

Analysis of the Dimensions of Quality Perceived by Clients of Online Retail Organizations

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Abstract

The transformation in customer experience promoted by the advent of Web 2.0 has led to the measurement of customer perception of quality to consider more hedonic and subjective aspects of quality. Since there is no consensus in the literature on what the quality attributes of electronic services are and how they are organized, the objective was to investigate how to organize the objective and hedonic attributes of quality in online retail, based on the model of e-transqual measurement. For data analysis, descriptive statistics, and exploratory factor analysis (EFA) techniques were used. It is concluded that online retail companies should focus on technical characteristics, but should not overlook the hedonic aspects of quality, so as to make the customer experience during the buying process more enjoyable and thus ensure higher levels of quality. quality perception.

Keywords: Consumer experience; hedonic aspects; measurement; electronic service; retail online.

1. Introduction

The development of information and communication technologies (ICT) has changed the traditional economy, allowing the emergence of electronic businesses (e-business). Among these, business-to-consumer (B2C) e-commerce can be highlighted, also known as online retail, which is truly relevant to the economy [1]. In this context, the evolution of the web ended up impacting the way of using the Internet not only from the point of view of organizations, but also of their customers. Web 2.0 starts to position its users as central elements, in a context of greater interactivity and empowerment, changing the browsing experience [2,3].

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The traditional e-commerce sector grew 12% in 2018 when compared to 2017 and 2019 is expected to be a good year for the segment, so that a market growth of about 15% is expected in relation to 2018, which would represent about 61.2 billion reais [4]. In this context of changing the browsing experience on the part of the customer and the consequent need to adapt online retailing, studies emerge that defend the position with not only objective or utilitarian aspects are related to the perception of quality on the web, but also, aspects more correlated to subjectivity, which connect to the perception of quality hedonic elements, those associated with the feeling of enjoyment [5, 6, 7]. There is a need to conduct research on quality perception in different locations, considering different dimensions, since the perception of dimensions for each e-service segment can vary. Among the motivations for conducting the research, its contribution to the quality literature in electronic services can be highlighted, as the consideration of hedonic and subjective aspects for quality measurement can provide a better understanding of the concept of quality in the online environment [5, 8]. In addition to its theoretical contribution, the research also presents practical contributions. Electronic retail organizations are facing the dilemma of reducing expenses while hoping to produce positive results. For that, it is necessary an effective management, which correctly allocates the various resources existing in its processes [9]. In this sense, the knowledge of customer preferences in relation to the aspects of qualities present in online retailers is a competitive differential. Due to the easiness that the consumer could access another retailer, his level of perception of quality influences the decision to switch to a competitor or remain in the same service [10]. Given the importance of quality perception of online retail companies, several studies aimed to identify and propose dimensions to measure the quality of electronic services. However, there are divergences in the literature about which dimensions are relevant and how they are organized [8, 11, 7]. Thus, the following research question is formulated: How are the relevant objective and hedonic aspects organized to measure the perception of quality by customers? To answer this question, the present research has the general objective of analyzing how the objective and hedonic attributes of quality are organized in online retail under the view of customers. In order to achieve a general objective, the following specific objectives were outlined: to ascertain the importance of the attributes of measurement of quality dimensions in online retail and to verify how the attributes are distributed among the dimensions.

2. The evolution of the internet and online retail

The advancement in the development of information technology (IT) is responsible for a shift from the industrial economy to an information-based economy [12]. In this new era of economics, the Internet and other online technologies are responsible for modifying various aspects of human life, including the way of doing business [9, 13, 14]. Then there are business models that come to be operationalized through the Internet, they are called electronic businesses or e-business. In this context, electronic commerce or e-commerce, is seen as a relevant component for the growth of organizations in this century, because in addition to serving as a platform for exposing new businesses, it also enhances the reach of existing companies, in a way to strengthen the relationship with customers [15]. Among the modalities of electronic commerce, online retail can be highlighted, understood as a direct electronic channel for sales of products and services from companies to consumers. Its benefits include dynamism between buying and selling and low investment costs [9]. In relation to the benefits identified with the advent of e-commerce compared to the traditional sales channel, it is possible to emphasize the ease of access and the research process, whose buyer find the most appropriate offer in relation

