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Does the Airport Servicescape Affect the Relationship between Airport Outcome Quality and Passenger Satisfaction?

Davidi Stephano[1]
Assistant Lecturer, Department of Transport and Logistics Studies, National Institute Transport, Dar es Salaam, Tanzania
Dev Jani
Professor, Department of Marketing, University of Dar es Salaam, Dar es Salaam, Tanzania
David Mfinanga
Professor, Department of Transportation and Geotechnical Engineering, College of Engineering and Technology, University of Dar es Salaam, Dar es Salaam, Tanzania

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Abstract
Airports promote passenger satisfaction with superior service. Airport outcome quality (AOQ) is a part of Airport Service Quality (ASQ), which impacts daily service performance. In this study, the airport servicescape influenced the link between airport outcome quality and passenger satisfaction. The model was developed using the Hierarchical Service Quality Model (HSQM) and Stimulus-Organism-Response (SOR) theory, incorporating two direct and moderated paths. The study utilized a convenience sampling technique and conducted a cross-sectional survey of international travellers at critical airports in Tanzania. 389 respondents were evaluated using the PLS-SEM technique. Significant enhancements have been made in the direct and moderated relationships between airport outcome quality and passenger satisfaction. The airport environment was more effectively managed than the direct route. The environment of an airport improves the satisfaction of international airport passengers. Moreover, these findings have implications for theory, methodology, management, and policy. The study enhances the partial least squares research methodologies, specifically for higher-order structures. The study shows airport architects and officials that the airport servicescape is crucial for improving customer satisfaction at airport terminals.

Keywords: Airport outcome quality, Airport servicescape, Hierarchical Service Quality, Satisfaction

[1] Corresponding Author: davidstephano39@gmail.com

Introduction

Passenger satisfaction is crucial in airport management because revenues increase once passengers are happy with the services offered (Bezerra & Gomes, 2020; Pantouvakis & Renzi, 2016). Passenger satisfaction measures how passengers derive value from airport services compared to their expectations (Lee & Yu, 2018). It is a vital component of management strategies to prosper and survive in competitive environments (Caro & García, 2007; Yang et al., 2015). Passenger satisfaction (PS) at international airports became an essential study area because an international airport typically manages air passengers from various nations (Saut & Song, 2022). It is not easy to foresee the nature of international passengers' expectations due to the diversity of culture, exposure, and experience in different nations (Bezerra & Gomes, 2016). Airport authorities and governments invest vast amounts of money in infrastructure development. International Air Transport Association (IATA) estimated that in the next 15 years, from 2014 to 2029, over $1 trillion would be spent on airport infrastructure development to handle the increased traffic and improve service quality (Hussain, 2010). Nevertheless, from 2016 to 2019, IATA received approximately 10,000 crucial passenger complaints about airport services yearly (Hunter, 2016; Schmollgruber et al., 2018; Taheri et al., 2020) that indicates a challenge to the airport managers in managing the airport spaces.

Studies indicate that passenger satisfaction (PS) is influenced by airport outcome quality (AOQ), in which the airport outcome quality is assessed as a high-level construct consisting of three lower-level constructs (Balinado et al., 2021; Bezerra & Gomes, 2020). Prior research on the relationship between airport outcome quality and passenger satisfaction yielded conflicting results (Bezerra & Gomes, 2016; Halpern & Mwesiumo, 2021; Wu & Cheng, 2013), with some indicating strong relationships and other absence of relationships. Such conflicting results possibly emanate from the fact that AOQ is a higher order construct but commonly used as a single independent variable in previous studies. Furthermore, the complexity of measuring PS apart from the causal factor of AOQ is caused by the many factors, such as culture, experience, and travel aims, and the servicescape which might affect their perception of service quality through different aspects (Bezerra & Gomes, 2016; Fodness & Murray, 2007) that further conflates the causal relationship between AOQ and PS. Adeniran and Fadare (2018) indicates among the various factors influencing AOQ and PS is airport servicescape due to the relative time that passengers spend within the airport before take-off and after landing.

AOQ is one of the vital dimensions of airport service quality (ASQ) under the Hierarchical Service Quality Model (HSQM), and it is measured as a high-order construct. The HSQM devised by Brady and Cronin (2001) demonstrated that service quality is frequently viewed as a multidimensional concept with three low-order dimensions: outcome, interaction and access quality. Before HSQM, low-order models like SERVQUAL and SERVPERF models were criticized for their applicability in different contexts. Numerous studies have been conducted to measure PS at the airport. However, the service marketing literature indicates disparities in conceptualizing or implementing AOQ (Mansor et al., 2012; Pollack, 2009; Zidarova & Zografos, 2011).

