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Impact of Improvements in the Built Environment of a Gas Station on Customers Satisfaction

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Abstract

In certain types of services, it is relevant to understand the role of the built environment on customer satisfaction and company revenue. Therefore, the post-occupancy evaluation of the companies physical facilities or buildings is timely. The research aimed to evaluate the impact of improvements in a gas station built environment on customer satisfaction. For this purpose, a survey was operated, with 378 respondents. The data analysis was carried out through exploratory factor analysis and multiple regression. The results indicate that customers' overall satisfaction concerning the services provided by the gas station and the built environment are related to the dimensions and attributes intrinsic to the built environment, but in a particular way, suggesting managers possibilities of adjustment in the operation and the service performed to customers.

Keywords: Built environment, Post-occupancy evaluation, Customer satisfaction, Service operations, Gas station.

Resumo

Em determinados tipos de serviços, é relevante compreender o papel do ambiente construído sobre a satisfação de clientes e o faturamento das empresas. Por isso, a avaliação pós-ocupação das instalações físicas ou edificações das empresas do setor é oportuna. Sendo assim, a pesquisa teve o objetivo de avaliar o impacto de alterações realizadas no ambiente construído na satisfação de usuários dos serviços prestados por um posto de abastecimento. Para tanto, foi operacionalizada uma pesquisa do tipo *survey*, com 378 respondentes. A análise dos dados foi realizada por meio da análise fatorial exploratória e da regressão múltipla. Os resultados indicam que a satisfação geral dos clientes tanto em relação aos serviços prestados pelo posto de abastecimento, quanto em relação ao ambiente construído estão relacionadas às dimensões e aos atributos intrínsecos ao ambiente construído, porém, de forma particular, sugerindo aos gestores possibilidades de ajuste na operação e no atendimento aos clientes.

Palavras-chave: Ambiente construído, Avaliação pós-ocupação, Satisfação de clientes, Operações em serviços, Postos de abastecimento.

Resumen

En ciertos tipos de servicios, es importante comprender el papel del entorno construido en la satisfacción del cliente y los ingresos de la empresa. Por ello, la evaluación posterior a la ocupación de las instalaciones físicas o edificios de las empresas del sector es oportuna. Por tanto, la investigación tuvo como objetivo evaluar el impacto de los cambios realizados en el entorno construido sobre la satisfacción de los usuarios de los servicios prestados por una estación de servicio. Para ello, se realizó una encuesta tipo encuesta, con 378 encuestados. El análisis de datos se realizó mediante análisis factorial exploratorio y regresión múltiple. Los resultados indican que la satisfacción general de los clientes tanto en relación con los servicios prestados por la estación de servicio como en relación con el entorno construido están relacionados con las dimensiones y atributos intrínsecos del entorno construido, sin embargo, de manera particular, sugiriendo a los gerentes posibilidades de ajuste en operación y atención al cliente.

Palabras clave: Entorno construido, Evaluación posterior a la ocupación, Satisfacción del cliente, Operaciones de Servicio, Gasolinera.

1 Introduction

Developing long-term and profitable relationships with customers has received managers' and researchers' attention to understand the requirements to establish these relationships as part of the companies' strategy. In this way, the quality of services provided to customers is a central aspect (Gounaris, 2005). In this sense, service quality is considered a determinant aspect of business performance and viability in a long-term perspective (Bolton & Drew, 1991). Therefore, it has been focused on as an alternative to consolidate and increase the market and economic-financial performance of companies (Grönroos, 1984; 1998; 2020).

Service quality reflects customers satisfaction (Grönroos, 1998; Zeithaml, Berry, & Parasuraman, 1996), which, in turn, has a positive impact on the word-of-mouth publicity, in loyalty attitude and future repurchase intention (Oliver, 2014; Wilson, Zeithaml, Bitner, & Gremler, 2012). It is an essential and strategic variable in decision models and must help managers develop strategies to conduct their activities based on logic, timely and trustful information (Zeithaml, 2000; Grönroos, 2020).