to the brand, price, delivery and freight [16]. In view of the previous argumentation, it is emphasized the fact that there are no limitations arising from distances and opening hours, offering greater convenience to the customer. Another different aspect on the part of the services offered by the Internet, concerns the construction of the relationship between the customer and the company, in which the face-to-face interaction between customer and seller, a hallmark of traditional retail, it is absent in the online environment because the interactions occur through a website [17]. The companies can increase their sales through the greater reach provided by the Internet in the online environment, that means, the product is presented to a greater number of people, increasing the sales potential, both in terms of the amount of information offered about products for sale, as well as consumer's profile [18]. The importance of the content, aesthetics and usability of retail websites is of vital importance for customers, since they are responsible for the relationship between the company and the consumer, the perception of quality by customers in relation to the website can promote an experience of continuity in navigation, which is important to enhance their perception of value, thus influencing the performance of the online retail company [19, 5, 7]. With the transformation in the web environment provided by IT, companies were able to perceive an important aspect to beat the competition: taking advantage of the integration of services offered. Once recommendations are propagated among users, the effects of the users' contribution network can determine a company's success. The services offered by the web started to take advantage of the power of the users themselves, improving due to the collective activity [20, 21].

3. Quality in electronic commerce

To understand the concept of quality in online commerce, it is necessary to consider aspects of quality of services and information systems. The latter, since websites are, in essence, information systems [22, 19]. In technical terms, the quality of the system can be understood as an object-oriented expectation, where this object is expected to have specific attributes for achieving objectives [23, 22]. The quality of the system concerns the quality of processing of the information system itself, which comprises software and data components, corresponding to the degree to which the system is technically correct. In this sense, some of the dimensions used to assess quality in information systems are adaptability, availability, reliability, response time and usability (or ease of use) [22, 24]. As for the quality of information, the definition "adequacy of information for use" is frequently used in the literature [22, 25, 26]. The quality of information is understanding as the quality of the output of what is produced by information systems, considering both the reports generated and the online screens [24]. In their version of the successful model in information system for the context of e-commerce, the authors in [22] introduced service quality as an independent variable in the model. The authors define quality of service as everything delivered by the service provider to the user and point the user of the service delivered by the information system, in the context of electronic commerce, as the customer, and that support with low levels of delivery translate into lost customers and sales. The insertion of the category, or dimension, quality in services is important because it allows the consideration of the client's perspective for quality assessment. Given the variety of approaches for measuring e-service quality, it was possible to understand that users of the online environment (or web systems) did not perceive quality exclusively when judging technical and objective aspects [5]. Nevertheless, several studies are beginning to underline the relevance of non-technical, or hedonic, aspects for the perception of quality in this type of environment [7, 8]. In this way, the hedonic (and consequently subjective) aspects are taken into consideration by researchers both for the definition of quality, and for the

establishment of measures and aspects relevant to the perception of quality. In the hedonic perspective of quality in the system, there is a concern with cognitive, sentimental, enjoyment and fun aspects related to the use of the system and its influence on the individual perception of quality [27; 28]. In this context, the quality of the system goes from its orientation to the object and starts to an orientation to the process, concerned with the construction of emotional motives [29]. Regarding the perception of quality from the perspective of the service literature, quality in e-services due to the facilities that websites provide, and these are aspects related to the efficiency and effectiveness of purchases, deliveries of products and services. With this, one can expand the domain of quality in e-service, since the concept of the simple notion of online transaction is separated from a more comprehensive view that takes into account aspects of before, during and after transactions [30]. As much as the authors use the term quality of electronic services, in their research this type of service refers to the purchase service that can be performed through a website. That is, despite the use of the nomenclature "services", much of the insights regarding quality in this electronic context is related to what was previously defined as electronic commerce (e-commerce) and online retail [30]. The quality in the electronic service, or e-service, presents a multifaceted concept, therefore, several dimensions and measures are used to deal with its measurement [8, 25]. In addition, as explained before, for each type of electronic service, the configuration of dimensions and the items of the scale for measurement may be different. Since the purchase and sale services are, for the most part, operated by websites, the quality of these is understood as fundamental for high levels of perceived quality in the whole e-service. In order for the perception of quality to be effective, the quality of the system and the quality of the information delivered by it, must be understood both in terms of compliance with requirements for operation, and in relation to the promotion of a playful and smooth navigation [31, 27, 29]. Since the quality of the electronic service has contributions from both the information system and the service literature, and both are related to benefits for companies, sometimes the measurement dimensions are overlapping. The authors in [22] proposed the quality of service, information quality and system quality constructs, whose measures of each of these dimensions are treated separately. Other authors, despite considering aspects of the system, information, services, treat these dimensions grouped in different formats [5, 32, 7]. To carry out the research, we selected the e-transqual model, among the reasons for choosing this model as a starting point for analyzing the quality dimensions of online retail, it is the important consideration of dimensions that represent the most hedonic aspects in the perception of quality.

