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An fsQCA analysis of service quality for hotel customer satisfaction

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ABSTRACT

Managing customer satisfaction (CS) by adapting to market changes is essential for achieving customer loyalty. This study analyzes the asymmetric relationship between service quality (SQ) and CS in the hotel sector by applying the fuzzy-set qualitative comparative analysis (fsQCA) method to a five-star hotel in Cuba. Results of customer SQ perception analysis as configurations of conditions that explain the outcome of CS identify the individual contribution made by each of the services. In this specific case, when combined with other conditions in three different configurations, the quality of food in specialized restaurants is shown to be the determinant of the studied hotel's CS outcomes. This research shows that fsQCA is useful for managing the causal complexity of hotel processes and activities. Additionally, it helps managers optimize CS by determining which attributes they need to focus on and which they do not, thus responding to the need to determine how SQ dimensions influence CS.

1. Introduction

As key economic actors in the tourist sector, hotels had to face up to the challenge of adapting to the new conditions triggered by the COVID-19 pandemic. However, although this unprecedented crisis had an extremely serious effect on the tourism industry (Bonfanti et al., 2021), it also generated an opportunity for innovation and technological changes (Sigala, 2020) to satisfy consumers' changing needs (Hu et al., 2021) and modernize service standards (Chan et al., 2021).

Today's hospitality industry customers are characterized by being demanding, sophisticated, and time-strapped (Ali et al., 2021). This highlights how important it is for hotel managers to ensure that that they provide top-quality service and understand how customers perceive value (Zeithaml, 1988) to minimize any possible shortcomings (Cheng et al., 2018). Choosing a product or specific market segment strategy based on an understanding of customer attribute value (Zeithaml, 1988) means that, to improve competitiveness and efficiency, customer perceived value must be measured and hotel industry processes and activities must be managed with an effective tool such as *Lean Management* (Perdomo-Verdecia et al., 2022).

Customers' perceived value is based on their customer service experience and influences their satisfaction (El-Adly, 2019). In the case of hotels, customer satisfaction (CS) is mainly determined by service quality (SQ) (Song et al., 2022). So, as stated by Badarch and Zanabar (2017), SQ's impact on CS is a key factor for a hotel's success. In addition, as the factors that influence CS are constantly changing (Song et al., 2022), it is important to monitor CS trends through customer feedback and subsequently make changes to improve SQ. Therefore, effective indicators must be used to assess SQ to enable managers to make decisions that make their hotels competitive (Nunkoo et al., 2020).

However, Oh and Kim (2017) highlighted that basic theoretical construction research is still needed to define and identify specific SQ conditions in the hotel sector and that, although it is still useful to apply the adopted models, additional rigor needs to be developed in research practice to afford the discipline a more recognized scientific status. Indeed, despite abundant CS research, the complexities of the nonlinear relationship with SQ attributes remain largely unexplored. In this regard, academics and practitioners agree that investing equally in all service attributes to increase satisfaction is ineffective and does not justify additional investments. For example, a lack of hygiene in a hotel room may generate serious dissatisfaction but a clean room will not trigger satisfaction to the same degree. A complimentary chocolate may produce high satisfaction but, when not offered, it will not affect CS negatively (Slevitch and Oh, 2010). Although research exists on asymmetric relationships in other sectors and areas (Ju et al., 2019; Pappas et al., 2020; Sukhov et al., 2021; Farmaki et al., 2022; Cifci et al., 2023a, 2023b; Kahraman et al., 2023), some authors emphasize the need to expand theoretical and empirical knowledge of these types of

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relationships, especially in the hotel sector (Kim et al., 2023a, 2023b).

Knowledge is required of the most recognized evaluation concepts and models to identify and measure SQ. The models proposed by Grönroos (1982), (1984) and Parasuraman et al. (1985) have prompted discussions and debates involving different types of services. The Grönroos model (1982, 1984) entails the integration of general attributes that determine SQ perception. Meanwhile, the well-developed Parasuraman et al. (1985), (1988) SERVQUAL model proposes that SQ can be assessed through five quality dimensions: tangibility, reliability, responsiveness, empathy, and assurance, and these have been used in numerous investigations in the hotel sector (e.g., Jasinskas et al., 2016; Ali et al., 2017; Ahmad et al., 2018; Shafiq et al., 2019).

Notwithstanding, in the scientific literature, there is a lack of consensus as to which dimensions directly impact CS (Marković and Raspor Janković, 2013; Minh et al., 2015; Ali et al., 2017; Badarch and Zanabar, 2017). In 2006, Akbaba (2006) argued that although the SERVQUAL scale was a very useful tool as a concept, it needed to be adapted to the specific service segment and the cultural context in which it was used. Along the same lines, both before (Luk and Layton, 2004) and after (Park et al., 2021), other authors also recommended making modifications to the original SERVQUAL scale to adapt it to the specific characteristics of each service's attributes. Furthermore, changes in business environments and the specific components of hotel sector SQ need to be taken into account (Ahmad et al., 2018; Uslu and Eren, 2020). This implies recognizing that the factors that influence CS could vary depending on the context and the specific characteristics of the service that the hotel offers, which is, really, multiple services combined into one. Given that SQ attributes may affect CS differently and that research on the impact of situational factors on the asymmetric relationship between attribute-level performance and CS is still limited in the area of hospitality (Kim et al., 2023b), adopting complementary research methods may mitigate these weaknesses and allow stronger empirical evidence to be obtained with internal and external validity (Kim et al., 2023a).

This research seeks to contribute to addressing this gap by going beyond the "all or nothing" association presented by traditional statistical models and, specifically, inquiring into how certain combinations of some perceived quality conditions can compensate for the absence of others to optimize customer satisfaction. Consequently, the research question is posed in the following terms: RQ: What combinations of the hotel's SQ aspects produce customer satisfaction? Thus, the purpose of this research is to determine how hotels can identify the combinations of SQ conditions that produce the best CS outcomes. For this, a Fuzzy Set Qualitative Comparative Analysis (fsQCA) has been applied to a case study to identify the individual contributions of a variety of hotel services to CS and enable future identification of the SERVQUAL model's SQ dimensions.

