Digitalisation and Service Quality at Domestic Airports in a Developing Economy: Evidence from Namibia

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ABSTRACT

This study examines how airport digitalisation contributes to service quality and passenger satisfaction at domestic airports in Namibia. Although digital technologies are increasingly used to improve passenger processing, information access and airport coordination, existing airport service quality research remains strongly centred on large international airports and conventional service quality models. This creates a gap in understanding how digitalisation becomes service value in smaller and resource constrained domestic airport settings. Drawing on service quality theory, the Technology Acceptance Model, the Unified Theory of Acceptance and Use of Technology and Expectation Confirmation Theory, the study develops and tests a Domestic Airport Digital Service Quality Model. The model proposes that airport digitalisation improves operational efficiency, operational efficiency improves domestic airport service quality, and domestic airport service quality improves passenger satisfaction. A quantitative explanatory design was adopted and data were analysed using partial least squares structural equation modelling. The measurement model showed strong indicator loadings, internal consistency, convergent validity and discriminant validity. The structural model showed significant positive relationships among airport digitalisation, operational efficiency, and domestic airport service quality and passenger satisfaction. The mediation results further confirmed that airport digitalisation influences passenger satisfaction through a sequential service delivery chain. The study contributes to knowledge on airport service quality by shifting the airport service quality debate from generic service quality and large airport settings toward a context specific digital service quality model for domestic airports in developing economies. The findings offer practical guidance for airport authorities seeking to make digital transformation meaningful for passengers through reliable operations, responsive services and human supported digital systems.

Keywords: airport digitalisation, domestic airports, operational efficiency, passenger satisfaction, service quality

INTRODUCTION

Digitalisation has become an important part of airport service delivery because airports increasingly depend on digital information systems, self-service technologies, automated passenger processing, mobile platforms and connected operational systems to improve the travel experience [1]. In contemporary airport management, digitalisation is not merely a technical upgrade. It changes how passengers obtain information, move through airport procedures, interact with staff, assess waiting time and form judgements about reliability, convenience and service confidence [2]. Technology therefore has the capacity to increase efficiency, safety, satisfaction and process coordination. However, its use also poses risks, including system failure, privacy concerns, technological exclusion and reduced human interaction.

Airport service quality has traditionally been studied through broad service quality dimensions such as reliability, responsiveness, assurance, empathy and tangibles [3]. This tradition remains useful because passengers still judge airport services through visible and experiential dimensions such as staff behaviour, process reliability, comfort, information accuracy, safety and waiting time. However, recent airport research suggests that service quality measurement needs to reflect digital service encounters more explicitly. Batouei et al. [4] showed that self-service technologies, service fairness and service encounters influence traveler

satisfaction and behavioural intentions. Moreover, Usman et al. [5] point to the diversity of research on airport service quality, which implies the need to refine airport service quality measurement dimensions. This also calls for a deliberate attempt to determine possible directions for further investigation in this area. At the same time, the complexity of the problem becomes more obvious in emerging markets, where digitalisation is shaped by interconnected factors such as infrastructure availability, financial capacity, user literacy, staff technical skills and passenger trust in digital technologies. Although small and regional airports can obtain substantial advantages through innovation, they often face challenges in implementing digital technologies because of limited funding and existing technological constraints [6].

Passenger receptiveness to airport self-service technology is another practical issue. Although passengers often appreciate the convenience of innovative airport services, many still prefer to interact with employees in situations associated with time pressure, baggage check-in, and unfamiliarity with processes or elevated stress levels. As evidenced by Chaiwan et al. [2] and Kamran et al. [7], resistance to self-service technologies remains an important obstacle to their further implementation. This means that digitalisation cannot be assumed to improve service quality automatically. It must be examined through the service delivery conditions under which passengers experience it.

