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Passengers' Satisfaction with Airport Service Quality: Insights from Julius Nyerere International Airport in Tanzania

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Abstract

This study aimed to investigate the impact of airport service quality on passenger satisfaction at Julius Nyerere International Airport in Tanzania. The Hierarchical Service Quality Model was adopted to meet the study objective. A quantitative approach using convenience sampling and 335 samples was employed. Data were collected through a closed-ended questionnaire. Questionnaires were distributed to departing international passengers and collected after completion at Julius Nyerere International Airport in Tanzania. Responses from respondents based on a seven-point Likert Scale and the data were analysed using Confirmatory Composite Analysis and Partial Least Squares -Structural Equation Modelling with the help of Smart PLS 4 software. The study confirmed that passengers' satisfaction is positively influenced by airport service quality. Furthermore, airport service quality is deeply rooted as an influential predictor of passenger satisfaction. The study makes a practical contribution to Airport authorities and operators by emphasizing the significance of airport service quality in enhancing passenger satisfaction levels.

***Keywords*:** Passenger Satisfaction; PLS -SEM; Hierarchical Service Quality Model.

Introduction

Airports are critical areas that require specific facilities, formalities, and procedures to handle air transport operations effectively (Kankaew, 2020). Well-designed airport infrastructures play a significant role in attracting passengers and enhancing their satisfaction (Saut & Song, 2020). Many airports now feature shopping centres and movie theatres, providing passengers with opportunities to shop and enjoy entertainment while waiting for their flights (Bezerra & Gomes, 2020). Typically, due to the extended waiting periods before flights, passengers participate in a variety of procedures and discretionary activities within the airport terminal (Prentice & Kadan, 2019). From the passenger's perspective, airport terminal activities can be categorized into two main types: processing activities, which include restricted tasks such as check-in, immigration, and security screening, and non-processing or discretionary activities, which consist of unrestricted options like shopping, dining, resting, and currency exchange (Bezerra & Gomes, 2016; Saut & Song, 2022). Research indicates that passengers spend approximately 20% of their time on processing activities and 80% on discretionary activities during their time at the airport terminal (Wattanacharoensil et al., 2016).

Airports are increasingly resembling shopping paradises, offering a variety of trendy and duty-free merchandise (Saut & Song, 2022). Studies have shown that providing a diverse range of goods and services, including food and beverages, clothing, and souvenirs, has a significant impact on passenger satisfaction. The quality of airport service, bolstered by improved infrastructure, is a primary motivator for passengers (Bezerra & Gomes, 2020; Saut & Song, 2022). The air transport industry has experienced considerable changes, marked by growth in both passenger and cargo traffic (Bezerra & Gomes, 2020). Airports Council International (ACI) projects a 5.2% annual growth in global air traffic until 2029 (Hussain, 2010; Sgueglia et al., 2018).

In East Africa, recent reports indicate passenger arrivals of 1.951 million in Kenya, 1.932 million in Uganda, and 1.808 million in Tanzania (KCAA, 2024; TCAA, 2024; UCAA, 2024). Between 2010 and 2019, the total number of passengers in Tanzania rose by 88.2%, increasing from 3.2 million to 6.2 million (Prakash & Barua, 2016). This substantial growth is attributed mainly to the leisure and tourism sector, as well as innovations in the travel industry (Prakash & Barua, 2016). Most international airports in developing countries appear to lag behind those in developed countries, as demonstrated by annual airport rankings conducted by the Airport Council International (ACI). This study assesses airport service quality at Julius Nyerere International Airport (JNIA) in a developing country setting.

Literature Review

This section provides a comprehensive review of theoretical models and empirical studies examining the relationship between airport service quality and passenger satisfaction.

Theoretical Framework

This study employs the Hierarchical Service Quality Model (HSQM), developed by Brady and Cronin (2001), as a framework for evaluating service quality at airports. This model addresses the limitations of previous service quality models and provides a holistic view of the customer experience across various dimensions and service levels (Bezerra & Gomes, 2016). By employing the HSQM approach, the study identifies certain shortcomings in the traditional SERVQUAL and SERVPERF models (Bezerra & Gomes, 2016). The robust framework of the HSQM, along with its clear definition of customer-centric criteria, makes it a more effective tool for assessing service quality within the airline industry.

Additionally, the hierarchical measurement outlined in this model accounts for service outcomes that were not considered in SERVQUAL. Numerous researchers have established a link between passenger satisfaction and service quality (Bezerra & Gomes, 2020; Tahanisaz, 2020). Various theories and models have been utilized to investigate this relationship. However, many theories applied in service quality studies to explain customer satisfaction are based on first-order variables. In contrast, this study employs second-order constructs that encompass a broader range of variables, allowing for the identification of issues across different levels of airport operations.