An exploratory study with fsQCA is presented to assess the integrated behavior of SQ and the effect on CS in the hotel sector. Many researchers in the hotel sector recognize that the fsQCA method allows complex interactions to be modeled by assuming the proximity and asymmetry between independent and dependent variables, where configurations of the variables determine the results (Cifci et al., 2023a). This configurational proposition is based on causal complexity characterized by three characteristics (Harms et al., 2021): conjunction (the results depend on how several conditions are combined), equifinality (there may be more than one way to achieve the same outcome), and asymmetry (attributes that are effective in one configuration could be less effective or ineffective in another.)

To the best of the authors' knowledge, no study exists that proposes to optimize CS in the hotel sector with a holistic and asymmetric approach and a configural evaluation of SQ perception. The results of this study's fsQCA analysis not only show what alternatives managers can implement to achieve the best results but also how to reduce costs by helping companies identify the attributes that do not need to be acted upon or reinforced to achieve customer satisfaction. The analysis is based on data collected through a survey of hotel guests with SQ perceptions taken as the explanatory conditions of their satisfaction level. The use of a configurational focus and fsQCA provides a fuller and more detailed perspective that contributes to the current understanding of how the different combinations of SQ conditions could influence CS in the hotel context.

2. Analysis of hotel service quality and customer satisfaction

Measuring and assessing SQ's impact on CS have been recurring topics for both academics and professionals in a range of service industries, including the tourism and hotel industries (Minh et al., 2015). In this context, the consideration of SQ from the customer perspective has been recognized as one of the most important factors that determine the success of tourist and hotel businesses.

Effective SQ management is considered to be a core component of a company's marketing strategy and its successful implementation begins with the accurate and reliable measurement of SQ. This enables the company to identify the key quality dimensions that need to be improved (Luk and Layton, 2004). Furthermore, SQ, which reflects the customer's perception of the service component of a product, plays a critical role in CS (Zeithaml et al., 2018, p. 104).

Different definitions of CS can be found in the literature. Oliver (1980), (1999) defined CS as the feeling of pleasure that customers experience when comparing the outcomes of consumption with their expectations. Perceived SQ refers to a global judgment of a service's superiority, whereas CS refers to a specific transaction and the emotional reaction that comes from evaluating perceived performance compared to the customer's expectations based on an ample set of interactions (Hu et al., 2009).

According to Wirtz and Lovelock (2021), CS is determined by acquired experience, with the assessment of the feeling of pleasure or disappointment that people experience when they compare the perceived outcomes with their expectations. In the context of the hotel sector, El-Adly (2019) conceptualized CS as a unidimensional construct that reflects a guest's general impression and is made up of all the interactions and encounters with the hotel's performance over time. This simplified vision of CS as a unidimensional construct can have practical benefits as it makes measurement less complex for analysis and it can be captured through a single measure or factor that represents a general assessment of the customer experience.

So, the integration of CS and SQ is considered essential for understanding a service organization's performance (Oh and Kim, 2017) and SQ's impact on CS is recognized as a key factor for hotel success (Badarch and Zanabar, 2017). According to Sánchez-Rebull et al. (2018), both SQ and emotions play crucial roles as antecedents to CS, and, in turn, CS has consequences for customer loyalty. Thus, CS management should be considered essential for a hotel's sustainability and growth (Lee and How, 2019) and is particularly important for management to have a detailed understanding of guests' perceptions and motivations to be able to plan and execute services effectively (Lu et al., 2015). Recognizing SQ's importance for strengthening the business and competing in the market (Akbaba, 2006) demands an exploration of the literature to identify the measurement instruments developed to evaluate both SQ and CS.

Researchers usually adopt two main conceptual focuses to measure SQ: the Nordic perspective (Grönroos, 1982, 1984) and the US perspective (Parasuraman et al., 1988). Both currents of knowledge offer valuable focuses for understanding different aspects of the customer experience, although neither encompasses the SQ construct entirely. The Nordic School uses general categorical terms to define SQ, whereas the US School uses descriptive terms (Prakash and Mohanty, 2013). For Grönroos (1982), (1984), SQ is achieved by integrating the total quality of three main dimensions: technical quality (what is offered), functional quality (how it is offered), and corporate image (how the brand is perceived), and includes all the attributes that could influence or affect

service perception.

Meanwhile, Parasuraman et al. (1985) proposed the SERVQUAL model, which can be applied to a broad range of services, based on the idea that SQ perception is determined by the gap between the customer's expectations and real performance. This original study identified ten dimensions of SQ: tangibles, reliability, responsiveness, communication, credibility, security, competence, customer understanding-knowledge, courtesy, and access. However, Parasuraman et al. (1988) subsequently reduced the ten original dimensions to five:

1) Tangibles: the appearance of physical installations, and the service team and personnel.
2) Reliability: the ability to provide the promised service effectively and accurately.
3) Responsiveness: implies a willingness to assist customers and provide rapid service.
4) Empathy: implies offering customers individualized service and care.
5) Assurance: employees' knowledge and courtesy and their ability to generate confidence.

Despite criticisms of the SERVQUAL model and suggestions for additional modifications to the model, it was used as an initial framework in the service sector and adapted to improve its applicability and relevance to a variety of contexts. It has been applied in different types of organizations such as banks, retail outlets, and tourism (Hamzah et al., 2017). However, the SERVQUAL measurement model has been said to focus on the elements of the processes and the functional part of SQ without adequately addressing the dimension of the SQ outcome, i.e., the end effects or impacts that SQ has on CS (Luk and Layton, 2004).

SERVPERF is an alternative model proposed by Cronin and Taylor (1992) that measures service quality by consumer perception. A subsequent proposal was considered by Luk and Layton (2004), who used performance metrics to assess SQ instead of the SERVQUAL model gap scores. This modification aimed to increase the practical value of the information that was obtained. The use of performance scores avoids the need to compare expectations with real performance, which simplifies the measurement process and makes it easier to interpret the results. Luk and Layton, (2004) specifically adapted the SERVQUAL model to measure SQ in the context of hotel room services. Their goal was to improve the utility of the information by considering the individual contributions that the different quality dimensions make to customers' perceptions of the general service quality.

SERVQUAL has also been used in the hotel industry to identify the SQ dimensions that need to be focused on to improve a hotel's market position and offer better service to its guests (Shafiq et al., 2019). Table 1 lists some of these studies and their main results or conclusions.

These studies presented different perspectives of the SQ-CS relationship in hotels. For example, Jasinskas et al. (2016) stated the influence of customer nationality, while Lu et al. (2015) related CS to perceived value according to the cost of lodging, and Nunkoo et al. (2020) found differences depending on the hotel category. However, there was no consensus on the SQ dimensions that impacted hotel CS (Albacete-Saez et al., 2007). Table 2 illustrates this.