Airport Outcome Quality (AOQ) pertains to the deliverables received by the passenger due to utilizing the service (Wu & Cheng, 2013). AOQ focuses on evaluating the service outcome, especially concerning the benefits that passengers derive from the service. It aims to determine

if the AOQ effectively meets the needs and desires of passengers (Mansor et al., 2012; Wu & Cheng, 2013). Waiting time (WT), Airport tangibles (AT), and Valence (VL) are the reflective dimensions of the airport outcome quality (Mansor et al., 2012; Wu & Cheng, 2013). Waiting time is designated as an integral component of passenger evaluation. For example, WT in passenger service is generally considered a waste of time for customers. This factor predicts a positive relationship; greater acceptance of WT is associated with a greater acceptance of AOQ (Brady & Cronin, 2001; Mansor et al., 2012). When passengers have to wait long, they become dissatisfied with the service provided. VL refers to passengers' evaluations after consuming a service to determine if the outcome meets their expectations (Ko & Pastore, 2005)

On the other hand, valence focuses typically on the assumption that the attributes determine whether passengers recognize the service results (Brady & Cronin, 2001; Pappachan, 2020; Wu & Cheng, 2013). This is regardless of how passengers evaluate other aspects of the experience. According to studies, the AOQ plays a crucial role in determining PS because it provides the standpoint for service delivery. AOQ significantly contributes to passengers' overall satisfaction with an airport (Fodness & Murray, 2007; Mansor et al., 2012).

Studies support a connection between AOQ and PS. However, these relationships provide conflicting results (Brady & Cronin, 2001; Fodness & Murray, 2007; Halpern & Mwesiumo, 2021; Wu & Cheng, 2013). Consequently, The airport servicescape (ASC) is considered a moderating variable amongst AOQ and PS since it has the regulatory capability (Jani & Han, 2015; Smith, 2018). Prior research has demonstrated that the airport servicescape has been understudied in the existing body of knowledge (Batouei et al., 2020; Soe, 2022). This study significantly enhances the current knowledge by focusing on the HSQM with the SOR theory in the airport setting. Practitioners may acquire a better understanding of how airport servicescape improves passenger satisfaction. Moreover, the results of this current study may be used by policymakers, specifically airport authorities, to develop policies that address passenger satisfaction issues for service quality enhancement. The following sections cover the empirical review, literature review, development of hypotheses, conceptual model, methodology, findings, discussion of findings, implications, and area and directions for future research.

Literature

Theoretical Framework

Service quality is a powerful tool for recognizing and assessing consumer needs, wants, and opinions regarding services (AŞIK, 2019; Bakır et al., 2022). Various theories and models have been examined and used in previous studies, including the Hierarchical Service Quality Model (HSQM), Evaluation Congruity Theory, the Expectancy Disconfirmation theory (EDT), the SERVQUAL model, Value Precept Theory, the Stimulus Organism Response (SOR), Performance Importance theory, Dissonance Theory, Contrast Theory, Attribution Theory, Equity Theory, Comparison Level Theory, and Person Situation Fit model (Ghotbabadi et al., 2015; Yüksel & Yüksel, 2008). For this study, two models were chosen as the basis for this research notably the Hierarchical Service Quality Model (HSQM) and Stimulus-Organization-Response (SOR) theory, which have recently gained the most acceptance among marketing and consumer behaviour researchers (Wiredja et al., 2019b; Wu & Cheng, 2013) in explaining consumer satisfaction in the context of airport.

The Hierarchical Service Quality Model (HSQM) was developed by Brady and Cronin (2001) as a comprehensive and multi-level framework that explains customer satisfaction. It encompasses three fundamental high-order constructs: outcome quality, interaction quality, and environment access quality. This model helps service organizations identify issues at different levels of service delivery (Brady & Cronin, 2001; Mansor et al., 2012; Wu & Cheng, 2013). As mentioned above, the model facilitates the identification of passenger wants and service deficiencies across several operational levels, enabling managers to improve the perceived service quality and passenger experiences by providing high-quality services.

This model shows an enhanced understanding of how passengers perceive service quality (Pollack, 2009). This approach overcomes limitations of the standard and SERVPERF and SERVQUAL models and offers a more precise way to evaluate the quality of the service delivery in the airport field. The hierarchical component has a solid structure and precisely specifies the customer-perspective factors (Wu & Cheng, 2013). In addition, hierarchical measurement disregards service outcomes in earlier models like SERVQUAL and SERVPERF.

Other researchers have confirmed the model's validity and dependability in various contexts (Bezerra & Gomes, 2016; Yang et al., 2015). Results indicate that the hierarchical instrument is the most practicable method for assessing service quality (Pollack, 2009; Wiredja et al., 2019a). Halpern and Mwesiumo (2021) say that service quality is established by its efficacy in a particular environment for specific service features. In contrast, passenger satisfaction is measured by satisfaction with service (Wu & Cheng, 2013). This model's fault lies in its failure to incorporate the interconnections between service quality and other models or theories like environmental psychology (Brady & Cronin, 2001; Wiredja et al., 2019a; Zidarova & Zografos, 2011); according to this view, SOR theory employed to complement the shortcoming of the HSQM.