Empirical Review and Hypotheses Formulation

Numerous studies have demonstrated that airport service quality (ASQ) is a crucial factor influencing passenger satisfaction (PS) (Adeniran & Fadare, 2018; Bezerra & Gomes, 2016; Bogicevic et al., 2013; Bezerra & Gomes, 2020). Additionally, Saut and Song (2022) emphasized the importance of evaluating airport users' perceptions to enhance airport service quality and meet passenger expectations. Passenger behaviour and expectations can also vary based on the type of traveller, their circumstances, and the purpose of their travel. Various satisfaction studies have utilized different evaluation methodologies. For instance, Mtafya and Mutalemwa (2024) employed the Airport Quality Service Model developed by the Airport Council International (ACI), while Saut and Song (2022) used the Theory of Planned Behaviour (TPB) to explain passengers' intentions regarding their destination visits.

Airport Interaction Quality and Passenger Satisfaction

The Airport interaction quality (AIQ) refers to the interactions between airport staff and passengers during service delivery (Wu and Cheng). It is determined by the extent of satisfaction expressed by passengers on the services provided by airport staff (Bakır et al., 2022; Wu & Cheng, 2013). Passengers expect that their needs at the airport will be met with delight and courtesy by qualified personnel (Bakır et al., 2022). Intensive interaction between frontline airport personnel and passengers characterizes the services (Gouthier & Rhein, 2011; Tahanisaz, 2020). The airport staff's motivation to address passengers' challenges has a favourable impact on passenger satisfaction (Balinado et al., 2021). Airport staff gain profound insight into passengers' wishes, needs, and problems through interaction. The sub-dimensions of airport staff attitude, behaviour, and expertise in interaction quality are vital influencers of passenger satisfaction (Brady & Cronin, 2001; Wu & Cheng, 2013).

Airport service quality encompasses numerous interactions between passengers and airport staff, where employees strive to enhance the airport's image and shape passengers' perceptions (Pappachan, 2020). The service quality of airports likely influences a passenger's decision to return to the destination and constitutes both the initial and final impressions of their journey (Prentice & Kadan, 2019). For example, airport staff should smile while interacting with passengers, which results in passenger satisfaction and a positive impression (Trischler & Lohmann, 2018). A study conducted by Shah et al. (2020) found a favourable and significant relationship between interaction quality and customer satisfaction. Bezerra and Gomes (2016) asserted that passenger satisfaction is affected by the quality of involvement at the airport, particularly when airport staff are involved in resolving issues. In a service setting, perceptions of service quality occur at multiple levels. Several researchers have highlighted the importance of airport interaction quality in influencing passenger satisfaction and identified it as having the most significant impact on perceptions of service quality, either positively or negatively (Bezerra & Gomes, 2016; Halpern & Mwesiumo, 2021; Wu & Cheng, 2013). Again, the primary concern is determining whether these established relationships are negative or positive, as passengers and staff interact closely within the airport environment, and this factor is crucial to passenger satisfaction. Therefore, it is hypothesized that:

H1: Airport interaction quality has a positive influence on passenger satisfaction.

Airport Outcome Quality and Passenger Satisfaction

Airport outcome quality (AOQ) affects the service delivery outcome and incorporates consumer benefits (Wu & Cheng, 2013). It denotes the benefits that passengers obtain from the service, comparing whether the service meets their requirements and desires (Wu & Cheng, 2013). Researchers have demonstrated that aspects of AOQ, including waiting time, tangibility, and valence, make a superficial contribution to passenger satisfaction (Brady & Cronin, 2001; Wu & Cheng, 2013). Minimizing waiting time during airport processing activities increases passenger satisfaction levels (Prentice & Kadan, 2019). Spending a lot of time waiting in lineups hurts their view of the quality of airport services. For example, passengers frequently perceive waiting in lines as an unproductive use of their time, which worsens their level of satisfaction (Gopal Vasanthi et al., 2023). Similarly, tangibles, being amongst the aspects of AOQ, involve airports' physical resources, including furniture and seats, which facilitate passenger service (citation is required). Better service is proportional to the quality of tangible facilities available at the airport (Bezerra & Gomes, 2020). The appearance of supporting equipment used in the service to save passengers has the potential to make a lasting impression on passengers. The influence of the outcome quality component of service quality on passengers' overall satisfaction has been demonstrated in several studies (Bezerra & Gomes, 2016; Caro & Garcia, 2008; Wu & Cheng, 2013).

Additionally, evidence suggests that when customers are presented with multiple services, overall satisfaction is more significantly influenced by process dimensions than by outcomes (Howat & Assaker, 2013). The primary objective of airport operators is thus to monitor and enhance passenger satisfaction and airport outcome quality. Aspects such as extended queueing times negatively affect passenger satisfaction. The preceding literature supported the subsequent hypothesis.

H2: Airport outcome quality has a positive influence on passenger satisfaction.

Airport Environmental Quality and Passenger Satisfaction

The impact of the physical environment on human behaviour has gained significant attention from both academics and managers in the marketing field over the past few decades (Bitner, 1992; Smith, 2018). Several factors contribute to creating a pleasant environment and delivering excellent service in service settings. These include ambient conditions, spatial arrangement and functionality, as well as the presence of signs, symbols, and artefacts (Batouei et al., 2020; Soe, 2022).