Although SQ dimensions have been established to be significantly and positively correlated with CS (Marković and Raspor Janković, 2013; Azhani et al., 2017; Ali et al., 2021), contextual differences can reveal some specific effects of the quality dimensions on CS in the hotel sector. It is important to highlight that the tangibles quality dimension has been seen to have more positive results (Suki, 2014; Ahmad et al., 2018; Bakirtzoglou et al., 2018; Shafiq et al., 2019), but some cases have also been found where it does not have any significant effect (Dedeoğlu and Demirer, 2015; Hu et al., 2019).

Research studies such as Chen et al. (2021) and Park et al. (2021) have highlighted that the SERVQUAL model dimensions can vary depending on the type of service and the context in which it is applied. The need to adapt the model to the specific requirements of each sector,

Table 1
SERVQUAL model applied to the hotel sector.

REFERENCES	MAIN RESULTS
Suki (2014)	Empathy and tangibles were the most important predictors of male tourist satisfaction compared to female tourists.
Dedeoğlu and Demirer (2015)	The tangible dimension offered the lowest explanation of service quality measurement compared to intangible dimensions.
Lu et al. (2015)	Managers measured satisfaction in 5-star hotels in Taiwan by services offered, and the guests conceptualized satisfaction as the value received for the price of their accommodation.
Jasinskas et al. (2016)	Quality evaluation with the criteria of communication and reliability was higher for customers who lived in Lithuania than for customers from other countries.
Umasuthan et al. (2017)	Evaluation of the comparative influence on hotel guests' emotional service experience and behavioral intention of two dimensions of empathy (cognitive and emotional attributes) as a subscale in the SERVQUAL instrument.
Ahmad et al. (2018)	Results indicated that three of the five SERVQUAL dimensions, namely tangibles, responsiveness, and assurance, have a significant positive impact on visitor satisfaction in the small- and medium-sized hotel industry. The impact of the other two SERVQUAL dimensions, reliability, and empathy, on visitor satisfaction was not significant.
Bakirtzoglou et al. (2018)	The most important dimensions in Spa hotels in Greece were the human dimensions (responsiveness and reliability) and the setting (tangibles).
Kumarasinghe et al. (2019)	The study of local and foreign guests at 5-star hotels in Sri Lanka discovered that local visitors were less satisfied with the hotel service security dimension, whereas foreign visitors were less satisfied with the empathy dimension.
Shafiq et al. (2019)	The tangibility, reliability, security, and empathy dimensions were more important for satisfaction.
Nunkoo et al. (2020)	Identified specific patterns for South African hotel categories: for 1- and 2-star hotels, the most important predictors were the accommodation infrastructure and the employee experience; for 3-star establishments, they were security and room quality, and for 4- and 5-star accommodation, waiting time and customer interaction.
Park et al. (2022)	Indicated that reliability, competency, efficiency, and leisure activities positively influenced customer satisfaction.
Sangpikul (2022a)	Presented three main findings: 1) hotel assurance can be identified in the hotel's main service areas; 2) assurance can be conceptualized in four key categories: food and beverage assurance, personnel assurance, physical assurance, and process assurance; 3) during the COVID-19 pandemic, perceived hygiene was integrated into the assurance dimension.
Sangpikul (2022b)	Assurance was the most frequently quoted SQ dimension in the resort setting, followed by empathy, responsiveness, tangibles, and reliability.

Table 2
Effects of quality dimensions on CS in the hotel sector.

	EFFECTS ON CS	
QUALITY DIMENSIONS	Positive effects	No effects
Tangibles	Suki (2014); Ahmad et al. (2018); Bakirtzoglou et al. (2018); Shafiq et al. (2019)	Dedeoğlu, and Demirer (2015); Hu et al. (2019)
Reliability	Bakirtzoglou et al. (2018); Shafiq et al. (2019); Park et al. (2022)	Ahmad et al. (2018)
Responsiveness	Ahmad et al. (2018); Bakirtzoglou et al. (2018)	
Empathy	Suki (2014); Umasuthan et al. (2017); Shafiq et al. (2019)	Ahmad et al. (2018)
Assurance	Ahmad et al. (2018); Shafiq et al. (2019)	

country, or culture has been recognized and represents an opportunity to contribute to the literature on SQ (Ahmad et al., 2018).

According to Grönroos (1984), it is plausible that quality perception begins with customers' evaluations of SQ when they compare their expectations with the received service. However, for Mukherjee (2019), expectations are not necessarily consistent or predictable and are influenced by the management's communications and advertising. In other respects, despite recognizing the importance of expectations, Cronin and Taylor (1994) stated that it was challenging to measure SQ as the difference between performance and expectations; expectations should be noted before the service encounter, otherwise they can be influenced by the perceptions of the real service that is received. In addition, there are practical limitations to measuring expectations before the service encounter, and this will depend on the circumstances in which the measurements are taken. As Table 3 shows, other researchers have opted to propose specific models to determine the SQ dimensions that influence CS in the hotel sector.

As can be observed, Knutson et al. (1990) measured SQ expectations and found that reliability and assurance were very important aspects for CS. Meanwhile, Getty and Thompson (1994) described a process to develop an SQ perception scale that differentiates between tangible and intangible dimensions. Mei et al. (1999) extended the SERVQUAL model with the inclusion of the "employees" dimension as the best predictor of SQ. Lastly, Wu and Ko (2013) considered SQ an umbrella dimension that includes the quality of the interaction, the setting, and the results.

The limitations of these SERVQUAL model adaptations can be found in research by Zeithaml (1988), who indicated that customer perceptions of SQ change over time due to factors such as information, competence, and expectations being constantly in flux. Despite advances in the measurement and understanding of the SQ dimensions in the past three decades (Chen et al., 2021), the dynamic nature of SQ suggests the need to constantly evaluate customer perception and make adjustments to service on this basis (Zeithaml, 1988; Nunkoo et al., 2020).

Table 3
SQ management model adaptations in the hotel sector.