This study utilized the SOR theory to evaluate the moderating capability of three servicescape attributes' environmental and psychological effects on passengers (ambient, design, and signs) within an airport setting to enhance passenger satisfaction responses. The SOR has a psychological nature that can evaluate satisfaction response when a passenger enters a pleasant/unpleasant environment. The SOR theory is rooted in environmental psychology and is the theoretical foundation for comprehending consumer behaviour (Russell & Mehrabian, 1974). According to Floh and Madlberger (2013), A stimulus affects individuals' internal emotional assessments, resulting in approach behaviour. According to Jacoby (2002), A servicescape visitor's instant response is the stimulus. ASC affects PS psychologically when a passenger enters a specific environment setting (Yang et al., 2015). Academic research has extensively employed the SOR theory to investigate the correlation among stimulus (inputs), organism (process), and response or satisfaction (outputs). SOR theory illustrates how servicescape stimuli affect emotional and behavioral responses. Various emotions (e.g., pleasure) are evoked by various artificial environmental stimuli (e.g., design, color, light, music, and aroma). The airport servicescape was added as the moderator to enhance passenger satisfaction, as empirically demonstrated by applying the SOR theory.

Furthermore, it is essential to point out that the stimuli elicited cognitive processes encompassing perception, knowledge acquisition, and customer thinking. Previous studies

have been undertaken on servicescape, employing the SOR theory as a framework (Bitner, 1992; Şahin & Kılıçlar, 2023; Wu et al., 2021).

Hypotheses Development

Trends in the airport industry indicate that airports are eager to develop facilities and tangibles with innovative technological developments that streamline passenger processing procedures to enhance service quality (Chike & Stephens, 2021). To adapt to the evolving preferences of airport travellers, it is imperative to remain abreast of shifting priorities. In contemporary times, comprehensive knowledge of various dimensions of outcome quality has become crucial for airport management and operators. Specifically, understanding the expected outcome and perceptions of air passengers, as well as identifying the major elements that exert an effect on their satisfaction, is crucial in enhancing the overall passenger experience (Adeniran & Fadare, 2018; Akter et al., 2010; Lamb et al., 2020; Pappachan, 2020; Zidarova & Zografos, 2011).

AOQ dictates customers' benefits from a service and typically impacts service delivery outcomes (Smith, 2018; Wu & Cheng, 2013). The three attributes that contribute to passenger satisfaction with AOQ are airport tangibles (AT), waiting time (WT), and valance (VL) (Brady & Cronin, 2001; Wu & Cheng, 2013). For instance, waiting too long is widely recognized as an unproductive use of passengers' time (Bezerra & Gomes, 2016). Passengers are dissatisfied with the service rendered when subjected to prolonged waiting time (Chike & Stephens, 2021). Existing information in service marketing literature indicates variations in the application of the AOQ (Bezerra & Gomes, 2016; Wu & Cheng, 2013). Several studies suggest that the AOQ of ASQ is an essential dimension of PS as it affects both negatively and positively. Some studies support positive relationships (Bezerra & Gomes, 2020; Halpern & Mwesiumo, 2021), and those in support of negative relationships (Wu & Cheng, 2013). Several variables affect airport passenger satisfaction (Greve, 2014). Conversely, Seetanah et al. (2020) identified a negative influence between outcome quality and passenger satisfaction. Hence, the current study hypothesized that:

H1: *There is a positive influence between airport outcome quality and passenger satisfaction.*

Smith (2018) stated that ASC dimensions, including layout, ambient conditions, and clear signs, can improve passenger satisfaction. To enhance passenger satisfaction, signage must be effective in scope, accessibility, and correctness (Brida et al., 2016; Smith, 2018). Numerous scholars have conducted studies highlighting the significance of servicescape in assessing customer service quality (Smith, 2018). Numerous scholars have conducted studies highlighting the importance of servicescape for evaluating airport service quality (Alfakhri et al., 2018). The concept under consideration encompasses three distinct aspects: ambient, spatial and functional layout, and design elements such as symbols, signs, and artifacts (Bitner, 1992; Moon et al., 2016; Park & Ryu, 2019).