Ambient conditions refer to the background circumstances related to design factors, encompassing both the aesthetic and functional elements of the physical environment (Batouei et al., 2020; Moon et al., 2016). These conditions encompass various physical attributes, including temperature, light, sound, scent, and overall volume. Although they are often invisible and intangible, these factors can engage the five human senses (Moon et al., 2016). The terms "spatial layout" and "functionality" refer to the design and arrangement of seating, aisles, corridors, walkways, food service lines, restrooms, entrances, and exits in leisure service environments (Hong et al., 2020; Moon et al., 2016). Environmental artefacts, signs, and symbols can be either explicit or implicit, conveying information about the environment's proper functioning and influencing customers' perceptions of service outcomes, whether positive or negative (Liou et al., 2011; Moon et al., 2016).

In the context of airports, factors such as layout, ambient conditions, visible signage, and the accessibility and accuracy of signage are particularly crucial for ensuring passenger satisfaction (Brida et al., 2016; Soe, 2022). Additionally, the aesthetic features of airport design can significantly enhance customer satisfaction. The overall ambience, furnishings, and visual appeal of an airport environment play a key role in shaping customers' evaluations of its quality (Alfakhri et al., 2018).

Beyond providing adequate service, airport operators have begun to consider artificial physical and atmospheric elements as important factors in enhancing traveller satisfaction (Moon et al., 2016). Research has consistently indicated that the airport's physical environment is one of the most critical elements in evaluating customer service. Most studies have focused on three main characteristics or dimensions: ambience, spatial arrangement, functionality, design, and the presence of artefacts, signs, and symbols (Bitner, 1992; Brady & Cronin, 2001; Gopal Vasanthi et al., 2023. The physical environment of an airport plays a vital role in enhancing passenger satisfaction (Bogicevic et al., 2013). Technology and exposure to various service attributes allow passengers to differentiate between airports based on their perceptions (Smith, 2018). Therefore, it is hypothesized that:

H3: Airport Environmental Quality has a positive influence on passenger satisfaction

The Conceptual Framework

The conceptual model illustrates the relationship between predictor factors, namely airport interaction quality (AIQ), airport environmental quality (AEQ), airport outcome quality (AOQ), and passenger satisfaction (PS), which has been formulated based on the existing literature. According to The Hierarchical Service Quality Model by Brady and Cronin (2001), airport service quality is a multidimensional construct comprising AOQ, AEQ, and AIQ.

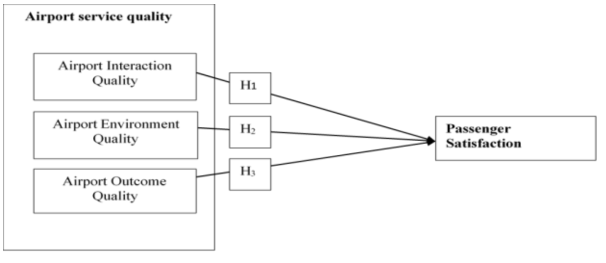

Figure 1: Conceptual framework

Source: Literature review

Research Methodology

This paper is based on the ontology of objectivism and seeks to verify a theory, adhering to the positivist view that truth is waiting to be discovered (Pearlson et al., 2019; Ragab & Arisha, 2018). The data from this study were based on primary data collected from international departing passengers at Julius Nyerere International Airport (JKIA) (URT, 2023). In this study, the sample size was determined using the Yamane formula, which is stated as follows: $n = N / [1 + N (e^2)]$, where N is the population of the study, n is the sample size, and e is 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 & Townsend, 2018). Thus, the sample size is $n = 1{,}649{,}500 / [1 + (1{,}649{,}500 \times 0.05)^2] = 399$. The convenience sampling technique was used to pick study participants from the target population based on their availability, willingness to participate, and other practical considerations (Etikan et al., 2016).

Operationalization of the Variables

The independent variable was adopted from Brady and Cronin (2001), who service quality in three hierarchical levels: interaction, Physical environment, and airport outcome quality. Based on their airport experiences, respondents rated the quality of airport result elements on a seven-point Likert scale (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).

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 one (1) representing 'strongly disagree' and seven (7) representing 'strongly agree'. It was operationalized as a dependent variable (Brady & Cronin, 2001; Wu & Cheng, 2013).

Data Analysis

Data analysis begins with data screening, which helps identify and rectify mistakes, inconsistencies, and missing values. The PLS-SEM method does not necessitate a normality test for quantitative data, especially when dealing with primary data. The researcher must ensure that the data satisfy the criteria of the analytical technique by addressing any limitations of the research instrument, as noted by Hair et al. (2017). When data is properly cleaned, the analysis process becomes much more straightforward. Of the 399 distributed questionnaires, 345 were returned, resulting in a response rate of 86.5%. Out of these, 10 questionnaires were discarded, leaving a total of 335 for analysis. Ten cases were eliminated from the dataset due to missing data, while three cases were removed because they exhibited suspicious response patterns. Additionally, two outliers were identified and corrected due to data entry errors. Finally, researchers consulted experts and examined the potential for standard method bias, as recommended by Pallant (2020) and Sarstedt et al. (2019).