Service environments with face-to-face service interaction, the physical facilities, or more specifically, the built environment, influences the perception of quality and customer satisfaction (Silva et al., 2020; Kamaruzzaman, Egbu, Zawawi, Karim, & Woon, 2015), deserving to be further investigated. Hence, the research aimed to evaluate the impact of improvements in a gas station built environment on customer satisfaction.

2 Theoretical Background and Research Hypotheses

In some contexts, the service environment is composed of constructed realities that form the business as servicescapes, where the service is provided and delivered to customers (Bitner, 1992). Studies related to servicescapes have focused mainly on customer satisfaction (Bitner, 1992; Rosenbaum & Massiah, 2011) due to stimuli in the service environment. Baker, Parasuraman, Grewal, & Voss (2002) commented on the relevance of service structures, especially those experienced by customers, who may have a greater or lesser degree of interaction with such resources made available by service providers. It is worth mentioning that it is increasingly urgent to understand customers purchase and/or consumption experiences in order to fully serve and satisfy them (Lemon & Verhoef, 2016).

The service environment is a communicative landscape (Lundberg & Lindström, 2020) that enables service interactions and relationships (Wilson et al., 2012). Hence the importance of studying the physical environment of the service, given the need for companies to create environments increasingly suitable to perform services in line with their customers' judgment (Rosenbaum, Otalora, & Ramírez, 2016; Rosenbaum, Friman, Ramirez, & Otterbring, 2020).

Thus, the Post-occupancy Evaluation (POE) serves as an instrument to measure and evaluate the performance of physical environments available to customers, configured as a management resource (Preiser, 2005; Preiser & Wang, 2006). Therefore, such an assessment can be used as an alternative to either planning new physical facilities or improvements to existing ones (Roberts, Edwards, Hosseini, Mateo-Garcia, & Owusu-Manu, 2019; Rosenbaum & Massiah, 2011).

POE refers to any activity that evaluates the building use from its users' feedback (Preiser, 2005; Li, Froese, & Brager, 2018). APO can also be understood as a process that involves a rigorous

approach to evaluating both the physical, technological, and anthropological elements of a building in use. This is a systematic process guided by evaluations and research that take into account human needs, the building performance, and the effective management of the facilities, assessing purpose, benefits, and access barriers (Göçer, Hua, & Göçer, 2015; Li, Froese, & Brager, 2018).

There are indications that customer satisfaction is also an essential factor to be investigated with the built environment (Silva et al., 2020), defined when the perceived quality and performance of service meet or even exceed the customer expectations (Oliver, 2014). Therefore, service quality (Parasuraman, Zeithaml, & Berry, 1988; Hooper, Coughlan, & Mullen, 2013; Agus, 2019) and customer satisfaction are relevant in the management decision-making process (Macdonald, Kleinaltenkamp, & Wilson, 2016; Sandström, Edvardsson, Kristensson, & Magnusson, 2008).

More specifically, gas stations' physical facilities are investigated from the built environment perspective (Silva et al., 2020) since the physical spaces are considered facilitators of the services provided (Bitner, 1992; Wilson, Zeithaml, Bitner, & Gremler, 2012). As a result, they can effectively influence customer satisfaction. In this way, the built environment, a tangible factor of many types of services (Lamprecht, 2016), can be measured and evaluated by the dimensions appearance, comfort, configuration, and functionality (Milan, Silva, & Bebber, 2015; Preiser, Hardy, & Wilhelm, 2018).

Appearance is related to design, construction, use, and operations, which affect users' behavior (Clark, Haynes, Pinder, & Price, 2004; Pinder, Price, Wilkinson, & Demack, 2003). It relates to the service users' attraction to that environment, aesthetically, revealing aspects such as modernity and design (Pinder, Price, Wilkinson, & Demack, 2003; Kamaruzzaman et al., 2015). The comfort identifies how the thermal, acoustic, lighting, ergonomic and ventilatory comfort conditions impact users' behavior and can act together or isolated, causing positive and/or negative sensations and attitudes. It relates to the sensations of well-being and the quality of the interior environment, related to temperature, humidity, ventilation, and lighting (Kamaruzzaman et al., 2015; Sanni-Anibire, Hassanain, & Al-Hammad, 2016).