4. The e-transqual measurement model

Supported by the transactional view of online shopping and with an orientation to the process, the e-transqual model seeks to measure the perception of quality in the electronic service and considers all its stages. Since affective and emotional reactions are important for the evaluation of the service, and understanding that fun is important for the characterization of a continuous user experience, in addition to utilitarian aspects (which consider more technical characteristics), related elements to hedonism in the user experience in relation to quality assessment in e-services [5]. Figure 1 presents a conceptual model that brings the five dimensions that represent quality perception on the online retails.

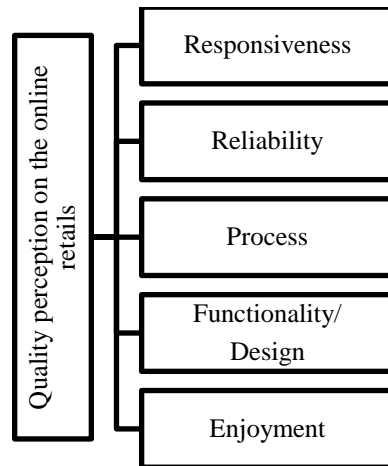


Figure 1: dimensions of measuring the perception of quality in electronic service

For the authors, these relationships of affection are crucial for the evaluation of e-services. Sensations of enjoyment and fun can provide a better experience of continuity, assuming that buyers' behaviors are not purely goal-driven, thus promoting a greater perception of value by users [33, 7]. The process-based transaction framework, that was applied as a foundation for proposing the model, could be understood in four stages. The first concerns the informational phase, whose consumers examine and compare existing offers on the market. The second stage concerns the agreement phase, related to the transaction conditions. In the third, there is the phase of compliance with the transaction, referring to its execution. Finally, in the fourth stage, building the relationship between customers and the company [5]. In terms of importance of fun in the internet shopping process, this feeling is a measure that provides greater acceptance for online shopping, providing reinforcement for e-commerce alone, going beyond its characteristics of performance [34]. The contribution of the e-transqual approach has a great relevance, considering it a universal quality framework in electronic service [11]. In this context, it can be seen in the literature the consideration of hedonic aspects being used to theoretically base hypotheses related to aspects of the website that influence loyalty, and the influence of fun for the purpose of repurchase, however in this last work the hypothesis was rejected [35, 7]. Among the dimensions proposed in the model, three of them are divided into subdimensions. The confidentiality dimension represents a sub-dimension related to the reliability of information. The Functionality dimension, on the other hand, presents a sub-dimension referring to the waiting time to access the website. Aesthetic design is a sub-dimension from Enjoyment that seeks to capture more subjective aspects of the perception of quality in online retail.

5. Research method

The research could be classified as exploratory of a quantitative nature, due to the interest in analyzing and discussing how the hedonic and utilitarian dimensions of quality are relevant to online retail and how they are organized. Therefore, there is no attempt to confirm the e-transqual model, nor to generalize the results obtained. We sought to relate possible variations between the results obtained and the original model with the theory about the theme, thus investigating the dynamics of the relationships between the variables. Exploratory research is interesting to better understand a research question, so that it is possible to identify perceptions, behaviors or needs, seeking more information and existing relationships regarding a given theme, without