Results

This section presents the demographic profile of the respondents who participated in the study. It highlights key characteristics, including gender, education level, age distribution, and travel frequency. These variables provide important context for understanding patterns of passenger satisfaction and perceptions of airport service quality.

Demographic Statistics

The sample's descriptive analysis revealed that males were the dominant group, comprising 57.2%, while females accounted for 42.8%. Respondents with certificates were 12.1%, diplomas were 11.1%, bachelor's degrees were 47.6%, while 2.6% held postgraduate diplomas, 27.2% had master's degrees, and 2.1% held doctorates. Respondents aged between 15 and 24 were 10.8%, those aged 34 to 44 were 12.9%, those aged 25 to 34 were 11.7%, those aged 45 to 54 were 41.2%, and those aged 55 years or older were 23.5%. According to the findings, 34.8% of passengers travelled through the airports for the first time, 55.7% 2-3 times, and 9.5% 4 times or more. The implication is that most of the passengers have used a variety of services at this airport. Results for the reflective Measurement

Model Evaluation

The study employed SmartPLS 4 software to perform partial least squares structural equation modelling (PLS-SEM) (Henseler et al., 2015). When reflective measurement models, it is required to assess the construct and indicator levels of measure reliability (including internal consistency, construct and indicator reliability) (Becker et al., 2023; Matthews et al., 2018; Ringle et al., 2020; Sarstedt et al., 2019). The extracted mean-variance (AVE) is used to evaluate the convergent validity of each measure. Furthermore, one can successfully test the discriminant validity of a reflectively assessed concept by comparing the heterotrait-monotrait (HTMT) correlation ratio to other construct measures within the same model (Dirgiatmo, 2023).

This study assesses AEQ, AIQ and AOQ as second-order components and PS as first-order components. To reduce model complexity, researchers can second-order structures, such as the hierarchical component model in PLS-SEM (Becker et al., 2023; Hair et al., 2017). According to Sarstedt et al. (2019), using higher-order constructs has numerous benefits, including making PLS route models more transparent, correcting accuracy inconsistencies, and minimizing collinearity issues (Becker et al., 2023). Figure 2. shows the reflective measurement model result, in which all indicators are reflective of first-order constructs.