Namibia provides a relevant context for this debate because domestic airports operate in a developing economy where airport digitalisation must support both operational performance and passenger experience. The Namibia Airports Company manages the country's airport infrastructure as a state owned enterprise established under the Namibia Airports Company Act, Act 25 of 1998 [8]. Domestic airports support internal mobility, tourism circulation, business travel and access to regional economic spaces. Their service quality is therefore not only an airport management matter. It is part of wider national connectivity and public service performance in the air transport system.

This article addresses the following research question: How does airport digitalisation influence domestic airport service quality and passenger satisfaction in a developing economy? To answer this question, the article develops and tests a Domestic Airport Digital Service Quality Model (DADSQM) in which airport digitalisation is positioned as the enabling construct, operational efficiency as the service process mechanism, domestic airport service quality as the service outcome, and passenger satisfaction as the final passenger outcome. The article contributes to knowledge by explaining not only whether digitalisation matters, but also how it becomes service quality value through airport operations and passenger centred service experience.

LITERATURE REVIEW

Airport service quality and the digital airport experience

Service quality theory explains quality as a judgement formed when customers compare expected service with perceived service performance [3]. In airport environments, passengers evaluate service quality through several touchpoints; including access, check in, security, wayfinding, information provision, staff responsiveness, baggage processes, terminal comfort and the perceived fairness of service encounters. These touchpoints make airport service quality multidimensional rather than a single satisfaction score. The implication is that digitalisation must be evaluated against the whole airport experience, because a digital failure at one point of the journey can influence passengers' overall perception of the airport. Empirical research supports this multidimensional view. Batouei et al. [4] found that service fairness, service encounter and self-service technologies significantly shape traveller satisfaction, which is then associated with revisit intention and word of mouth. In a study by Mainardes et al. [9], it emerged that airport service quality plays an important role in passenger satisfaction. That means that passengers do not view airport technology in isolation but as an integral part of a greater whole that requires consideration.

Digitalisation also contributes to the development of new concepts associated with airport service quality due to the fact that passengers now interact with airports at all stages of the journey: before, during, and after using various services like digital check-ins, digital platforms for providing information, digital payments, automatic announcements, feedback forms, and operational information systems. However, the literature discourages any

technological determinism and calls for the recognition of some negative aspects. For instance, Chaiwan et al. [2] found that some passengers reject self-service technologies available in the airport and opt for human contact. Also, Büyüksaatçı Kiriş and Akıf [1] raised the question of the risks posed by technological problems, privacy issues, technological gap, and human interaction deprivation. A service quality model for domestic airports must therefore connect digital systems to operational and human support conditions.

Theoretical foundations

This article integrates four theoretical perspectives. First, SERVQUAL provides the service quality foundation by emphasising reliability, responsiveness, assurance, empathy and tangibles [3]. Its relevance lies in explaining how passengers judge airport service performance. However, SERVQUAL alone does not fully explain digitally mediated service encounters because it was developed before contemporary airport digitalisation became central to passenger processing. For that reason, the model retains the service quality logic of SERVQUAL while extending it to include digitalisation and operational efficiency.

Second, the Technology Acceptance Model explains why digital airport systems become useful only when passengers perceive them as helpful and easy to use [10]. Digital systems that are available but confusing, unreliable or poorly supported may not improve service quality. Third, the Unified Theory of Acceptance and Use of Technology adds the importance of facilitating conditions that are particularly important in domestic airports [11]. This is because adoption of technology platforms is dependent on availability of infrastructure, staff support and the reliability of digital processes.

The Expectation Confirmation Theory is also essential because it explains how passengers translate airport experience into satisfaction by comparing expectations with actual performance [12]. Recent airport research also shows that expectation confirmation and satisfaction help explain passengers' behavioural intentions in developing economy airport contexts [13]. This theory is important because digitalisation can improve satisfaction when it confirms or exceeds expectations of speed, clarity, convenience and reliability. It can also reduce satisfaction when passengers expect digital systems to simplify the journey but experience delays, system failure or inadequate human support. Together, these theories justify an integrated model in which digitalisation influences satisfaction through operational efficiency and domestic airport service quality rather than through technology presence alone.