The configuration of the built environment, in turn, must evaluate the existence and dimensioning (size) of the available spaces and refers to the quantity and distribution of spaces, as well as the ease of locomotion of people (Pinder, Price, Wilkinson, & Demack, 2003; Pinder & Price, 2005). Functionality refers to the functional performance of the spaces resulting from the implemented architectural project (Pinder, Price, Wilkinson, & Demack, 2003), considering aspects of site suitability for use and accessibility, also including aspects related to user privacy (Pinder, Price, Wilkinson, & Demack, 2003; Ornstein & Ono, 2010). For example, gas station customers satisfaction is the result of the evaluation of their experiences from a set of perceptions that involves the evaluation of the purchase and/or consumption experience as a whole, the services offered and experienced, and the facilities throughout repurchase experiences (Silva et al., 2020).

Given the above discussion, the following research hypotheses were elaborated:

H_{1a}: The built environment dimensions (appearance, comfort, configuration, and functionality) positively impact the overall satisfaction of customers concerning the services provided by the gas station.

H_{1b}: The built environment attributes positively impact customers' overall satisfaction concerning the services provided by the gas station.

H2a: The built environment dimensions (appearance, comfort, configuration, and functionality) positively impact the overall satisfaction of customers concerning the built environment.

H2b: The built environment attributes positively impact customers' overall satisfaction concerning the built environment.

3 Research Method

The research is a quantitative and descriptive study (Malhotra, Nunan, & Birks, 2017), specifically, a cross-sectional survey (Saris & Gallhofer, 2014). Participants in the research were customers of a gas station located in a city in Southern Brazil. The gas station runway comprises four quadruple pumps, has a check-out next to the convenience store, has seven parking slots in an uncovered area, and is located on an access road to the city center. Figures 1 and 2 illustrate the built environment of the gas station (external images). Figure 1 presents a picture before the refurbish, while Figure 2 presents a picture after the refurbish.

Figure 1. Before refurbishing

Figure 2. After refurbishing

The data collection instrument (questionnaire) was composed of the four built environment dimensions (appearance, comfort, configuration, and functionality) and their respective attributes (Hassanain & Iftikhar, 2015; Kamaruzzaman et al., 2015; Milan et al., 2015; Orihuela & Orihuela, 2014), as well as other attributes added on site suitability for use, accessibility and privacy in the use of the environment (Pinder, Price, Wilkinson, & Demack, 2003; Ornstein & Ono, 2010), as shown in Figure 3.

Appearance
AP1: The appearance (external and internal) is well preserved (materials well preserved); AP2: The paving is in good condition; AP3: The appearance on the supply islands (pumps) is pleasant; and AP4: This gas station positively calls for my attention compared to other brands of gas stations.
Comfort
CO1: Furniture or equipment is suitable for general activities; CO2: The gas station provides an environment with shade and weather protection (rain, wind, intense sun); CO3: The lighting is adequate in the supply of gas pumps; CO4: The lighting is adequate in the convenience store; and CO5: The temperature is pleasant in the convenience store.
Configuration
CG1: There are clean, organized, and private bathrooms; CG2: The restrooms' location is adequate and well signaled; CG3: Parking is adequate; CG4: There is a suitable place for vehicle showers and tire calibration; CG5: There is a suitable place to change the oil; and CG6: Other products and services provided by the station are visible (calibration, vacuum cleaner, shower).
Functionality
FU1: The environment is functional for the physically disabled; FU2: Circulation in external and internal spaces is sufficient; FU3: The gas station has a safe environment; FU4: There are areas dedicated to leisure and/or waiting; and FU5: The gas station has proper functioning in complementary services (tire calibration, shower, vacuum cleaner).