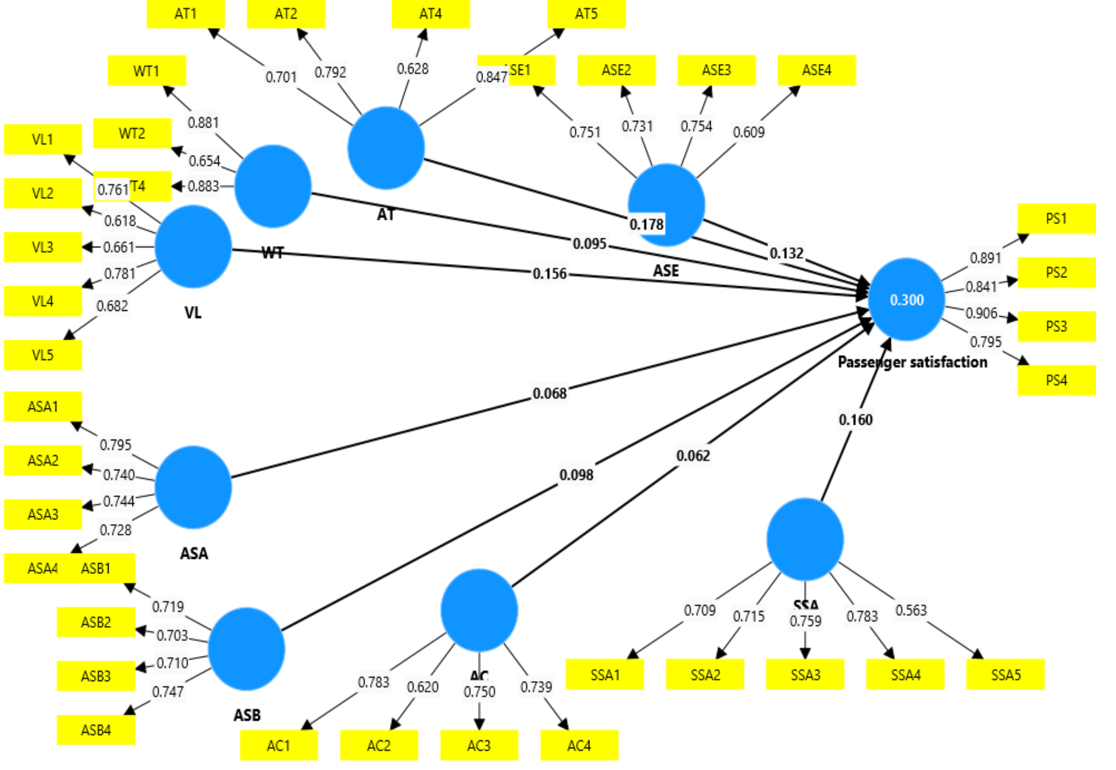

Figure 2: First-order measurement model result

Source: SmartPLS4

Table 1. Convergent validity and Reliability First-Order Construct Outcomes

1st order construct	Items	Loading	CR	AVE
Airport Staff Attitude (ASA)	ASA1	0.795	0.839	0.566
	ASA2	0.740		
	ASA3	0.744		
	ASA4	0.728		
Airport Staff Behaviour (ASB)	ASB1	0.719	0.811	0.509
	ASB2	0.703		
	ASB3	0.710		
	ASB4	0.747		
Airport Staff Expertise (ASE)	ASE1	0.751	0.805	0.582
	ASE2	0.731		
	ASE3	0.754		
	ASE4	0.609		
	SS5	0.751		
Airport Tangibles (AT)	AT1	0.701	0.833	0.558
	AT2	0.792		
	AT4	0.628		
	AT5	0.847		
Waiting Time (WT)	WT1	0.881	0.816	0.535
	WT2	0.654		
	WT3	0.883		
	WT4	0.881		
Valence (VL)	VL1	0.761	0.821	0.598
	VL3	0.618		
	VL4	0.661		
	VL5	0.781		
Ambient Conditions (AC)	AC1	0.783	0.818	0.530
	AC2	0.620		
	AC3	0.750		
	AC4	0.739		
Spatial Layout and Functionality (SLF)	SLF1	0.776	0.881	0.598
	SLF2	0.768		
	SLF3	0.743		
	SLF4	0.809		

	SLF5	0.769		
Signs, Symbols and Artefacts (SSA)	ASA1	0.709	0.834	0.504
	ASA2	0.715		
	ASA3	0.759		
	ASA4	0.783		
	ASA5	0.562		
Passenger Satisfaction (PS)	PS1	0.892	0.918	0738
	PS2	0.841		
	PS3	0.905		
	PS4	0.794		

Source: Field data 2024

The discriminant validity was determined through the Heterotrait-Monotrait ratio of correlation (HTMT), for which the value below 0.90 is recommended (Henseler et al., 2015; Sarstedt et al., 2019). Based on the findings of this study, as indicated in Table 3, the discriminant validity was below 0.9 as recommended, implying that the quality of the measurement model is adequate and explicit. The discriminant validity of the latent variables is acceptable.

Structural Model Assessments

The hypotheses were tested by analysing the structural model once the measurement model's reliability and validity had been tested (Hair et al., 2017). 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 structural model displays the results of hypothesis testing in Table 4. A strong positive link exists between ASQ and PS, as found. Table 5 shows a significant positive relationship between ASQ and PS (β = 0.218, β = 0.246, β = 0.331, $p < 0.001$). Figure 3 illustrates the model of the second-order constructs.

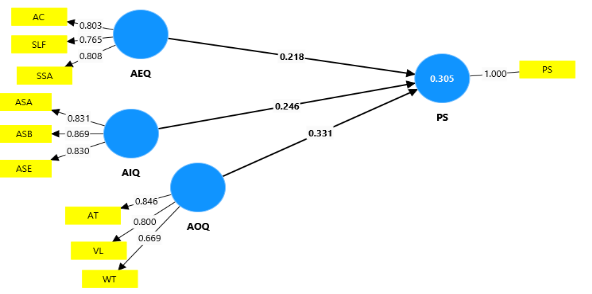

Figure 3: Second-order structural model result
Source: SmartPLS4

The bootstrap was carried out, specifically examining the confidence intervals for the coefficients (0.123; 0.304), (0.146; 0.333), and (0.225; 0.422), which suggest a significant influence between ASQ and PS. The effect size (f2) must be calculated to prove the relationship. Table 4 shows that the f2 value of 0.646 was acceptable and above the 0.02 minimal requirement. This satisfactory f2 value demonstrated a substantial relationship between ASQ and PS.

Table2: Multi-Collinearity Issue: Variance Inflation Factors (VIF)

Hypothesis	VIF	CMB Problem
AIQ ->PS	1.117	Not an issue
AEQ ->PS	1.125	Not an issue
AOQ ->PS	1.241	Not an issue

The validity, predictive power, explanatory power and predictive relevance of the structural model were assessed by calculating the effect size (f2), coefficient of determination (R2), and predictive relevance (Q2 predict) (Hair et al., 2019). As indicated in Table 4, the f2 value of 0.165, above the small effective size threshold, was considered acceptable. This acceptable value of f2 suggests that the size or magnitude of the influence of ASQ on PS is confirmed to be within the acceptable threshold. An R2 value of 0.305 indicates that this model has a moderate value of predictive accuracy. More than 30.5% of the passenger satisfaction was explained by endogenous variables (R^2 = 0.305). The path models are relevant and meaningful, as seen below. Table 4 demonstrates that the route model's predictive relevance for each endogenous latent variable is indicated by a Q2 value greater than zero. Additionally, the f2 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 4. To determine the structural model's prediction accuracy for a specific endogenous construct, the Q2 value is 0.283, which is significant, as it exceeds zero (Hair et al., 2019).