REFERENCE	MODEL	FOUNDATIONS	RESULTS
Knutson et al. (1990)	LODGSERV	An index of 26 items designed to measure SQ expectations in the hotel experience using the five generic SQ dimensions: Tangibles, Reliability, Responsiveness, Empathy, and Assurance.	People have high expectations of reliability and assurance and will not be satisfied with their mere presence. However, they will be dissatisfied if they are absent.
Getty and Thompson (1994)	LODGING	Based on separating the tangible quality dimensions from the intangible quality dimensions.	Describes a process to generate a quality perception scale that can be adapted to the needs of the lodging industry.
Mei et al. (1999)	HOLSERV	Examines SQ dimensions in the hospitality industry by expanding the SERVQUAL model with eight new items.	SQ is represented by three dimensions in the hotel industry related to employees (behavior and appearance), tangibles, and reliability. The best predictors of general service quality are the dimensions referred to as "employees".
Wu and Ko (2013)	SSQH	Proposes a multidimensional and top-down service quality model for the hotel industry: the Scale of Service Quality in Hotels (SSQH)	Considers SQ to be a global dimension comprising three main dimensions: interaction quality, environmental quality, and outcome quality.

One of the most important weaknesses of these models is that they have to consider that the hotel industry encompasses several departments and that customer perception is influenced by the main service areas of the hotel such as reception, food and beverages, and rooms (Sangpikul, 2022b). Hotel guests usually base their primary evaluation on the consumption outcome, and their knowledge of the service may be too limited to form realistic expectations (Luk and Layton, 2004). If the main service areas are considered to influence customer perception of hotels, a configurational analysis would identify how combinations of customer perceptions of each of these services impact hotel CS. This would allow service resource allocation to be optimized according to the importance of the different service stages for CS (Xie and Sun, 2021).

The above reveals the importance of applying complexity theory to obtain more theoretical information. Several works have attempted this by investigating the asymmetric effects of service attributes on customer satisfaction with hotels. For example, the Kano model, also known as the three-factor theory, differentiates between three main kinds of service attributes: basic (must-be), performance (one-dimensional), and excitement (attractive or delighters) (Albayrak, 2019). The absence of basic attributes leaves customers dissatisfied yet their presence does not create satisfaction as customers regard them as the minimum features that a product must have. However, although excitement attributes trigger greater satisfaction, when they are missing, customers are not dissatisfied as they did not expect them. Consequently, their presence is gratifying. Basic and excitement attributes, therefore, have asymmetric effects on customer satisfaction. As for performance attributes, a high level may result in a high level of satisfaction and a low level of performance in a high level of dissatisfaction.

Some research has been developed on asymmetric relationships based on the Kano model, which classifies the different attributes (or QS perceptions) as one of the three above-mentioned attributes. Deng et al. (2008) presented a revised importance-performance analysis (IPA) that integrated three-factor theory and benchmarking with partial correlation analysis. Albayrak (2019) used multiple regression analysis to identify the critical factors that generated customer satisfaction in light of the performance of the competition. Li et al. (2020) extracted 412,784 consumer-generated reviews of different cities in China from TripAdvisor and identified how the classification of hotel attributes (basic, performance, or excitement) differed according to hotel star ratings and customer segments. However, these studies on asymmetric effects focused on the three-factor theory did not capture the complexity of the links between SQ and CS as they did not consider the different configurational relationships that could influence the individual contributions of hotel services.

Therefore, additional exploration is required to adequately capture the quality dimensions, and for this, it is essential to identify and understand customer perception in key areas of hotel service. This research proposes an integrating vision and the use of the fsQCA method to explain CS (Alnawas and Hemsley-Brown, 2019) while not only recognizing that SQ can vary according to the business setting but also that it can impact customers' perceived value, image of the company, satisfaction, and purchasing intention (Palazzo et al., 2021). Some recent studies (Pappas et al. 2020 on social networks; Sukhov et al. 2021 on public transport; Farmaki et al. 2022 on job satisfaction) have applied similar perspectives in other sectors but did not cover the research gap in the hotel sector. As indicated in the Introduction Section, the purpose of this research is to determine how hotels can identify the combinations of SQ conditions that produce the best CS outcomes, for which the fsQCA analysis is applied. This would enable managers to better understand customers' value preferences and to ensure satisfaction by focusing on improving the performance of the processes that deliver said value elements.

3. Methodology

An integral evaluation was carried out to examine how SQ perception of different hotel services affects CS. A case study of a specific hotel was used to address the gap found in this research area. A configurational focus (QCA) with fsQCA software version 4.1 was used for this assessment. This focus is based on Boolean set theory and algebra, which are widely applied in the social sciences, and combines some of the strengths of both qualitative and quantitative research methods (Marx et al., 2014).

An evaluation has been performed of customer SQ perceptions of hotel service areas that impact CS. The data used to assess SQ and CS were obtained through surveys administered in a 5-star hotel in Santiago de Cuba (Cuba) with employment ties to one of the authors. These surveys were focused on collecting customer perceptions of a variety of specific services such as reception, rooms, restaurant buffets, specialized restaurants, bars, and cleanliness. CS was measured using an independent scale element in the questionnaire that evaluated the general impression of the hotel's performance (El-Adly, 2019) considered as the feeling of pleasure that customers experience when comparing the outcomes with their expectations (Oliver, 1980,1999).

The survey, which contained questions about the quality perception of the different hotel services, was previously developed and validated by the hotel brand management. The population under study comprised 358,809 customers staying at the hotel over a seven-year period. The sample was 30,769 customers, which guaranteed a 3 percent error level. A 5-point Likert scale ranging from "strongly disagree" (1) to "fully agree" (5) was used. The results were collected as a central tendency measure for each month using the arithmetic mean to enable an fsQCA analysis of all the available information for six SQ and CS conditions over a period of 7 years. The final data were the results of the arithmetic means of the most representative months of highest and lowest hotel occupancy. As hotel occupancy seasonality is closely linked to the market segments addressed by hotels, changes to the guest profile are directly reflected in the monthly occupancy patterns (Mitra, 2020). Increasing occupancy levels during low season is a major marketing challenge for most hotels and one effective strategy could be to add value to the product during this period to stimulate demand (Jeffrey and Barden, 2001).

Given the above, this research has been focused on the three months of highest occupancy (January, February, and November) and the three months of lowest occupancy (September, October, and May) in each of the seven years. This yielded 42 cases with 6 SQ conditions, one result (CS), and 294 observations. The SQ conditions selected in line with the interests of the hotel were: Reception Speed and Efficiency (RSE), Room Comfort (RC), Buffet Food Quality (BFQ), Specialized Restaurant Food Quality (RFQ), Bar Beverage Quality (BBQ), and Room Cleanliness (RCL). The outcome (CS) was simultaneously assessed in the survey as Satisfaction for Price Paid (SPP). Fig. 1 shows the process followed.

