only approach, Cronbach's Alpha indexes close to 0.87 or higher, causal-relationships analysis, the general theoretical factors identified, and the likely variables affected by them. The current findings, which are not constrained to a particular service typology, are favourable, at an exploratory level, for possible generalisation to any service. This supports, for example, what [9] propose in their review study. These authors review service quality exclusively in the healthcare context, considering a sample of 47 research papers, which shows the following: Cronbach's Coefficient Alpha as the most used reliability index, the Servqual as the most applied measurement model (49% of cases) as well as the 7 and 5-point Likert scales. Furthermore, [9] highlight the dependency on the Servqual model and invite the academic community to realise research contributions transcending the healthcare context.

In the present manuscript, we try to select the most relevant research papers, selecting the Top 50 through the quality control criteria described in the methodology section. It should be noted that, in [9], the reliability indexes do not meet the minimum value of 0.7 traditionally required. Instead, these authors show that 22 out of the 47 papers reviewed present Cronbach's Alpha values that they catalogue as *high*, considering the value of 0.6 as minimum criteria (p. 327). Nevertheless, in the present Top 50, the Cronbach's Alpha values range from 0.65 (hospitality: [39]) to 0.99 (dentistry: [68]) with an average of 0.87. As additional supporting evidence, [79] reviews a sample of 27 research papers, limited to the e-service context. This author pays special attention to the need for studying the particularities of each service typology, which has been noted in the present manuscript, as an interpretation of the hybrid models. From the higher-education context, [11] highlights, in a narrative type review, the importance of Servqual as a theoretical basis for the research in such a context. However, the author also comments on the need for identifying particular dimensions for each context.

With the localisation of the relevant literary space, according to the browsing algorithm as well as the specific quality control criteria, this study answers the need for identifying the main research products about service quality. This is carried out using reproducible, systematic and open-to-scrutiny criteria, allowing the gathering of vital information that the academic community cannot ignore in order to generate new research agendas in the service quality field.

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