Table 3: Heterotrait-Monotrait Ratio of Correlation (HTMT) for Discriminant Validity

	AC	ASA	ASB	ASE	AT	PS	SLF	SSA	VL	WT
AC										
ASA	0.152									
ASB	0.157	0.781								
ASE	0.325	0.715	0.812							
AT	0.274	0.295	0.266	0.252						
PS	0.291	0.337	0.399	0.409	0.443					
SLF	0.546	0.080	0.109	0.157	0.227	0.273				
SSA	0.664	0.069	0.114	0.147	0.169	0.306	0.513			
VL	0.174	0.259	0.291	0.276	0.674	0.419	0.145	0.191		
WT	0.164	0.259	0.274	0.248	0.519	0.345	0.058	0.089	0.418	

Table 4: Hypothesis Test Results

Hypotheses	Std Error	t-value	95% Confidence Intervals	*f2*	R2	Q2
H1	0.046	4.772	[0.123;0.304]	0.165	0.305	0.283
H2	0.047	5.191	[0.146;0.333]	0.179		
H3	0.050	6.622	[0.225;0.422]	0.240		

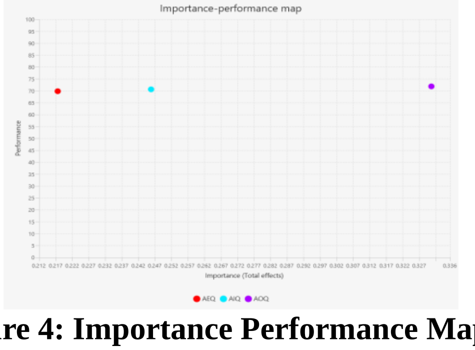

Figure 4: Importance Performance Map
Source: SmartPLS4

Importance Performance Map Analysis (IPMA)

The IPMA suggests that the arrangement of latent variables be implemented in order to enhance specific target constructs (Ringle & Sarstedt, 2016). Figure 3. illustrates an IPMA conducted at the variable level to pinpoint specific areas for enhancement. Further inferences and insights can be derived from

IPMA (Hauff et al., 2024; Ringle & Sarstedt, 2016). The target variable (PS) was evaluated in relation to low-order constructs (AEQ, AIQ, and AOQ) using the IPMA. The excellent execution of airport service quality is indicated by the high importance and performance of its mean values for performance and importance, as shown in Table 5. Airport interaction quality was found to be highly significant, despite its high performance. The character of the airport environment also contributes to poor performance and a low priority.

Table 5: Importance Performance Map for Predecessor of Passenger Satisfaction

Variable	Importance	Performance
Airport Environment Quality	0.218	69.808
Airport Interaction Quality	0.246	70.596
Airport Outcome Quality	0.331	71.845
Mean Value	0.265	70.759

Source: Field data 2024

Discussion of Findings

Airport interaction quality was hypothesized to have a positive influence on passenger satisfaction. The findings supported the hypothesis, whose influence was observed to be significant, implying its existence in real life. Thus, the higher the quality of airport interaction, the higher the level of passenger satisfaction. The results are similar to other studies (Gopal Vasanthi et al., 2023; Stephano et al., 2024). A similar study demonstrates that airport interactions have a substantial impact on overall passenger satisfaction (Farooq et al., 2018). The aforementioned finding regarding airport staff underscores the importance of frontline staff in the context of airport service encounters. It thus has management implications, for instance, the necessity of providing customer service training to the employees. Additionally, it was stated that interaction with airport personnel has a positive impact on service quality.

The findings of the first objective support the assertion that this dimension is crucial to customer satisfaction due to the direct interaction between passengers and service airport staff (Brady & Cronin, 2001; Wu & Cheng, 2013). For example, a study by Wu and Cheng (2013) indicated that a passenger's subjective inclination or disinclination is discernible from their observable actions. The findings align with previous research (Bezerra & Gomes, 2016), which demonstrates a significant beneficial relationship between the quality of airport interactions and passenger satisfaction. The study also supports the application of HSQM in developing countries, specifically in the airport context. Evaluation of the measurement model using the PLS algorithm reveals that all three low-order constructs meet the criteria for reliability and validity. These are airport staff attitude (ASA), airport staff behaviour (ASB), and airport staff expertise (ASE). This result suggests that satisfaction in these areas enhances passenger satisfaction; these findings also align with studies (Al Balushi, 2020; Usman et al., 2022)

The second objective of this research was to determine the extent to which airport environment quality affects passenger satisfaction levels. The findings from the study supported hypothesis number two (H2) by validating that "There is a positive influence of airport environment quality on passenger satisfaction." The empirical findings indicated that the quality of the airport environment has a positive influence on passenger satisfaction. The findings are supported by research from Bitner (1992) and Wu and Cheng (2013), who reported that the physical environment at the airport significantly influences passengers. Likewise, a study by Stephano et al. (2024) supported this study by underlining that the airport physical environment has a substantial impact on how passengers perceive the quality of the service encounter, which in turn affects how satisfied passengers are with the service they receive.