Developing economy and domestic airport context

Developing economy airport research shows that service quality, passenger satisfaction and airport image are connected, but the relationship is conditioned by institutional capacity and infrastructure readiness. Usman et al. [14] found that service orientation and airport service quality influence passenger satisfaction and image in Indonesia. Usman et al. [15] also showed that innovation contributes to airport image through service quality and passenger satisfaction. These studies are useful because they show that innovation and service quality are connected, but they are largely drawn from larger airport environments. Their findings require contextual adaptation before being applied to domestic airports in a smaller developing economy.

African airport evidence reinforces the need for context sensitivity. Mtafya and Mutalemwa [16] found that airport services influence passenger satisfaction at Julius Nyerere International Airport in Tanzania. Mapunda and Mwageni [17] further showed that airport facilities, airport environment and security screening practices affect airline passenger satisfaction in the Tanzanian airport context. These studies show that passengers in African airports respond strongly to practical service conditions such as procedural clarity, staff professionalism, physical environment and security processes. Digitalisation must therefore be interpreted as one part of an integrated airport service system rather than as a detached technology project.

Domestic airports differ from major international airports because they often operate with smaller passenger volumes, leaner staffing, tighter budgets and varying levels of system maturity. Their passenger base may also include travellers with different levels of digital confidence. This makes the Namibian domestic airport context theoretically meaningful. A model developed for such a context can explain how digitalisation contributes to service quality under conditions where passenger support, operational coordination and resource readiness

matter strongly. The article therefore treats domestic airport digitalisation as a service delivery process shaped by technology, people, procedures and context.

Hypotheses and proposed model

The first relationship in the model links airport digitalisation to operational efficiency. Digital airport systems can improve operational efficiency by supporting faster passenger processing, clearer information flow, improved coordination and more predictable service procedures. When airport digital tools are reliable and aligned with service processes, they can reduce duplication, minimise waiting time and support better staff coordination. The first hypothesis is therefore stated as follows.

H1: Airport digitalisation positively predicts operational efficiency at domestic airports.

The second relationship links operational efficiency to domestic airport service quality. Passengers are more likely to perceive service quality positively when airport processes are organised, predictable and responsive. Efficient operations support reliability, responsiveness, information quality and confidence. The second hypothesis is therefore stated as follows.

H2: Operational efficiency positively predicts domestic airport service quality.

The third relationship links domestic airport service quality to passenger satisfaction. Service quality is expected to shape passenger satisfaction because passengers evaluate their overall airport experience through the services they receive, the waiting time they experience, the support they obtain and the clarity of the process. The third hypothesis is therefore stated as follows.

H3: Domestic airport service quality positively predicts passenger satisfaction.

The model also assumes mediation. Airport digitalisation is expected to influence domestic airport service quality through operational efficiency, because digital systems must first improve airport processes before passengers experience them as service quality value. The fourth hypothesis is therefore stated as follows.

H4: Operational efficiency mediates the relationship between airport digitalisation and domestic airport service quality.

Finally, the model assumes a sequential mechanism in which airport digitalisation improves operational efficiency, operational efficiency improves domestic airport service quality, and domestic airport service quality improves passenger satisfaction. The fifth hypothesis is therefore stated as follows.

H5: Airport digitalisation has a positive serial indirect effect on passenger satisfaction through operational efficiency and domestic airport service quality.