Figure 3. Dimensions and attributes of the built environment

Based on these dimensions and attributes, the relationship with customers overall satisfaction concerning the services provided by the gas station and its built environment was measured – as presented in the hypothesized relationships (Fornell et al., 1996; Fernandes & Cruz, 2016; Silva et al., 2020), in two different moments, before and after refurbish (network standardization) of the studied gas station (Figures 1 and 2). For this purpose, a seven-point Likert scale was used, ranging from "1. I totally disagree" to "7. I totally agree" (Bearden, Netemeyer, & Haws, 2011). Customer satisfaction was used as a dependent variable, assessing customers' perceptions regarding the dimensions and attributes intrinsic to the environment (Figure 3). For overall satisfaction, a seven-point Likert scale was also used, ranging from "1. Totally unsatisfied" to "7. Totally satisfied" (Bearden, Netemeyer, & Haws, 2011). The researchers personally approached respondents, randomly selected at two times: in November and December 2018 (before refurbish) and between June and August 2019 (after refurbish). The sample resulted in 378 cases, 100 collected before the refurbish and 278 data collected after.

For data analysis, Exploratory Factor Analysis (EFA) was initially used by the main components extraction method and Oblimin orthogonal rotation (Gorsuch, 2015; Johnson & Wichern, 2007) to verify the unidimensionality of the dimensions aiming to validate them. Based on the EFA results, the multivariate regression analysis (Hair Jr. et al., 2018; Malhotra, Nunan, & Birks, 2017) was applied to evaluate the relationship between the dimensions (and respective attributes) and the overall satisfaction of the gas station customers, comparing the sub-samples (before and after refurbish), followed by the comparison between the averages of each of the attributes and their respective dimensions, according to the respondents' perception. The regression method used was the "backward" method since the backward regression algorithm itself only maintains what is most significant in the models measured (Hair Jr. et al., 2018). Besides, chi-square, t-student, variance analysis, and multiple linear regression tests were performed. The statistical significance level was set at 0.05 (Hair Jr. et al., 2018; Tabachnick, Fidell, & Ullman, 2012). It is worth mentioning that analyses were performed using the statistical software SPSS 20.

4 Results and Discussion

4.1 Respondents profile

The sample covered 78.9% male and 21.1% female customers. The data collected before the refurbish corresponds to 22.1% of the data, while after the refurbish, this percentage is 77.9%. Concerning the age group, 11.8% of the respondents are between 19 and 25 years old, 42.1% between 26 and 40 years old, 39.5% between 41 and 60 years old, and finally over 61 years old correspond to 6.6% of the sample. As for the marital status, most respondents are married, 60.5%, followed by 28.9% single, 5.3% stable union, 3.9% separated, and 1.3% divorced. Regarding schooling, 14.5% of the respondents have incomplete elementary education, 9.2% complete elementary education, 11.8% incomplete high school, 36.8% complete high school, 14.5% higher education, and 13.2% post-graduation. Finally, in their majority, customers have income above five minimum wages, and more than 82% of them live with a maximum of three people in the house.

4.2 Exploratory Factor Analysis (EFA)

In the EFA, the attributes that obtained factor loadings lower than 0.5 were considered unsatisfactory and removed from the analyses (Malhotra, Nunan, & Birks, 2017). Even so, the four built environment theoretical dimensions initially considered were confirmed, composed of fourteen attributes.

The reconfiguration of the dimensions, with their respective attributes, are presented in Table 1. Moreover, as it is possible to analyze in Table 1, the Cronbach's Alpha of the constructs are between 0.662 and 0.763, that is, above that recommended in the literature (Malhotra, Nunan, & Birks, 2017). It is appropriate to comment that the correlation matrix results between the four dimensions (or factors) were also satisfactory.

Table 1. Exploratory Factor Analysis

Attributes	**Components**				**Communalities**
	1	**2**	**3**	**4**	**Extraction**
FU5	0.693				0.523
FU1	0.671				0.495
CG3	0.585				0.596
FU4	0.578				0.527
FU3	0.534				0.463
CG2		0.921			0.806
CG1		0.758			0.697
CO2		0.556			0.527
CG4			0.679		0.664
CO5			0.676		0.627
CO4			0.630		0.635
CO3				0.773	0.654
CO1				0.712	0.656
AP4				0.557	0.496
% of Variance	33.584	10.828	8.044	7.314	**59.770**
Cronbach's Alpha	0.763	0.662	0.656	0.687	

Note: Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. KMO: 0.840; Chi-Square: 1371.704; df: 91; Sig. 0.000.