The first step in fsQCA is to convert the dataset into a fuzzy set. The purpose of this is to obtain the measures in membership scores that range between zero and one so that they comply with known standards and can be interpreted (Ragin, 2008). Statistical normalization (Krylovas et al., 2018; Prostov et al., 2015) was used for this with the following expression:

$$X_{i'} = (X_i - X_{\min})/(X_{\max} - X_{\min})$$

where X is the value to be normalized and X_{min} and X_{max} are the minimum and maximum values of the data already averaged.

The dataset membership scores must be regarded as simply the transformation of interval scales into degrees of membership in the target set. Fuzzy sets can be calibrated using direct method criteria by specifying the values of an interval scale with three qualitative cut points: full membership, no membership, and cross point, which are 0.95, 0.05, and 0.50, respectively (Ragin, 2008).

As cases with an exact value of 0.5 make it difficult to analyze the conditions established at this point (Ragin, 2008), this research has considered the Fiss suggestion (2011) that a constant of 0.001 should be added after calibrating the causal conditions below full membership scores of 1.

One important difference between the configurational comparative methods and conventional qualitative methods is that the result focuses on causal recipes. The language used does not focus on dependent and independent variables but on conditions and results, with the understanding that it is the interactions between these variables, referred to as configurations, that cause the outcome of interest and not their isolated impacts (Medina et al., 2017; Gannon et al., 2019). The challenge of configurational thinking is to see the causal conditions as possible collaborators in producing the results. It is not simply a question of which variable is the strongest, but rather, how the different conditions combine and whether there is only one combination of conditions or several different combinations that are capable of generating the same outcome (Woodside, 2017).

Fuzzy set qualitative comparative analysis (fsQCA) identifies one or more causal configurations that lead to the confirmation or negation (presence or absence) of the outcome. Thus, fsQCA captures equifinality, i.e., that the same outcome can be achieved with several different combinations of causal conditions (Ragin, 2008; Fiss, 2011). This method addresses the flaw in the majority of traditional methods that suppose that causal conditions are "independent" constructions and that the impact on the outcome variable is both additive and linear (Valaei et al., 2019).

Joint use of fsQCA and research on the dominant service logic is useful for advancing theory and practice in services research (Wu et al., 2014). As it is an appropriate focus for analyzing a complex configuration (Ragin, 2000), fsQCA overcomes the issue with other techniques that envisage estimation of the separate, unique, and net effects of each variable caused by their focus on causal complexity, where cases are understood as a specific combination of interacting factors that produce a given outcome of interest (Medina et al., 2017).

This study identifies SQ variables (causal conditions) that are combined to produce alternative paths (configurations) to achieve a similar CS solution (outcome) and proposes a different research paradigm that includes configurational-focused case-outcome theory construction (Pappas and Woodside, 2021).

The fsQCA method offers two types of configurations that include necessary and sufficient conditions. These configurations can be marked by their presence, absence, or the "do not care" condition. The ideas of necessary and sufficient can offer more sophisticated and detailed analyses of the causal relationships and their nature in each case, which are difficult to capture with normal statistical techniques.

An fsQCA analysis begins by verifying whether any of the causal conditions can be considered necessary for the outcome or the absence of the outcome (Medina et al., 2017). A causal condition is considered necessary when it is always present (or absent) when the outcome is present (or absent) (Rihoux and Ragin, 2009). The scientific community

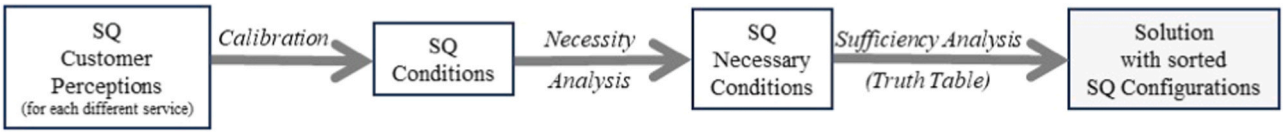

Fig. 1. Fuzzy Set Qualitative Comparative Analysis (fsQCA) Methodology.

takes consistency values of between 0.85 and 0.95 as their reference for the necessary condition analysis (Medina et al., 2017) and Greckhamer et al. (2018) specifically recommended a consistency reference point of at least >0.90 and also a high-coverage measurement to indicate an empirically relevant requirement. Consistency refers to the ratio to all the cases with X of cases with condition X where outcome Y is also found. In contrast, coverage shows the ratio to all the cases with Y of cases with Y where X is also present (Ragin, 2006).

In sufficiency analysis, Boolean minimization is used as a tool to identify conditions whose presence or absence is not important for producing a certain outcome. The inclusion of a truth table identifies all the possible combinations that address the limited diversity of empirical data (Medina et al., 2017). The truth table has to be optimized by frequency and consistency (Ragin, 2008). Frequency is the number of observations for each possible combination to establish a cut-off point and guarantee the minimum number of empirical observations.

4. Results and discussion

Before delving into the two stages of the fsQCA analysis (see Fig. 1), which are covered in the following subsections, note that the table with the values of the conditions and the outcome normalized and calibrated using the direct attribution method can be found in the Appendix.

4.1. Necessary conditions analysis

The necessary conditions analyzed with fsQCA software version 3.0 were tabulated with the consistency and coverage values of the different conditions and the outcomes for the present and absent (indicated with ~) states (Table 4).

The obtained results allowed an evaluation of the explanatory conditions based on consistency and coverage values. The necessary condition is highlighted in Table 5 (in gray), considering a consistency threshold greater than 0.90 (Greckhamer et al., 2018).

Only the RFQ condition met the necessary consistency value for the SPP result. For the analysis of the absence of the result (~SPP), none of the conditions were considered necessary. Coverage analysis revealed the proportion of cases in which both the condition and the outcome of interest appeared among those exhibiting the same condition. The RFQ condition was present in 71 percent of cases with the desired SPP result.

4.2. Sufficiency analysis

Analysis of the truth table examines the cases that share specific combinations of conditions and assesses whether these cases lead to the same outcome (Ragin, 2008) to identify the configurations that can be considered sufficient conditions. Rows in Table 5 show configurations that correspond to one or more cases (the *number* column indicates the number of cases) and also have a consistency threshold of 0.85 (raw consistency). This is the threshold that some research (Ragin, 2008, p.136; Medina et al., 2017, p.137) considers a sufficient configuration to produce the outcome of interest.