The ASC affects how passengers are satisfied with the services delivered by a particular airport (Lee & Yu, 2018). Layout, ambient lighting, and prominent signage are airport servicescape elements that can enhance passenger satisfaction. This is particularly true in an airport context, where accurate and clear signage is essential (Wattanacharoensil et al., 2022). The idea of the airport servicescape was used as a moderator in this study. This research looked at how the

airport's outcome and passengers' satisfaction were affected by the regulatory effects of environmental factors, spatial design and functioning, and servicescape signs, symbols, and artefacts (Bitner, 1992; Moon et al., 2016; Park & Ryu, 2019). Aesthetic and fu

nctional aspects of the servicescape are contained in ambient conditions, which are background conditions related to design factors (Moon et al., 2016; Smith, 2018). All the seats, aisles, hallways, walkways, dining paths, restrooms, entrances, and exits that make up an airport are parts of its spatial layout and functional design (Moon et al., 2016). Artefacts, signs, and symbols can be either overt or covert elements of our environments that communicate with humans visually or symbolically; these cues help us make sense of our surroundings and figure out how to engage with them (Moon et al., 2016; Taheri et al., 2020). According to Smith (2018), servicescape favors passengers' satisfaction when using an airport. There have been tests of the servicescape's moderating impacts in different settings, like casinos and hotels (Jani & Han, 2015; Lee & Yu, 2018; Taheri et al., 2020)

According to this research, AOQ and PS are moderated by the servicescape. Therefore, it is hypothesized in this study that:

H_2 *There is a moderating effect of airport servicescape on the airport outcome quality and passenger satisfaction*

Methodology

Data

This paper is based on the ontology of objectivism and seeks to verify a theory (Ragab & Arisha, 2018; Saunders et al., 2019) and hold fast to the positivist view of knowledge that the truth is waiting to be found (Ragab & Arisha, 2018; Saunders et al., 2019). This study utilized a cross-sectional design because of budget and time limitations. In 2019, the United Republic of Tanzania reported that 1,649,500 international passengers travelled through the country's international airports. (URT, 2019). This figure was distributed among three airports as follows: Julius Nyerere International Airport (JKIA) accounted for 966,800 passengers, representing 58.6% of the total; Abeid Amani Karume International Airport (AAKIA) served 416,600 passengers, accounting for 25.3% of the total; and Kilimanjaro International Airport (KIA) handled 266,100 passengers, making up 16.1% of the total population (URT, 2019). Thus, 1,649,500 participants (N=1,649,500) made up the research population.

In this study, the sample size was determined using the Yamane formula, which is stated as follows: $n = N / [1 + N (e)^2]$, in which N= population of the study, n = sample size, e = the acceptable sampling error (Yamane, 1967). In light of the study's rationale, we allowed a 95% confidence interval and estimated a 5% margin of error. Most studies aim for a 95% confidence interval, which means that out of 100 random samples, at least 95% would be representative of the population of interest (Saunders et al., 2016). Since the sample size is 400, as obtained from the Yamane formula, the proportion of each international airport was calculated as 235 questionnaires distributed at JNIA, 101 at AAKIA, and 64 at KIA. Nevertheless, out of the 390 surveys gathered, 11 (or 2.8% of the total questionnaire) were eliminated because they contained more than 15% missing data (Hair et al., 2017; Pallant, 2020). Responses were thus collected from 379 surveys (91.2%).

Researchers used convenience sampling to pick study participants from the target population based on their availability, willingness to participate, and other practical considerations. (Etikan et al., 2016; Saunders et al., 2012). Convenience sampling is used in qualitative and quantitative analyses to collect data from easily accessible people. Quantitative studies use it most often (Etikan et al., 2016). The primary premise of convenience sampling is that the population of interest is homogeneous (Saunders et al., 2012). International travellers boarding flights out of Tanzania's three major airports provided information regarding their experience there.

Two academics with service marketing expertise and two airport service delivery specialists received the questionnaire. A redesigned questionnaire was created using all of the reviewers' recommendations, and 50 international passengers participated in pilot research from Julius Nyerere International Airport. Pilot study data were analyzed and input integrated into a final draft questionnaire. A researcher approached passengers in the airport lounge after clearing check-in and passport control/security and asked if they would mind filling out a survey.

Operationalization of the Variables

The independent variable was adopted from (Brady & Cronin, 2001), who believed airport service quality had three levels: engagement, access, and outcome. Airport outcome quality was a higher-order construct based on waiting time (WT), airport tangible (AT), and valence. Based on their airport experiences, respondents rated airport result quality elements on a seven-point Likert scale. Positive perceptions of waiting time are linked to improved outcome quality, which has been recognized as a crucial component of the overall assessment of travellers (Bogicevic et al., 2013; Wu & Cheng, 2013). Valence is the primary feature that decides if customers are satisfied with the final service (Brady & Cronin, 2001; Wu & Cheng, 2013). Airport Servicescape (ASC) served as a moderator in this study. A validated 7-point Likert scale, considered more effective as a moderating variable than scales with fewer points, was also used for assessment (Memon et al., 2019).