The formation of the new dimensions makes it clear which aspects are being perceived and more valued by customers (the reorganizing of the four dimensions and fourteen attributes), in addition to those other six attributes that are not relevant to customers at the gas station and that have been excluded (AP1, AP2, AP3, FU2, CG4, CG5, and CG6). The result obtained contributes theoretically to the adequacy and validation of the dimensions and attributes used for the POE.

4.3 Comparison between before and after the refurbishing of the gas station

Regarding the dimensions, Appearance, Functionality, and Configuration showed significant differences between their averages, highlighting the impact of the refurbish and improvements in the built environment. However, the Comfort dimension showed no significant difference between the averages. By the way, the average of the Configuration dimension increased by 13.58% due to the refurbishing effect, while Functionality and Appearance had their perceptions decreased by -4.38% and -6.38%, as presented in Table 2.

As for the perceived differences between the attributes, only the items CO4 (lighting is adequate in the convenience store) and FU3 (the gas station has a safe environment) have not shown differences. With a significant increase caused by refurbishing, the CO2 (the gas station provides an environment with shade and weather protection – rain, wind, intense sun) increased 21.02%, and CG1 (there are clean, organized, and private bathrooms) increased 6.23%. There was a significant difference between the averages analyzed in these attributes and that, in general, customers evaluate them better after refurbish. On the other hand, the dependent variables "SAT01: What is your overall satisfaction concerning the services provided by the gas station?" and "SAT02: What is your overall satisfaction concerning the built environment of the gas station?", when compared, indicated no significant difference between the averages (see Table 2).

Table 2. Mean differences

Dimensions	Antes n = 76		After n = 268		t-test for Equality of Means		
	Mean	Std. Deviation	Mean	Std. Deviation	t	df	Sig. (2-tailed)
	Statistic	Statistic	Statistic	Statistic			
Functionality	6.61	0.06	6.32	0.04	3.95	342	0.000
Configuration	5.67	0.66	6.44	0.54	-10.341	342	0.000
Appearance	6.43	0.66	6.02	0.65	4.777	121	0.000
Comfort	6.65	0.44	6.67	0.43	-0.311	342	0.756
CO1	6.43	0.91	6.06	0.80	3.203	110	0.002
CO2	5.28	1.10	6.39	0.70	-8.330	93	0.000
CO3	6.42	0.80	6.01	0.96	3.393	342	0.001
CO4	6.45	0.74	6.60	0.52	-1.628	104	0.107
CO5	6.79	0.52	6.59	0.59	2.851	134	0.005
CG01	6.10	0.61	6.48	0.69	-0.682	136	0.000
CG03	6.72	0.58	6.34	0.77	4.680	157	0.000
FU01	6.65	0.77	6.35	0.076	3.020	342	0.003
FU03	6.47	0.99	6.40	0.74	0.580	100	0.563
FU04	6.45	0.94	6.01	1.00	3.397	342	0.001
SAT01	6.46	0.81	6.41	0.65	0.560	342	0.576
SAT02	**6.38**	**0.75**	**6.44**	**0.72**	**-0.580**	**342**	**0.562**

4.4 Impact of the built environment dimensions on customer overall satisfaction with the services provided by the gas station

Multiple regression was used to understand how different aspects of the built environment impact and explain "SAT01" ($H_{1a,b}$) and "SAT02" ($H_{2a,b}$) (Hair Jr. et al., 2018; Malhotra, Nunan, & Birks, 2017). The multiple regression enter method was used to identify each dimension's weight related to satisfaction (SAT01 and SAT02). When the attributes were tested, we opted to use the stepwise regression method because they were many items, retaining only the significant ones in the final models.