Table 4
Results of necessary conditions analysis for SPP and ~SPP.

	Presence (SPP)		Absence (~SPP)	
	Consistency	Coverage	Consistency	Coverage
RSE	0.759	0.817	0.605	0.601
~RSE	0.630	0.634	0.815	0.757
RC	0.797	0.827	0.592	0.567
~RC	0.584	0.608	0.820	0.788
BFQ	0.851	0.744	0.679	0.547
~BFQ	0.589	0.667	0.683	0.809
RFQ	0.913	0.710	0.774	0.555
~RFQ	0.429	0.673	0.597	0.863
BBQ	0.794	0.765	0.680	0.604
~BBQ	0.589	0.666	0.735	0.767
RCL	0.656	0.669	0.617	0.580
~RCL	0.587	0.625	0.647	0.634

The first 6 columns show the presence or absence of each condition; a value of 1 indicates a high level of the condition and 0 is a low level of the condition. Only the configurations of conditions with PRI values above 0.5 (highlighted in gray) have been taken into account to avoid any significant inconsistency (Greckhamer et al., 2018). These PRI values refer to simultaneous relationships of configuration subsets both in the outcome and the absence of the outcome (Pappas and Woodside, 2021). Consequently, configurations were encoded (SPP and ~SPP columns) distinguishing between consistent configurations (1) and inconsistent configurations (0).

When performing minimization, only configurations containing empirical information have been taken into account. The minimization of truth tables yielded three solutions: complex, parsimonious, and intermediate. Table 6 shows the different configurations that give the three solutions.

The complex solution achieved high consistency (0.842) and included service combinations for the desired SPP result. The ~RSE*RC*~BFQ*RFQ*~BBQ*~RCL configuration had exceptional consistency (0.954) but lower coverage (0.256). Meanwhile, the RC*BFQ*RFQ*BBQ configuration balanced good consistency (0.917) with the highest coverage (0.610). Notably, the necessary condition RFQ appeared in all solutions for optimizing the SPP outcome except one.

Considering that parsimonious solutions represent simplified versions of complex and intermediate solutions and rely on simplifying assumptions while capturing the most crucial conditions that cannot be omitted (Pappas and Woodside, 2021), the results revealed that configurations *C1* and *C3*, involving RCL*RFQ and RSE*RFQ respectively, exhibited the highest consistency and coverage values for optimal SPP outcomes. Notably, a combination of the necessary condition RFQ prevailed with other conditions such as RSE and RCL.

Regarding the intermediate solution, the configuration *C2*: BFQ*RFQ*RCL yielded the highest consistency (0.917) for the SPP result. Notably, alongside the necessary condition RFQ, the RCL condition was commonly present in configurations with greater coverage. Following Lyngstadaas and Berg (2022), the interpretation of configurational solutions that did not exceed 1 percent unique coverage was excluded.

Table 7 presents the solutions for the model ~SPP = f (RSE, RC, BFQ, RFQ, BBQ, RCL). The configuration that best represents ~SPP is RSE*RC*BFQ*~RFQ*BBQ*~RCL, which achieved a consistency of 0.961. While the complex solution exhibited the highest consistency for the ~SPP result with a value of 0.917 and a coverage of 0.700, the most consistent configuration across intermediate and parsimonious solutions was *C4*, which revealed that the conditions ~RFQ and ~RCL generated the ~SPP outcome. This can be interpreted as follows: generally, when both specialized restaurant services and room cleanliness are inadequate, hotel guests tend to experience dissatisfaction. However, there were two other configurations (*C5* and *C6*) that produced the same result of customer dissatisfaction.

Following Ragin and Fiss (2008), Table 8 represents the intermediate and parsimonious solution results for the presence and absence of customer satisfaction. This figure allows to distinguish more intuitively between core and peripheral conditions for each configuration. Core conditions are those that are present in both solutions, while the peripherals are those that only appear in the intermediate solution.

In general terms, the case study revealed that the hotel service configurations that most influence customer satisfaction (SPP) are determined by the quality of food in specialized restaurants (RFQ). Specifically, the necessary condition RFQ prevailed in combination with other factors such as Room Cleanliness (RCL) and Buffet Food Quality (BFQ). Additionally, the RCL condition was commonly found in configurations with greater coverage across solutions for customer satisfaction. On the other hand, intermediate and parsimonious solutions

Table 5
Reduced truth tables for SPP and ~SPP.

RSE	RC	BFQ	RFQ	BBQ	RCL	number	**SSP**	raw consistency	PRI consistency
0	1	1	1	1	0	4	1	0.984	0.888
1	1	1	1	1	1	4	1	0.952	0.875
0	1	1	1	0	1	2	1	0.952	0.803
0	1	1	1	1	1	1	1	0.948	0.765
1	1	1	1	1	0	4	1	0.937	0.737
1	1	1	0	1	1	1	1	0.945	0.727
0	1	0	1	0	0	1	1	0.954	0.640
1	1	0	1	1	1	2	1	0.886	0.629
0	0	1	1	0	1	1	1	0.928	0.614
0	1	1	0	1	1	1	1	0.912	0.569
0	0	1	0	1	1	1	1	0.924	0.564
1	1	0	0	1	1	1	1	0.915	0.533
1	0	1	1	1	0	3	1	0.908	0.531
1	1	1	0	1	0	1	0	0.940	0.392
0	0	0	1	1	0	1	0	0.946	0.373
0	0	1	1	1	0	1	0	0.901	0.284
0	0	0	1	0	1	1	0	0.841	0.266
0	0	1	1	0	0	1	0	0.884	0.190
0	0	0	0	0	0	3	0	0.810	0.161
0	0	0	0	0	1	4	0	0.684	0.153
0	0	0	1	0	0	3	0	0.800	0.089
RSE	RC	BFQ	RFQ	BBQ	RCL	number	**~SPP**	raw consistency	PRI consistency
0	0	0	1	0	0	3	1	0.981	0.911
0	0	0	0	0	0	3	1	0.963	0.839
0	0	1	1	0	0	1	1	0.973	0.810
0	0	0	0	0	1	4	1	0.925	0.800
0	0	0	1	0	1	1	1	0.943	0.734
0	0	1	1	1	0	1	1	0.958	0.697
1	1	1	0	1	0	1	1	0.961	0.608
0	0	0	1	1	0	1	1	0.963	0.569
1	0	1	1	1	0	3	0	0.895	0.469
0	0	1	0	1	1	1	0	0.901	0.436
0	1	1	0	1	1	1	0	0.884	0.431
0	0	1	1	0	1	1	0	0.885	0.386
1	1	0	0	1	1	1	0	0.887	0.378
1	1	0	1	1	1	2	0	0.807	0.371
0	1	0	1	0	0	1	0	0.918	0.360
1	1	1	0	1	1	1	0	0.853	0.272
0	1	1	1	1	1	1	1	0.831	0.235
0	1	1	1	0	1	2	1	0.806	0.197
1	1	1	1	1	0	4	1	0.798	0.161
1	1	1	1	1	1	4	1	0.666	0.125
0	1	1	1	1	0	4	1	0.874	0.092

Table 6
SPP solutions.