Passenger satisfaction (PS) was conceptualized as a low-order construct measured with four items; PS is achieved by providing the optimum level of services that passengers expect, particularly the highly-valued ones (Zidarova & Zografos, 2011). This was assessed using validated scales utilizing a seven-point Likert scale, with 1 representing strongly disagree and 7 representing strongly agree. It was operationalized as a dependent variable (Brady & Cronin, 2001; Wu & Cheng, 2013).

Results

Demographic statistics

The sample's descriptive statistics were 56.2% males and 43.8% females. The sample comprised 12.1% of respondents with certificate education, while 11.1% had a diploma, 44.6% had a bachelor's degree, 2.61% had a postgraduate diploma, 27.2% had attained education to master's degree level, and 2.4% had a doctorate. Furthermore, intercepted passengers revealed that 23.5% were at the age 55 and above, 41.2 % were in the age range between 45-54, 12.9% of passengers with aged between 34 and 44, 12.7% were aged between 25 and 34, and 9.8% were at the age between 15 and 24. Results also showed that 34.8% were first-time passengers who travelled through airports, 55.7% of passengers travelled 2-3 times, and 9.5% used the

airport 4 times or more. This implies that most international travellers who travel to these airports have experienced a variety of services offered.

Data Screening

Structural equation modelling research requires data screening. Using SEM requires careful data gathering and assessment. This SEM requires quantitative data, primarily primary data. The researcher guarantees that the data satisfies the criteria of the analysis technique by overcoming the obstacles of the research instrument (Hair et al., 2017).

Hair et al. (2010) outline that data analysis becomes relatively simple once a clean data collection is obtained. Of the 400 distributed questionnaires, 390, equal to 91.2%, were returned, and 11 were removed (379 remained). From descriptive analysis, only 8 cases were removed from the data set due to the missing data, and 3 cases with suspicious response patterns were observed and removed from the data set. Due to a mistake in the data entry, two outliers were noticed and corrected. Finally, researchers followed the advice of experts and examined the possibility of common technique bias (Hair et al., 2017; Pallant, 2020).

Measurement Model Evaluation

The research employed SmartPLS3 software to conduct partial least squares structural equation modelling (PLS-SEM) (Ringle et al., 2015). It is necessary to evaluate the construct and indicator levels of measure reliability (including internal consistency, construct, and indicator reliability) while evaluating reflective measurement models (Becker et al., 2023; Matthews et al., 2018; Ringle et al., 2015). The convergent validity of each measure is the primary focus of validity evaluation when employing the extracted mean-variance (AVE). Furthermore, one can effectively test the discriminant validity of a reflectively assessed concept by comparing the heterotrait-monotrait (HTMT) correlation ratio with other construct measures within the same model. This study measures AOQ and ASC as second-order components and PS as first-order components. Researchers can model a construct more abstractly using second-order constructs, such as the hierarchical component model in the PLS-SEM, to reduce model complexity (Becker et al., 2023; Hair et al., 2017). Using higher-order constructs has multiple advantages, as stated by Sarstedt et al. (2019); these include making PLS route models more straightforward, resolving accuracy inconsistencies, and reducing collinearity problems (Becker et al., 2023).

Studies have used a disjoint two-stage approach as an alternative to the repeated indicators approach in the partial least square path model (Becker et al., 2023; Wetzels et al., 2009). Two steps were taken to analyse this reflective-reflective second-order. The first and second stages' measurement model was evaluated as the requirement (Becker et al., 2023; Hair et al., 2017; Wetzels et al., 2009). Table 1 displays the results for first-order and second-order reliability and convergent validity.

The items below 0.5 of their factor loadings were removed (Hair et al., 2017; Henseler et al., 2015). Only item AC5 with loading 0.47 was removed from the model for this study. All composite reliability ratings for lower- and higher-order constructs were more than 0.7, as shown in Table 1, suggesting that the underlying constructs were internally consistent (Hair et al., 2017). Convergent validity was attained because all of the average variance extracted (AVE) values for the higher-order and lower-order constructs were larger than 0.5, as shown

in Table 1. This means that each construct explains more than 50% of the variation of its indicator (Hair et al., 2017).

Table 1: Construct Validity and Reliability

1st Order Construct	Items	FL[a]	CR[b]	AVE[c]	2nd Order Construct	CR[b]	AVE[c]
Airport Tangibles (AT)	AT1	0.724	0.855	0.543			
	AT2	0.791					
	AT3	0.621					
	AT4	0.707					
	AT5	0.826					
Waiting Time (WT)	WT1	0.810	0.843	0.576	Airport Outcome Quality (AOQ)	0.865	0.681
	WT2	0.733					
	WT3	0.637					
	WT4	0.840					
Valence (VL)	VL1	0.779	0.858	0.576			
	VL2	0.698					
	VL3	0.726					
	VL4	0.769					
	VL5	0.727					
Ambient Conditions (AC)	AC1	0.803	0.808	0.515			
	AC2	0.647					
	AC3	0.730					
	AC4	0.681					
Spatial Layout and Functionality (SLF)	SLF1	0.769	0.878	0.591	Airport Servicescape (ASC)	0.860	0.672
	SLF2	0.782					
	SLF3	0.726					
	SLF4	0.778					
	SLF5	0.788					
Signs, Symbols and Artifacts (SSA)	SSA1	0.714	0.835	0.505			
	SSA2	0.716					
	SSA3	0.749					
	SSA4	0.768					
	SSA5	0.594					
Passengers Satisfaction (PS)	PS1	0.890	0.918	0.738			
	PS2	0.843					
	PS3	0.905					
	PS4	0.795					