necessarily proposing hypotheses [36, 37]. The strategy for data collection was the survey, so that the research instrument used was a questionnaire composed of 5 questions that sought to demonstrate characteristics of the sample profile and 25 measurement variables of the e-transqual model. All items were assessed using the same numeric scale ranging from 1="strongly disagree" to 5="strongly agree". To improve the reliability of the questionnaire, a content validation process was carried out through the analysis of the items by specialists in the areas of information systems, quality, and marketing. Validation by specialists was of fundamental importance in the process of constructing the questionnaire, since the original items referring to each of the quality attributes were in English language, thus allowing the attributes to be translated in a coherent way for understanding in Portuguese language. In addition, some attributes that presented doubts about meaning could be rewritten such a way as to benefit their understanding in each of the dimensions. In this research, which deals with the analysis of the dimensions of quality perceived by online retail customers, the population is understood to mean all citizens who made purchases at online retail companies. According to data from [4], about 58 million Brazilians bought over the internet in 2018. Regarding the research sample, it is classified as non-probabilistic for convenience. It is worth noting that this research does not intend to propose generalizations about the results obtained, the main limitation of non-probabilistic samples, and highlighting its exploratory character of quality dimensions, it is argued that such positioning still allows the results obtained to be relevant. Descriptive statistics techniques (mean and standard deviation) were used to analyze the sample profile. To analyze the variables of the e-transqual model, exploratory factor analysis (EFA) was applied. Its choice was therefore made, despite the adoption of a measurement scale for the elaboration of the data collection instrument, indicating a prior knowledge of the relationships between the existing dimensions, as it could be identified in the literature review, the dimensions that represent the quality of online service varies in both configuration and quantity. To perform the EFA, it is recommended that the sample size be between 5 and 20 times the number of variables to be analyzed [38]. Since the EFA was performed on a set of 25 variables, the sample size must be between 100 and 500 respondents. The sample is composed of respondents only from the Northeast region and had 345 valid responses (value within the suggested parameters). According to the [4], the Brazil Northeast region showed a 27% growth in the number of e-commerce orders in 2018, a growth that was higher than the country's average, which was 12%. The questionnaire was applied online, a link was created and disseminated through social networks so that the application process could be simplified. As for the treatment of the data, Cronbach's alpha was analyzed to attest the internal consistency of the measuring instrument, seeking to observe whether the items proposed to measure each dimension are indeed coherent. The Kayser-Meyer-Olkin Test (KMO) and the Bartlett Sphericity Test were employed to verify the suitability of the EFA. For Bartlett's Sphericity Test, a significance level of $p < 0.05$ is expected [38]. After checking the suitability of the method, the determination of the number of factors to retain was conducted, using Principal Component Analysis (PCA) as the extraction method that analyzes the total variance of the data to combine them into factors that may explain the greater amount of variance in the original variables [39, 40]. As a criterion for determining factors, the Kaiser test was taken into account, using the eigenvalue criterion, which assumes that a factor explains at least the variance of a variable present in the model, that is, the component it must have a eigenvalue, also called a latent root, greater than or equal to one. In order to facilitate the visualization of the variables in the extracted factors, the Varimax orthogonal rotation method was used. Communalities (suggested values: greater than 0.5) and factorial loads (suggested values: greater than 0.4) were analyzed to observe the adjustment of the items

grouped in their respective factors [38, 37, 39].

6. Results discussion

6.1. Sample profile

Among the 345 respondents, approximately 51.60% were women and 49.40% were men. Of the total respondents, 69.27% were between 18 and 29 years old; 21.16% between 30 and 44 years old; 6.66% between 45 and 59 years. There were few respondents younger than 18 years old (1.16%) and older than 60 years old (1.74%). Regarding education level, most respondents had incomplete higher education (34.49%) and post-graduate education (30.15%), respectively, followed by complete higher education (24.06%). Complete high school (8.40%), technical education (1.45%), incomplete high school (0.58%) (whose percentage is the same as those who did not have any of the levels of educational training present in the questionnaire) and education (0.28%) complete the information about the highest level of education of the respondents. When asked about making their last purchase online, most respondents (53.62%) had made purchases in the last 30 days; 24.06% had made purchases between 1 and 3 months; 8.7% between 3 and 6 months; 6.66% between 6 months and 1 year and 6.95% for more than one year. Table 1 shows means and standard deviations by dimension. The Reliability dimension presented the highest averages and the smallest standard deviations. The variable C3 (Accuracy of order delivery) obtained the highest average (4.88) and the lowest standard deviation (0.339) of the model. The higher averages attributed may be related to the fact that, in the environment of financial transactions, which is the case of online retail, the service's capacity as a whole to not present flaws is an extremely important element for the perception of quality [26, 41]. The technical character of the dimension can also justify the smallest standard deviations since customers judge the dimension in a more objective way, being able to present a perception of quality more similar between them [26, 41]. On the other hand, the variables H4, H2 and H3, which are part of the dimension Enjoyment (Hedonism), had the lowest averages, with 3.02, 3.06 and 3.61, respectively. This dimension also presented the largest standard deviations. The lower averages may be associated with the consideration that in the online shopping environment, hedonic aspects may not be as relevant as the technical aspects, since people may not realize the dimension of in an articulated way, but in a way intrinsic to the experience during the online shopping process [5]. Thus, ensuring the hedonic attributes of quality can be interpreted to inhibit dissatisfaction in the online shopping experience [5, 29]. Regarding the high values of standard deviations from this dimension, they may be related to the more subjective aspect of the hedonic quality attributes, so the dimension was perceived in a more heterogeneous way. Therefore, hedonic aspects are not consciously considered as determinants of quality for consumers at the time of purchase.