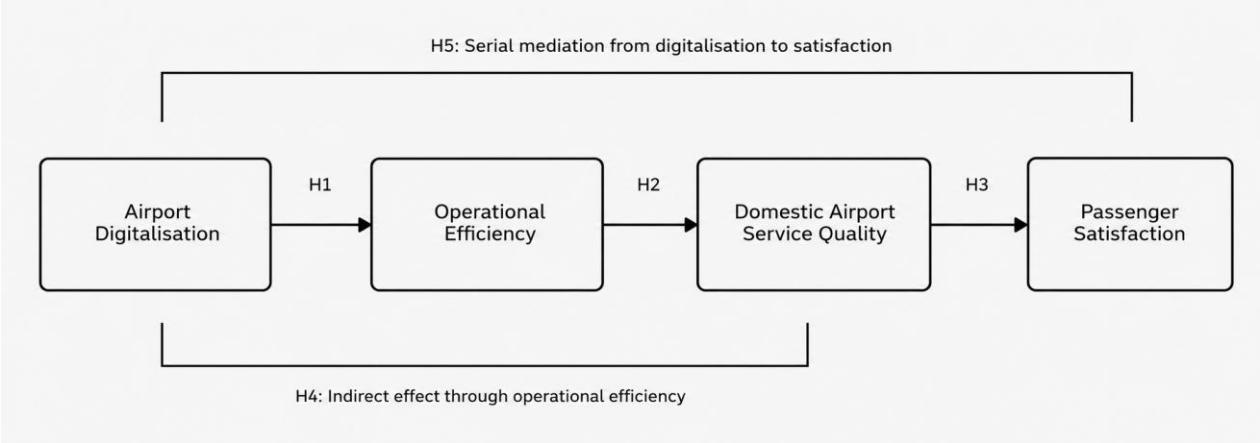

Figure 1. Proposed DADSQM

RESEARCH METHODS

Research design and context

The study adopted a quantitative explanatory design because it sought to test relationships among latent variables in a proposed service quality model. The quantitative approach was suitable because the study measured passenger perceptions numerically and examined the strength and significance of relationships among airport digitalisation, operational efficiency, and domestic airport service quality and passenger satisfaction. The explanatory design was appropriate because the purpose of the study was not limited to describing digitalisation at domestic airports. It aimed to explain how digitalisation contributes to passenger satisfaction through operational and service quality mechanisms.

The empirical context was domestic airports in Namibia. The unit of analysis was the passenger who had used a domestic airport service. This unit of analysis was appropriate because the study focused on perceived service quality and satisfaction, both of which are formed through passenger experience. Screening was used to ensure that respondents had recent domestic airport experience before completing the questionnaire. This helped align the data with the purpose of the study, because responses had to be based on actual airport service experience rather than general views about aviation or technology.

Population, sampling and sample size logic

The population consisted of passengers who use selected domestic airports in Namibia. The population was treated as large and continuously changing because the researcher did not have access to a complete sampling frame of all eligible domestic airport passengers. Under such conditions, probability sampling from a complete list was not practically feasible. Cochran's [18] formula for large or unknown populations was therefore used to estimate the ideal survey sample size. Using a 95 percent confidence level, a 5 percent margin of error and a population proportion of 0.50, the ideal sample size was estimated at 385 respondents.

The study used intercept convenience sampling among eligible passengers who met the screening criterion of recent domestic airport use. This approach was appropriate because airport passengers are mobile, the population is continuously changing and no complete passenger list was available to support probability sampling. Respondents were therefore selected on the basis of accessibility and relevance to the study purpose. The approach was suitable for collecting perception data from passengers with direct experience of domestic airport services.

Instrument and measurement

Data were collected through a structured questionnaire designed around four reflective constructs: airport digitalisation, operational efficiency, and domestic airport service quality and passenger satisfaction. Each construct was measured using four indicators, resulting in sixteen core measurement items. A seven point Likert scale was used to capture the degree of agreement with each statement. The scale was suitable because it allowed respondents to express varying levels of perception regarding digital services, airport operations, service quality and satisfaction.