This study investigated the discriminant validity using the Heterotrait-Monotrait ratio of correlation (HTMT) suggested by Henseler et al. (2015). There are no issues with discriminant validity amongst reflective constructs when the HTMT value is less than 0.85. With a suggested cutoff of 0.90, discriminant validity issues arise with high HTMT values (Sarstedt et al., 2019). Table 2 shows that the greatest HTMT value in this study is 0.734. This means that the discriminant validity of the latent variables is acceptable, which means that the measurement model quality is clear and satisfactory.

Table 2: Heterotrait-Monotrait Ratio of Correlation (HTMT) for Discriminant Validity

	AC	AT	PS	SLF	SSA	VL	WT
AC							
AT	0.197						
PS	0.320	0.641					
SLF	0.686	0.264	0.296				
SSA	0.734	0.210	0.410	0.594			
VL	0.159	0.730	0.651	0.225	0.223		
WT	0.109	0.664	0.564	0.169	0.099	0.621	

Structural Model Assessments

The hypotheses were validated by analyzing the structural model once the measurement model's reliability and validity had been tested (Hair et al., 2019). Before going to the next stage, the VIF (Variance-Inflation-Factor) was calculated to test the multi-collinearity of the model (Kock, 2015). All tolerance values are below the threshold of 3.3, as indicated by the results (Kock, 2015). The direct and moderated hypotheses were tested. The structural model displays the outcomes of hypothesis testing for direct and moderated effects in Table 5. A strong link exists between AOQ and PS. Table 5 shows a significant positive relationship between AOQ and PS ($\beta = 0.627$, $p < 0.001$).

The bootstrap was carried out, specifically looking at the confidence interval for the coefficient estimate (0.567; 0.673), suggesting a significant influence between AOQ and PS. The effect size (*f2*) must be calculated to prove the relationship. Table 5 shows that the f^2 value of 0.646 was acceptable and above the 0.02 minimal requirement. This satisfactory f^2 value demonstrated a substantial relationship between AOQ and PS.

Table 4: Multi-Collinearity Issue: Variance Inflation Factors (VIF)

Hypothesis	VIF	CMB Problem
AOQ → PS	1.044	Not an issue
ASC → PS	1.044	Not an issue

The validity, predictive power, explanatory power and predictive power of the structural model were assessed by calculating the effect size (f^2), coefficient of determination (R^2) and predictive relevance (Q^2 predict) (Hair et al., 2019). As indicated in Table 5, the f^2 value of 0.646, above the small effective size threshold, was considered acceptable. This acceptable value of f^2 suggested that the size or magnitude of the relationship between AOQ and PS has been confirmed to be within the acceptable threshold. An R^2 value of 0.393 suggests that this model has a moderate value of predictive accuracy. More than 39% of the passenger satisfaction was explained by endogenous variables ($R^2 = 0.393$). The path models are relevant and meaningful, as seen below. Table 5 shows that the route model's predictive relevance for each endogenous latent variable is demonstrated by a Q^2 greater than zero.

Additionally, the f^2 value has sufficient predictive relevance, as it exceeds the 0.15 and 0.35 thresholds, respectively (Hair et al., 2019). The results of the structural model are displayed in

Table 5. In order to determine the structural model's prediction accuracy for a specific endogenous construct, Q^2 values are significant if it is greater than zero (Hair et al., 2019).