Model: SPP = f (RSE, RC, BFQ, RFQ, BBQ, RCL)						
SOLUTIONS		raw coverage	unique coverage	Consistency	coverage solution	consistency solution
COMPLEX SOLUTION	RC*BFQ*RFQ*BBQ	0.610	0.038	0.917	0.796	0.842
	RSE*RC*BBQ*RCL	0.457	0.039	0.880		
	~RSE*BFQ*RFQ*~BBQ*RCL	0.353	0.037	0.936		
	RSE*BFQ*RFQ*BBQ*~RCL	0.445	0.053	0.892		
	~RSE*RC*~BFQ*RFQ*~BBQ*~RCL	0.256	0.018	0.954		
PARSIMONIOUS SOLUTION	*C1:* RCL*RFQ	0.765	0.068	0.879	0.897	0.805
	C2: BFQ*RCL	0.560	0.035	0.849		
	C3: RSE*RFQ	0.730	0.063	0.859		
INTERMEDIATE SOLUTION	*C1*: RCL*RFQ	0.765	0.091	0.879	0.886	0.822
	C2: BFQ*RFQ*RCL	0.537	0.020	0.917		
	C3: RSE*BFQ*RFQ*BBQ	0.639	0.053	0.887		

Table 7
Table of solutions for ~SPP.

Model: ~SPP = f (RSE, RC, BFQ, RFQ, BBQ, RCL)						
SOLUTIONS		raw coverage	unique coverage	consistency	coverage solution	consistency solution
COMPLEX SOLUTION	~RSE*~RC*~BFQ*~BBQ	0.544	0.192	0.933	0.700	0.917
	~RSE*~RC*RFQ*~RCL	0.471	0.103	0.947		
	RSE*RC*BFQ*~RFQ*BBQ*~RCL	0.244	0.036	0.961		
PARSIMONIOUS SOLUTION	*C4:* ~RFQ*~RCL	0.369	0.024	0.946	0.730	0.878
	C5: ~RC*~BFQ	0.595	0.176	0.902		
	C6: ~RSE*~RC*~RCL	0.518	0.095	0.905		
INTERMEDIATE SOLUTION	*C4:* ~RFQ*~RCL	0.369	0.036	0.946	0.712	0.895
	C5: ~RSE*~RC*~BFQ*~BBQ	0.544	0.160	0.934		
	C6: ~RSE*~RC*~RCL	0.518	0.114	0.905		

Table 8
Main findings of fsQCA analysis.

	Configurations					
	Satisfaction for Price Paid (SPP)			Absence of Satisfaction for Price Paid (~SPP)		
Conditions	C1	C2	C3	C4	C5	C6
Reception Speed and Efficiency (RSE)			●		⊗	⊗
Room Comfort (RC)					⊗	⊗
Buffet Food Quality (BFQ)		●	•		⊗	
Specialized Restaurant Food Quality (RFQ)	●	•	●	⊗		
Bar Beverage Quality (BBQ)			•		⊗	
Room Cleanliness (RCL)	●	●		⊗		⊗

Note. ● = causal condition present; ⊗ = causal condition absent; blank space = do not care condition. Large circle: core condition; small circle: peripheral condition.

indicated that conditions ~RC and ~RCL generated the ~SPP outcome. In essence, when room comfort or room cleanliness fall short in combination with low levels of other conditions, hotel guests tend to experience dissatisfaction.

Consequently, in practice, the hotel under study restricts buffet restaurant services during the off-peak tourist season and offers specialized restaurant services as an alternative. The hotel management should pay special attention to the variability of restaurant and cleaning services, which are strongly associated with customer satisfaction.

5. Conclusions

A case study was used to identify how to obtain CS through the assessment of SQ condition configurations. In conjunction with consistent configuration solutions, the necessity and sufficiency analyses demonstrated that customer perception is mainly determined by the quality of food in specialized restaurants (RFQ). Notably, the room cleanliness condition (RCL) was present in configurations with greater coverage across all solutions for customer satisfaction. Thus, resources could be optimized considering the contributions of individual services to customer perceived value.

In addition, this research has shown that using the fsQCA tool with a comparative research focus and configurational thinking is useful for identifying combinations of explanatory conditions that produce a specific outcome of interest. This instrument takes into account the impact of contextual factors and is based on a configurational proposition that is characterized by causal complexity, conjunction, equifinality, and asymmetry. This provides better reasoning for understanding how the relationships between SQ conditions and CS can lead to the best results in hotel services.

Assessing the SQ outcomes of hotel services and understanding how they influence CS levels is a crucial first step to investigating the SQ dimensions that impact these processes. This evaluation allows the adaptation of customers' specific needs and a direct impact on the perceived value of SQ, which, in turn, enables the obtention of sustainable competitive advantages in the market.

5.1. Theoretical considerations

Two ideas identify this article's theoretical contribution. The first is that it introduced a configurational analysis instrument that allowed the visualization of the complex interactions among the hotel services' individual contributions to the identification of customers' perceived value and the management of hotel processes and activities. The second is related to the fact that this proposal enabled the identification of the key areas of the hotel's service that affect CS, considering the context and the attributes of the specific services (Luk and Layton, 2004; Akbaba, 2006). The consideration of dimensions in specific hotel functions such as reception, food and beverages, and rooms (Sangpikul, 2022b) is a necessary preliminary step to responding to the attempts by different researchers to determine the quality dimensions that influence CS. Considering that SQ varies depending on the type of service and context (Chen et al., 2021; Park et al., 2021), a configurational approach based on causal complexity identified the services that influenced the hotel's CS as a previous step to identifying the SQ dimensions that affected each particular service. In addition, knowing the individual contribution of the customers' perceived value of each hotel service allowed an adequate evaluation of the interactions of the five SERVQUAL model SQ dimensions, which is something to consider for further research.