Table 1: Means and standard deviations by variables

Variables	Mean	Standard deviation
Responsiveness		
R1-Promptness of reactions to requests	4.20	0.862
R2-Return policy	4.46	0.792
R3-Availability of service personnel	3.68	0.916
R4-Availability of alternative communication channels	3.91	0.970
Reliability		
C1-Timeliness of order delivery	4.81	0.470
C2-Product availability	4.50	0.652
C3- Accuracy of order delivery	4.88	0.339
C4- Breadth and depth of product range	4.23	0.725
C5- Confidentiality	4.75	0.582
C6-Encoding of personal information	4.77	0.540
Process		
P1-Availability of the Web site	4.33	0.679
P2-Waiting time	4.17	0.828
P3-Stability of data Transmission	4.24	0.740
P4-Efficiency of online order processing	4.48	0.605
Functionality/design		
F1- Efficiency of navigation	4.32	0.667
F2- Clarity of the web site	4.48	0.600
F3- Accessibility of relevant content	4.17	0.805
F4- Relevance of information	4.32	0.720
F5- Timeliness of information	4.38	0.626
F6- Visual appeal	3.81	0.961
F7- Professional Web site design	3.95	0.876
Enjoyment		
H1- Personalization of information and offerings	3.70	0.913
H2- Fun of using the web site	3.06	1.079
H3- Excitement when shopping online	3.61	1.012
H4- Entertainment provided by the web site	3.02	1.078

6.2. Scale validation

Table 2 pointed that the instrument had a high internal consistency with the coefficient alpha value of 0.880 and demonstrating reliability of each dimension. Only the dimensions Responsiveness and Reliability showed a “moderate” association intensity. Values in the “moderate” association intensity range can be accepted, depending on the research objectives. It is also noteworthy that the highest alpha values are those of the Enjoyment and Functionality/ Design [38]. This finding confirms that the enjoyment issues represent the most

critical factor for assessing the perceived quality with online retailers.

Table 2: Exploratory factor analysis results for each dimension

Dimension	Number of variables	Cronbach’s alpha
Responsiveness	4	0.624
Reliability	6	0.690
Process	4	0.776
Functionality/design	7	0.811
Enjoyment	4	0.846
Instrument	25	0.880

At first, the empirical validation of the model was performed without excluding variables. The KMO test value was 0.858, which indicates an excellent suitability of the sample to perform the factor analysis. Bartlett's sphericity test also showed a level of significance within the desirable ($p < 0.001$). Subsequently, the Kaiser test were employed, the corresponding measures suggest a good fit of the extracted seven factors, representing an accumulated variance of 64.82%. However, some variables showed a factor loading in more than one of the dimensions, which may suggest the need to remove one or more variables to adjust the model. After successive alternative analysis of variable removal, it was decided to eliminate the variables F1 (Efficiency of navigation) and F2 (Clarity of the web site) and it resulted in a pool of 23 remaining quality indicators. The value of the KMO test remained in the range of “very good” adequacy, with a value of 0.848 and Bartlett's sphericity test remained with a significance level of 0.00. The Kaiser test indicated the loading of seven factors, which explain a slightly greater variance, corresponding to 66.66%. All communalities were within the desired value. Only variable C4 (Breadth and depth of product range) had a factor load in more than one factor. However, as the biggest factor load is in the dimension that it composes, it was decided to keep it. Table 3 shows the information exposed. Analyzing the model, the EFA result shows that the result kept the structure of e-transqual practically the same, corroborating the relevance of the theoretical relations established therein. Regarding the exclusion of the variable F1 (ease of navigation), understood by many authors as synonymous with usability, ease of navigation, or ease of use, it is an attribute derived from the Technological Acceptance Model and it is used as a relevant dimension for the perception of quality by several authors [32, 42, 8]. The removal of the item was important for the better adherence of the variables in their respective factors, so that their exclusion may be related to a possible duality between what seeks to measure the variable in isolation and what the entire dimension Functionality seeks to measure, that is, the item Ease of navigation was redundant. In other words, the dimension seeks to measure accessibility, availability, and relevance of information, which is understood in some works as the concept of ease of use or usability [8, 41, 43].