Table 5: Hypotheses Test Results

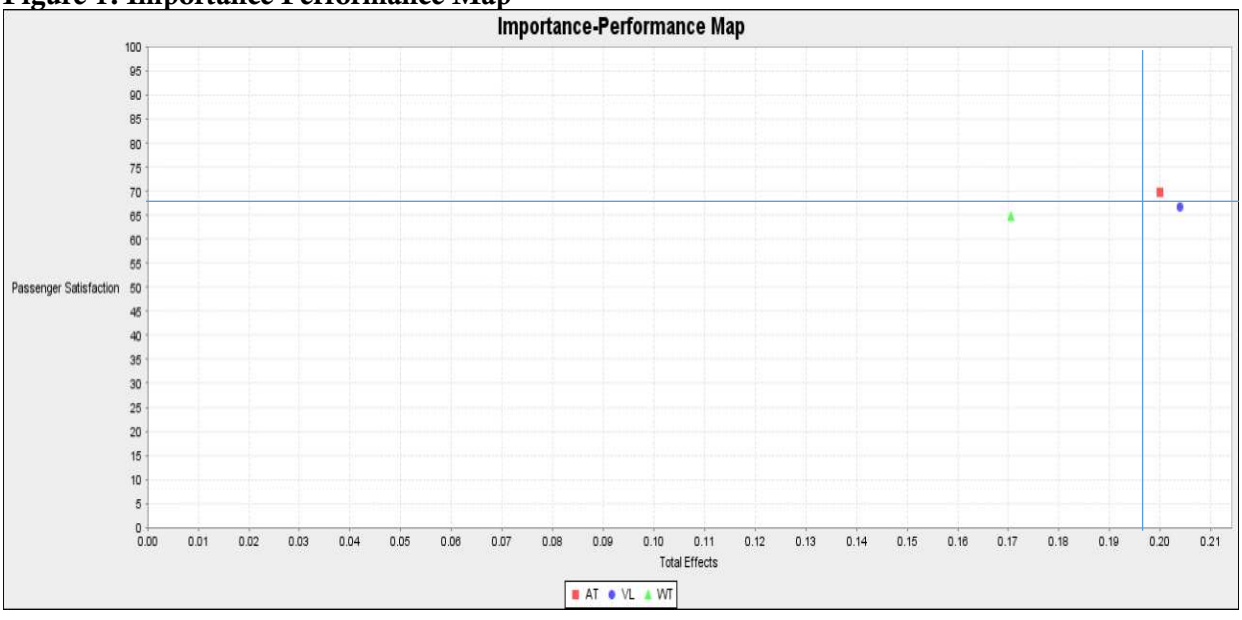
Hypotheses	Std Beta	Std Error	t-value	95% Confidence Intervals	f^2	R^2	Q^2
H1	0.627	0.032	19.821***	[0.567;0.673]	0.646	0.393	0.272
H2	0.106	0.057	1.854 ***	[0.038;0.178]	*N/A*	0.461	0.315

Moderation Analysis

This study examined whether ASC influences the link between AOQ and PS. The PLS product-indicator approach is utilized for moderation analysis in this study (Hair et al., 2017; Ramayah et al., 2018). Hypothesis H_2 aimed to investigate the moderating effect of ASC on the relationship between AOQ and PS. Table 4 indicates that the interaction effect, i.e. (ME -> PS; $\beta = 0.106$, $p < 0.001$), means that this hypothesis is significant and supported. Further, the results of the bootstrapping analysis indicated that the confidence interval [0.038; 0.178] did not include zero, justifying the existence of the moderating effect. Hence, the result implies that airport servicescape moderates the relationship between ASC and PS (ASC*AOQ -> PS). Therefore, there is compliance with H2; thus, the finding suggests a positive moderation effect of ASC on the relationship between AOQ and PS.

The positive coefficient alone cannot determine the amount and precise nature of the moderating impact. Thus, the interaction plot can help explain it (Ramayah et al., 2018). Additionally, it is essential to understand that the R^2 value of the moderation effect (0.461) is stronger than the main effect model R^2 (0.393). The R^2 change by 0.068, equivalent to 6.8% (additional variance), is vital in moderation analysis (Ramayah et al., 2018).

Figure 1: Importance Performance Map



Importance Performance Map Analysis (IPMA)

The IPMA endorses ordering latent variables to enhance particular target constructs (Ringle & Sarstedt, 2016; Wyród-Wróbel & Biesok, 2017). Figure 1 illustrates an IPMA conducted at the indicator level to pinpoint specific areas for enhancement. IPMA is beneficial for deriving further insights and conclusions (Ringle & Sarstedt, 2016). Low-order constructs (airport tangibles, waiting time, and valence) were evaluated using the IPMA against the target variable (passenger satisfaction). Airport tangibles show high importance and performance, suggesting that this construct performs well. Valence is shown to be of high importance but has low performance. Also, waiting time shows low performance and low importance.

Discussion

The objective of this study was to examine the influence of airport outcome quality (AOQ) on passenger satisfaction (PS). The study's hypothesis is that: '*There is a significant positive relationship between airport outcome quality and passenger satisfaction';* this is results support the stated hypothesis (H_1). This implies that the higher the airport outcome quality (AOQ) experienced by passengers, the higher the passengers' satisfaction; airport outcome quality was found to have the most significant effect on satisfaction. This study confirmed that for each dimension, airport tangibles including passenger processing machines, luggage carts, and seating arrangements, were found to have more influence on enhancing passenger satisfaction. Furthermore, this study showed that the waiting time of passengers before being was minimal and acceptable. This result is similar to prior studies (Balinado et al., 2021; Bezerra & Gomes, 2016; Wu & Cheng, 2013). The use of the same methodologies caused these similarities. The valence of specific features dictates whether a passenger views a service outcome as positive, moderate or negative, independent of other considerations. However, this study also found moderate valence in international airports in Tanzania, which means that the hedonic emotional characteristics of passengers were minimal in relation to different services received at the three international airports in Tanzania.