The third objective was to examine the influence of airport outcome quality on passenger satisfaction. The study's conclusions were confirmed. 'There is a significant positive influence of airport outcome quality on passenger satisfaction,' supporting hypothesis three (H3). This implies that the higher the quality of the airport outcome experienced by passengers, the higher their satisfaction; airport outcome quality was found to have the most significant effect on passenger satisfaction. Passenger satisfaction is influenced by waiting time, tangibles, and valence about airport outcome quality. The research findings are similar to those of, who discovered a notable positive impact on the relationship between the quality of airport access and passenger satisfaction. Many studies, including those by Mainardes et al. (2021) and Mainardes et al. (2021) demonstrate that the quality of airport service has a substantial impact on overall service quality as perceived by travellers. The airport service quality indicates what passengers obtain from the service, whether the outcome quality meets the passengers' needs.

Conclusion

The study examined the influence of airport service quality on passenger satisfaction at Julius Nyerere International Airport. The findings revealed a significant effect of airport service quality on passenger satisfaction. This study has made a significant contribution to the body of knowledge by highlighting the hierarchical nature of service quality in the air transport context. Since the application of the hierarchical service quality model shows a significant effect on passenger satisfaction, physical environment quality also has a significant impact. This prompts airport designers and architects to develop more impressive airport designs, as demonstrated by this study, to enhance passenger satisfaction. Despite the wealth of research on airport service quality, this study made two significant theoretical contributions. Firstly, applying high-order constructs in the airport context was important because previous studies had limited themselves to first-order constructs.

Secondly, the study employed two distinct approaches to mitigate the issues of model complexity and collinearity. Again, this study holds significant practical implications for airport authorities in developing nations, including the Ministry of Transport and the Tanzania Airport Authority (TAA). These implications specifically target the management and staff responsible for the authority's operations and services. The developed hierarchical structure enables practitioners to identify the most and least crucial elements that underlie passengers' experiences of service quality. The results of this study suggest that TAA should prioritize enhancing both airport interaction quality and airport outcome quality to deliver excellent service. This framework enables managers to evaluate service quality at various levels, tailored to their reporting needs or the level of specificity required for informed decision-making.

Acknowledgments

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Conflicts of Interest
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References

Ahmadinia, E., Zargar, M., Karim, M. R., Abdelaziz, M., & Ahmadinia, E. (2012). Al Balushi, H. J. (2020). The Role of In-Flight Meal on Satisfaction and Loyalty: A Study of Arabian Gulf Full Service Carriers University of Surrey].

Bakır, M., Akan, Ş., Özdemir, E., Nguyen, P.-H., Tsai, J.-F., & Pham, H.-A. (2022). How to achieve passenger satisfaction in the airport? Findings from regression analysis and necessary condition analysis approaches through online airport reviews. Sustainability, 14(4), 2151. https://doi.org/https://doi.org/10.3390/su14042151

Balinado, J. R., Prasetyo, Y. T., Young, M. N., Persada, S. F., Miraja, B. A., & Redi, A. A. N. P. (2021). The effect of service quality on customer satisfaction in an automotive after-sales service. Journal of Open Innovation: Technology, Market, and Complexity, 7(2), 116.

Becker, J.-M., Cheah, J.-H., Gholamzade, R., Ringle, C. M., & Sarstedt, M. (2023). PLS-SEM's most wanted guidance. International Journal of Contemporary Hospitality Management, 35(1), 321-346.

Bezerra, G. C., & Gomes, C. F. (2020). Antecedents and consequences of passenger satisfaction with the airport. Journal of Air Transport Management, 83, 101766.

Bezerra, G. C. L., & Gomes, C. F. (2016). Measuring airport service quality: A multidimensional approach. Journal of Air Transport Management, 53, 85-93.