The Enjoyment dimension (Hedonism) presented high factor loads, which supports the need to consider attributes related to fun and pleasure when measuring quality in online retail, since customers do not make decisions solely oriented to objectives, that is, purely utilitarian [44, 45]. In this perspective, in the proposition of the e-transqual measurement model, the formation of the perception of quality in online retail is also supported by the hedonic view, influenced by the dimension of Functionality and Design and by feeling of

pleasure during the purchase process at the online retailer [5].

Table 3: Factor loadings results for 23 items of the model

Variables	Factor1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
R1					.737		
R2					.759		
R3					.471		
R4					.593		
C1				.666			
C2				.650			
C3				.708			
C4	.455			.497			
C5						.914	
C6						.881	
P1		.708					
P2		.778					
P3		.710					
P4		.564					
F3			.654				
F4			.818				
F5			.809				
F6							.732
F7							.816
H1	.641						
H2	.843						
H3	.812						
H4	.818						

Thus, the proposed model was adapted to the reality studied and simplified so that it can be used with a smaller number of variables when compared to the original e-transqual model, in order to provide conditions for companies operating in the online commerce environment to use this instrument. data collection to be able to search for information about the perception of quality of its customers.

7. Conclusion

With the removal of the aforementioned items, the aim was to improve the model e-transqual and the differences found are simple, however, some adjustments are supported by theoretical considerations that better justify the results obtained. It is worth noting that this does not mean that these considerations are the only ones that can be admitted. In this way, understanding how the dimensions of quality are organized allows the most important elements of analysis to be perceived for the perception of quality in online retail. Online retail companies must focus on the technical characteristics of the service, information and system, but they must not neglect the hedonic aspects of quality, so that they can make the customer experience during the purchase process more pleasant and thus ensure higher levels of quality perception. In view of the results obtained and informed by insights from extant literature regarding quality in the online environment, some topics are suggested for further research. As a starting point for such research, an consideration that the dimensions may vary depending on the type of electronic service, it is suggested to apply the structure resulting from this research (and adaptations, if pertinent) in other types of electronic commerce such as B2B and C2C, since in this modality online sellers present themselves on a single website, and with that there are no differences between

aesthetics and technical aspects of the website. Since the research did not aim to confirm the e-transqual model, but rather to analyze its structure of dimensions, confirmatory analyzes were not carried out. In this sense, after carrying out this exploratory research it would be pertinent to carry out the Confirmatory Factor Analysis (CFA) in another sample, so that it was possible to confirm the model resulting from this research or propose improvements in it, contributing to the construction of the dimensions field quality in the online environment. Since the work consists of an opinion poll, its results are changeable, therefore, when considering a new sample, it is not possible to ensure the same results obtained here.

8. Recommendation

Since this study had its result obtained from the customer's perspective, it is suggested to apply the model obtained from online retail professionals and web systems developers, in order to counter the perceptions regarding the dimensions and attributes of quality. It is also recommended to collect more respondents from other regions and thereby compare the results obtained. It is also added that it would be possible to apply questions related to benefits arising from the perception of quality in the electronic service and thus perform some hypothesis tests to verify the association of dimensions with benefits related to the perception of quality, such as purchase intention and customer loyalty. Finally, it is also suggested to carry out qualitative research for a detailed analysis of each attribute identified as relevant to the composition of quality dimensions. Focus group techniques and content analysis can be used together to identify relevant attributes from the perspective of systems and information and / or marketing professionals.

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