The R-value of 0.438 indicated an adequate prediction level, with R^2 adjusted to 0.182, indicating that the proportion of variance of the "Overall customer satisfaction with the services provided by the gas station (SAT01)" can be explained in 18.2%, by the dimensions (or factors) Comfort, Configuration, Functionality, and Appearance, with Durbin-Watson's statistics between 1.5 and 2.5. Therefore, the data are not autocorrelated. The regression equations were significant for the dimensions Functionality ($\beta = 0.074$; $p < 0.01$) and Comfort ($\beta = 0.093$; $p < 0.05$). The dimensions Configuration ($\beta = 0.057$; $p < 0.01$) and Appearance ($\beta = 0.062$; $p < 0.01$) resulted in a boundary zone of significance (see Table 3).

Table 3. H_{1a} test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.962	0.546		3.595	0.000		
Functionality	0.247	0.074	0.212	3.334	0.001	0.591	1.692
Configuration	0.109	0.057	0.103	1.905	0.058	0.814	1.228
Comfort	0.218	0.093	0.138	2.350	0.019	0.694	1.441
Appearance	0.122	0.062	0.120	1.963	0.051	0.642	1.558

Dependent Variable: SAT01.
Notes: R = 0.438; R^2 = 0.192; Adjusted R^2 = 0.182; F Change = 20.135; Sig. F = 0.000; Durbin-Watson = 1.921.
Predictors: (Constant), Appearance, Functionality, Comfort, Configuration.

4.5 Impact of the built environment dimensions on customer overall satisfaction with the built environment

The R-value of 0.458 indicated an adequate prediction level, with R^2 adjusted of 0.210, indicating that the proportion of variance of "Satisfaction with the built environment (SAT02)" can be explained in 21.0%, by the dimensions Comfort, Configuration, Functionality, and Appearance. The Durbin-Watson statistic is between 1.5 and 2.5, and the data are not autocorrelated. The regression equations were significant for the dimensions Functionality ($\beta = 0.0280$; $p < 0.000$) and Configuration ($\beta = 0.135$; $p < 0.05$). The Comfort dimensions ($\beta = 0.096$; $p < 0.01$) showed a result in a boundary zone of significance (see Table 4).

Table 4. H_{2a} test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.683	0.573		2.939	0.004		
Functionality	0.346	0.078	0.280	4.455	0.000	0.591	1.692
Configuration	0.152	0.060	0.135	2.522	0.012	0.814	1.228
Comfort	0.161	0.097	0.096	1.656	0.099	0.694	1.441
Appearance	0.083	0.065	0.077	1.276	0.203	0.642	1.558

Dependent Variable: SMEAN (SAT02)
Notes: R = 0.458; $R^2 = 0.210$; Adjusted $R^2 = 0.200$; F Change = 22.501; Sig. F = 0.000; Durbin-Watson = 1.603.
Predictors: (Constant), Appearance, Functionality, Comfort, Configuration.

4.6 Impact of the built environment attributes on customer overall satisfaction with the services provided by the gas station

The R-value of 0.4211 indicate adequate prediction level, with R^2 adjusted of 0.177, evidencing that 16.8% of the variance of "Overall customer satisfaction (SAT01)" can be explained by the attributes "Furniture or equipment is suitable for general activities (CO1; $\beta = 0.142$; $p < 0.05$)", "The environment is functional for the physically disabled (FU1; $\beta = 0.157$; $p < 0.01$)", "Lighting is adequate in the convenience store (CO4; $\beta = 0.177$; $p < 0.001$)" and "Parking is adequate (CG3; $\beta = 0.132$; $p < 0.05$)", resulting in Durbin-Watson's statistics between 1.5 and 2.5, confirming that the data are not autocorrelated (see Table 5).

Table 5. H_{2a} test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.765	0.442		6.250	0.000		
CO1	0.116	0.046	0.142	2.515	0.012	0.764	1.309
FU1	0.139	0.049	0.157	2.867	0.004	0.809	1.236
CO4	0.194	0.058	0.177	3.349	0.001	0.874	1.144
CG3	0.122	0.052	0.132	2.341	0.020	0.764	1.308

Dependent Variable: SAT01.
Notes: R = 0.421; $R^2 = 0.177$; Adjusted $R^2 = 0.168$; F Change = 18.255; Sig. F = 0.000; Durbin-Watson = 1.956.
d. Predictors: (Constant), CO1, FU1, CO4, CG3.