Bogicevic, V., Yang, W., Bilgihan, A., & Bujisic, M. (2013). Airport service quality drivers of passenger satisfaction. Tourism Review, 68(4), 3-18. https://doi.org/https://doi.org/10.1108/TR-09-2013-0047

Brady, M. K., & Cronin, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. Journal of marketing, 65(3), 34-49. https://doi.org/https://doi.org/10.1509/jmkg.65.3.34.18334

Caro, L. M., & Garcia, J. A. M. (2008). Developing a multidimensional and hierarchical service quality model for the travel agency industry. Tourism Management, 29(4), 706-720. https://doi.org/https://doi.org/10.1016/j.tourman.2007.07.014

Dirgiatmo, Y. (2023). Testing the discriminant validity and heterotrait–monotrait ratio of correlation (HTMT): a case in Indonesian SMEs. In Macroeconomic Risk and Growth in the Southeast Asian Countries:

Insight from Indonesia (pp. 157-170). Emerald Publishing Limited.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. American journal of theoretical and applied statistics, 5(1), 1-4.

Farooq, M. S., Salam, M., Fayolle, A., Jaafar, N., & Ayupp, K. (2018). Impact of service quality on customer satisfaction in Malaysia airlines: A PLS-SEM approach. Journal of Air Transport Management, 67, 169-180. https://doi.org/https://doi.org/10.1016/j.jairtraman.2017.12.008

Gopal Vasanthi, M., Soundrarajan, V., Nawaz, N., Gajendran, V., & Parayitam, S. (2023). Passenger satisfaction with cleanliness and other service quality dimensions and gender as a moderator: Evidence from Indian Railways. Cogent Business & Management, 10(1), 2183568.

Gouthier, M. H., & Rhein, M. (2011). Organizational pride and its positive effects on employee behavior. Journal of Service Management, 22(5), 633-649.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. International Journal of Multivariate Data Analysis, 1(2), 107-123.

Halpern, N., & Mwesiumo, D. (2021). Airport service quality and passenger satisfaction: The impact of service failure on the likelihood of promoting an airport online. Research in Transportation Business & Management, 41, 100667. https://doi.org/https://doi.org/10.1016/j.rtbm.2021.100667

Hauff, S., Richter, N. F., Sarstedt, M., & Ringle, C. M. (2024). Importance and performance in PLS-SEM and NCA: Introducing the combined importance-performance map analysis (cIPMA). Journal of Retailing and Consumer Services, 78, 103723.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the academy of marketing science, 43, 115-135.

Howat, G., & Assaker, G. (2013). The hierarchical effects of perceived quality on perceived value, satisfaction, and loyalty: Empirical results from public, outdoor aquatic centres in Australia. Sport management review, 16(3), 268-284.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration (ijec), 11(4), 1-10.

Mainardes, E. W., de Melo, R. F. S., & Moreira, N. C. (2021). Effects of airport service quality on the corporate image of airports. Research in Transportation Business & Management, 41, 100668.

Matthews, L., Hair, J., & Matthews, R. (2018). PLS-SEM: The holy grail for advanced analysis. Marketing Management Journal, 28(1), 1-13.

Pappachan, J. (2020). Airport service quality dimensions and its influence on airline passengers' satisfaction in India. J Business Manag Stud, 5(1), 10-18.

https://doi.org/10.36348/sjbms.2020.v05i01.002

Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (2019). Managing and using information systems: A strategic approach. John Wiley & Sons.

Prentice, C., & Kadan, M. (2019). The role of airport service quality in airport and destination choice. Journal of Retailing and Consumer Services, 47, 40-48.

Ragab, M. A., & Arisha, A. (2018). Research methodology in business: A starter's guide.

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results: The importance-performance map analysis. Industrial management & data systems, 116(9), 1865-1886.

Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. The international journal of human resource management, 31(12), 1617-1643.

Sarstedt, M., Hair Jr, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. Australasian marketing journal, 27(3), 197-211.

Saunders, M. N., & Townsend, K. (2018). Choosing participants. The Sage handbook of qualitative business and management research methods, 480-494.

Shah, F. T., Syed, Z., Imam, A., & Raza, A. (2020). The impact of airline service quality on passengers' behavioral intentions using passenger satisfaction as a mediator. Journal of Air Transport Management, 85, 101815.

Stephano, D., Jani, D., & Mfinanga, D. (2024). Does the airport servicescape affect the relationship between a irport outcome quality and passenger satisfaction? Business management review, 27(1), 39-56.

Tahanisaz, S. (2020). Evaluation of passenger satisfaction with service quality: A consecutive method applied to the airline industry. Journal of Air Transport Management, 83, 101764.

Trischler, J., & Lohmann, G. (2018). Monitoring quality of service at Australian airports: A critical analysis. Journal of Air Transport Management, 67, 63-71.

Usman, A., Azis, Y., Harsanto, B., & Azis, A. M. (2022). Airport service quality dimension and measurement: a systematic literature review and future research agenda. International Journal of Quality & Reliability Management, 39(10), 2302-2322.

Wu, H.-C., & Cheng, C.-C. (2013). A hierarchical model of service quality in the airline industry. Journal of Hospitality and Tourism Management, 20, 13-22.

Zidarova, E. D., & Zografos, K. G. (2011). Measuring quality of service in airport passenger terminals. Transportation Research Record, 2214(1), 69-76. https://doi.org/https://doi.org/10.3141/2214-09