The theoretical and conceptual basis for airport outcome quality, airport servicescape and passenger satisfaction established. This study also promotes the use of the Hierarchical Service Quality Model (HSQM) in this airport context, especially in developing nations. However, some researchers (Bezerra & Gomes, 2020); Prentice and Kadan (2019) argue that It is crucial to understand how each aspect of airport outcome quality impacts results connected to passenger satisfaction.

Caro and Garcia (2008) argued that passengers' views on a are impacted by visible evidence. This study verified that the physical aspects of airports mainly impact the airport outcome quality. Therefore, it is a crucial element in ensuring PS. Moreover, this study demonstrated that the wait time before being served impacts the evaluation of PS. This study emphasized the significance of valence due to its high loading, and these results are consistent with the existing literature (Brady & Cronin, 2001; Caro & Garcia, 2008; Wu & Cheng, 2013).

Airport servicescape moderated airport outcome quality and passenger satisfaction, according to hypothesis two (H_2). This study provided solid evidence that airport servicescape is a significant moderator, as it supported prior studies on the importance of servicescape (Han & Hyun, 2018; Smith, 2018). Furthermore, airport authorities should prioritize servicescape

operations (e.g., appealing decor, comfy seats, interior design and good furniture). Servicescape layout and mood (light, color, and aroma) are managed by management. This means that passengers prefer a modern and impressive airport servicescape. The airport servicescape strengthens the relationship as the hypothesis shows how ASC affects PS. This research objective was addressed using a deductive approach, whereby direct and interaction hypotheses were developed relying on the theoretical foundation of the Hierarchical Service Quality Model (HSQM) and Stimulus Organism Response (SOR) theory and empirical studies. The findings of the study indicate that the relationship between airport outcome quality and passenger satisfaction was positive and significant; this relationship was also moderated.

Furthermore, as the methodological stance, this study used two disjoint methods and PLS-SEM in SmartPLS3 to analyze reflectively higher-order constructs, which have received less attention in prior studies. The study helps partial least square investigations, especially those using higher-order components, in which the repeated indicators approach was used before. This study employed PLSpredict to evaluate out-of-sample predictions and predict future outcomes. The model must be estimated on a training sample without the expected cases to make out-of-sample predictions (Shmueli et al., 2019). The application of PLSpredict in this study makes the study unique because this was the void of the previous research.

This study has many practical and managerial implications for the Tanzania Airport Authority (TAA) and Zanzibar Airport Authority (ZAA) administration and staff. Firstly, the airport authorities must also continue to conduct passenger handling-related training, especially for the airport staff who handle passengers directly for them to better understand the passenger needs and expectations as demonstrated by low valence variable from this study, with training can better understand their client's needs, wants, and emotions making them feel at ease and leaving them more satisfied. Secondly, airport management should maintain the factors that show high acceptance, such as airport tangibles and minimal waiting time; as they demonstrated to be important for passengers to use, comfortable and well-arranged airport facilities, including seats at the waiting lounge, again, the study shows that air passengers they happy when they spend minimal waiting time at different services received at airports in Tanzania. Lastly, airport authorities must continue to improve the airport servicescape as an artificial environment because it has confirmed from this study to enhance passenger satisfaction.

Conclusion

Outcome quality plays an important role in passenger satisfaction, particularly in the airport context. The study examined how airport outcome quality affects passenger satisfaction at international airports in Tanzania. The findings revealed that there is a significant effect between airport outcome quality and passenger satisfaction. This study generally adds something new to the body of knowledge, especially airport service quality studies. Since airport outcome quality shows the great effect on passenger satisfaction, furthermore, airport servicescape moderated this relationship, this prompts airport designers and architecture to develop more impressive airport designs as it demonstrated by this study to enhance passengers' satisfaction. Despite the wealth of airport service quality research, this study made two significant theoretical contributions. Firstly, applying high-order constructs in the airport

context was important because the previous studies had limited attention. Secondly, the Hierarchical Service Quality Model and Stimulus Organism Response were integrated to examine the airport outcome quality and passenger satisfaction under the airport servicescape. This study also has limitations that need more studies; future studies may examine the remaining factors of the Hierarchical Service Quality Model, such as access and interaction quality, which were not included in this study. This study focused on departing international passengers; other studies may consider arriving international passengers. Again, this study used cross-sectional, but future studies may use longitudinal methods to establish the correct sequence, identify changes over time, and gain insight into passenger perception changes.

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