4.7 Impact of the built environment attributes on customer overall satisfaction with the built environment

The R-value of 0.476 indicate an adequate prediction level, with R^2 adjusted of 0.213, indicating that 21.3% of the variance of "Satisfaction with the built environment (SAT02)" can be explained by the attributes "There are areas dedicated for leisure and/or waiting (FU4; $\beta = 0.175$; $p < 0.001$)",

"There are clean, organized and private bathrooms (CG1; β = 0.134; p < 0.05)", "The temperature is pleasant at the convenience store (CO5; β = 0.128; p < 0. 05)", "The gas station has a safe environment (FU3; β = 0.106; p < 0.05)"; "The environment is functional for the physically disabled (FU1; β = 0.111; p < 0. 05)" and "The gas station provides an environment with shade and weather protection – rain, wind, intense sun) (CO2; β = 0.101; p < 0.05)". Durbin-Watson's statistics are between 1.5 and 2.5, showing the data are not autocorrelated (see Table 6).

Table 6. H_{2b} test

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	1.908	0.498		3.831	0.000		
FU4	0.127	0.040	0.175	3.173	0.002	0.751	1.331
CG1	0.140	0.056	0.134	2.493	0.013	0.798	1.253
CO5	0.161	0.066	0.128	2.424	0.016	0.819	1.220
FU3	0.097	0.052	0.106	1.843	0.066	0.691	1.448
FU1	0.104	0.051	0.111	2.047	0.041	0.788	1.270
CO2	0.079	0.040	0.101	1.993	0.047	0.895	1.117

Dependent Variable: SAT02.
Notes: R = 0.476; R^2 = 0.266; Adjusted R^2 = 0.213; F Change = 16.434; Sig. F = 0.000; Durbin-Watson = 1.616.
Predictors: (Constant), FU4, CG1, CO5, FU3, FU1, CO2.

5 Final Considerations

The research contributes with studies that evaluate the built environment impact on customer satisfaction, in this case, in the context of a gas station, to better understand its dimensions and attributes, before and after a refurbishing. Two different moments of a single service environment were compared, relating the impact of the built environment dimensions (appearance, configuration, functionality, and comfort) and their respective attributes, to customer satisfaction. The study aimed to identify the aspects of customer satisfaction that could justify the 16.59% increase in fuel volume, which could be related to the refurbishing carried out from 2018 to 2020.

The results obtained on attributes and dimensions evaluated showed a positive and significant impact on the hypotheses tested: $H_{1a,b}$ related to customers overall satisfaction with the services provided by the gas station and $H_{2a,b}$ related to customers overall satisfaction specifically with the built environment, which generates interesting insights for managers and researchers in the area. In this sense, the use of more than one dimension is justified to evaluate the built environment, as it is a multidimensional construction, associated with the evaluation of the experience with the service, through its relationship with customers overall satisfaction, as suggested by Hassanain, Alnuaimi, & Sanni-Anibire (2018).

Although various tools can measure business satisfaction and effectiveness, this study contributes by relating POE metrics, which start from customer evaluation and judgment to identify the physical elements that contribute to business performance. Besides, it contributes to Pinder & Price (2005) findings, who stated that building occupants should be treated as customers and that their perceptions are decisive in assessing the built environment's performance. Therefore, they included the customer judgment to evaluate the built environment. Customer satisfaction results are determinant of the intention to recommend the gas station to other people and repurchase intention, similar to Rosenbaum et al. (2016) findings.

The gas station refurbish seemed to encourage and improve consumer judgment on the built environment configuration and functionality and their attributes and demonstrate an impact on

satisfaction, which justifies satisfaction and business performance improvements. Therefore, while not altering customer perception and judgment related to overall satisfaction and the built environment, the refurbishment helps to encourage customer behavior and promote satisfaction, especially to attributes related to the environment configuration and functionality.

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