Visualizing these interactions to identify customers' perception of value helps reduce the gap between the expectations and perceptions of services, which can result in more satisfied customers and longer-lasting relationships. This contributes to Grönroos' (1982) service marketing theory, which establishes that to achieve a positive reputation and a desirable corporate image, a company must successfully manage its interactive marketing function.

So, our research has demonstrated that different combinations of perceived quality exist in some services that produce customer satisfaction in the analyzed hotel. The findings of this research are theoretically relevant as they address complexities beyond the linear relationship between SQ and CS and respond to the lack of consensus in the literature on the SQ dimensions that impact hotel CS. The results could be the same for other hotels with the same characteristics and services but will no doubt vary for hotels with different characteristics and services.

5.2. Practical considerations

This research has some important practical implications since the solutions for optimizing CS determined by the different SQ service configurations help managers not only recognize which attributes they should improve but also reduce their costs by identifying the attributes that they no longer need to focus on.

Thus, a decision strategy is offered for the hotel sector, where the changing nature of CS suggests that customer perception should constantly be evaluated and services aligned accordingly (Zeithaml, 1988). Therefore, through the configuration of conditions, solutions have been identified to optimize customer satisfaction by adjusting the quality dimensions according to the specificities of the service and the hotel context.

5.3. Limitations

Although the explanatory power of fsQCA allows the complex interactions between the individual contributions of different hotel services to CS to be visualized, the method does not provide generalizable results. Furthermore, although the present research contributes a methodology that holistically and comprehensively reveals how the quality of different services influences CS in the hotel sector, the results were obtained from a standardized questionnaire of specific quality perceptions over seven years in a single hotel that was not specifically designed for the objectives of this research or for the used methodology.

Also, a common limitation that must still be referred to in research where questionnaires are only answered by the customers who decide to do so, is the lack of complete randomness of the sample.

Finally, it must also be taken into account that the types of services chosen depended on the hotel that was analyzed and that these may vary for other hotels. It would, therefore, be advisable to undertake new research in other hotels in different environments and with different characteristics to evaluate the behavior of quality dimensions in the identified key processes that affect CS.

CRediT authorship contribution statement

Macarena Sacristán-Díaz: Methodology, Project administration, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Vladimir Perdomo-Verdecia:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Writing – review & editing. **Pedro Garrido-Vega:** Software, Supervision, Validation, Visualization, Writing – review & editing.

Declaration of Competing Interest

None

APPENDIX. . Normalized values obtained from surveys

Cases	Conditions						Result
(month/year)	RSE	RC	BFQ	RFQ	BBQ	RCL	SPP
J01	0.387	0.639	1.000	0.933	0.274	0.730	0.645
F01	0.317	0.391	0.397	0.412	0.323	0.496	0.636
N01	0.331	0.677	0.489	0.779	0.353	0.199	0.620
J02	0.404	0.399	0.850	0.495	0.517	0.730	0.386
F02	0.462	0.296	0.807	0.618	0.412	0.889	0.647
N02	0.114	0.266	0.404	0.482	0.240	0.018	0.272
J03	0.000	0.000	0.060	0.000	0.000	0.730	0.000
F03	0.071	0.380	0.415	0.589	0.193	0.496	0.338
N03	0.771	0.715	0.753	0.703	0.580	0.199	0.673
J04	0.422	0.601	0.567	0.460	0.588	0.730	0.147
F04	0.307	0.356	0.000	0.198	0.071	0.889	0.444
N04	0.190	0.261	0.461	0.535	0.147	0.018	0.440
J05	0.625	0.568	0.877	0.632	0.567	0.730	0.830
F05	0.745	0.867	0.748	0.820	0.619	0.496	0.660
N05	0.586	0.552	0.722	0.928	0.678	0.199	0.517
J06	0.492	0.068	0.417	0.494	0.490	0.730	0.440
F06	0.155	0.397	0.410	0.769	0.487	0.889	0.420
N06	0.108	0.038	0.366	0.607	0.241	0.018	0.326
J07	0.208	0.473	0.026	0.153	0.423	0.730	0.285
F07	0.082	0.299	0.075	0.374	0.367	0.496	0.159
N07	0.445	0.337	0.350	0.703	0.559	0.199	0.535
M01	0.672	0.859	0.425	0.723	0.593	0.730	0.798
S01	0.473	0.639	0.711	0.643	0.486	0.889	0.591
O01	0.429	0.516	0.546	0.595	0.642	0.018	0.509
M02	0.461	0.579	0.526	0.535	0.581	0.730	0.741
S02	0.393	0.666	0.802	0.742	0.521	0.496	0.677
O02	0.464	0.736	0.557	0.744	0.583	0.199	0.651

(continued on next page)

(*continued*)

Cases	Conditions						Result
(month/year)	RSE	RC	BFQ	RFQ	BBQ	RCL	SPP
M03	0.842	1.000	0.835	0.764	0.563	0.730	0.821
S03	0.616	0.508	0.730	0.574	0.501	0.889	0.410
O03	0.569	0.092	0.760	0.705	0.555	0.018	0.250
M04	0.541	0.505	0.721	0.389	0.597	0.730	0.599
S04	0.712	0.446	0.917	0.982	0.680	0.496	0.562
O04	0.633	0.177	0.750	0.859	0.836	0.199	0.744
M05	0.641	0.671	0.044	1.000	1.000	0.730	0.347
S05	1.000	0.989	0.384	0.434	0.911	0.889	0.483
O05	0.495	0.625	0.926	0.930	0.719	0.018	0.543
M06	0.712	0.731	0.838	0.683	0.761	0.363	0.468
S06	0.406	0.337	0.645	0.768	0.689	0.327	0.423
O06	0.796	0.554	0.606	0.479	0.601	0.000	0.378
M07	0.774	0.734	0.636	0.839	0.756	0.540	0.863
S07	0.879	0.717	0.634	0.739	0.980	1.000	1.000
O07	0.494	0.231	0.704	0.793	0.490	0.027	0.410

Note: Reception Speed and Efficiency (RSE), Room Comfort (RC), Buffet Food Quality (BFQ), Specialized Restaurant Food Quality (RFQ), Bar Beverage Quality (BBQ), Room Cleanliness (RCL), and Satisfaction for Price Paid (SPP).

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