The measurement structure followed the logic of reflective modelling because the items were treated as manifestations of their underlying constructs. Airport digitalisation represented passengers' perceptions of digital systems and digital service support. Operational efficiency represented perceptions of speed, coordination and predictability in airport processes. Domestic airport service quality captured the perceived quality of service delivery in the domestic airport environment. Passenger satisfaction captured overall satisfaction with the airport service experience. The questionnaire items were aligned with the theoretical foundations of the study and contextualised to the domestic airport service environment.

Data analysis

Partial least squares structural equation modelling was used to analyse the data because the study tested a prediction oriented model involving latent variables and mediation paths. PLS SEM is suitable when the objective is to explain variance in endogenous constructs and assess complex relationships among latent variables [19]. The analysis followed a two stage approach. First, the measurement model was assessed to establish indicator reliability, internal consistency reliability, convergent validity and discriminant validity. Second, the structural model was assessed to test the hypothesised relationships and mediation effects.

The measurement model was assessed using indicator loadings, Cronbach alpha, composite reliability, average variance extracted, heterotrait-monotrait ratio and the Fornell-Larcker criterion. The structural model was assessed using path coefficients, t statistics, probability values, R square values, effect sizes, indirect effects, total effects and model fit indicators. Bootstrapping was used to test the significance of the direct and indirect effects. This procedure was appropriate because it allowed the study to determine whether the proposed DADSQM was supported both statistically and conceptually.

Ethical considerations

The study required ethical safeguards because it collected perception data from human participants. Participation was voluntary, and respondents were informed about the purpose of the study, the expected time required to complete the questionnaire, their right to decline participation and their right to withdraw before submitting the questionnaire. No personally identifying information was collected. Responses were stored securely and reported in aggregate form.

DISCUSSION OF RESULTS

Measurement model

Table 1. Indicator loading summary

Construct	Indicators	Loading range
Airport digitalisation	AD1 to AD4	0.874 to 0.903
Operational efficiency	OE1 to OE4	0.898 to 0.927
Domestic airport service quality	DASQ1 to DASQ4	0.884 to 0.907
Passenger satisfaction	PS1 to PS4	0.917 to 0.935

The indicator loading results show that all measurement items performed strongly in relation to their respective constructs. The loading ranges were above the commonly accepted minimum of 0.708, which suggests that each indicator explained a substantial proportion of variance in its assigned construct. Airport digitalisation recorded loadings between 0.874 and 0.903, operational efficiency recorded loadings between 0.898 and 0.927, domestic airport service quality recorded loadings between 0.884 and 0.907, and passenger satisfaction recorded loadings between 0.917 and 0.935. These results confirm that the indicators were statistically suitable for testing the DADSQM.

Table 2. Construct reliability and convergent validity

Construct	Cronbach alpha	rho_a	rho_c	AVE
Airport digitalisation	0.911	0.917	0.938	0.790

Domestic airport service quality	0.917	0.917	0.941	0.800
Operational efficiency	0.931	0.934	0.951	0.829
Passenger satisfaction	0.946	0.947	0.961	0.861

The reliability and convergent validity results show that all constructs met the expected statistical requirements. Cronbach alpha values ranged from 0.911 to 0.946, while composite reliability values ranged from 0.938 to 0.961. These values confirm strong internal consistency. The average variance extracted values ranged from 0.790 to 0.861, which is above the minimum threshold of 0.500. This means that each construct explained a substantial proportion of variance in its indicators. The results support the credibility of the model because the structural relationships were tested on a stable measurement foundation.

Table 3. Discriminant validity using HTMT

Relationship	**HTMT value**
Domestic airport service quality and airport digitalisation	0.472
Operational efficiency and airport digitalisation	0.642
Operational efficiency and domestic airport service quality	0.572
Passenger satisfaction and airport digitalisation	0.237
Passenger satisfaction and domestic airport service quality	0.652
Passenger satisfaction and operational efficiency	0.298

The HTMT values confirm discriminant validity because all values were below the more conservative threshold of 0.850 and the more liberal threshold of 0.900. The constructs are therefore related but statistically distinct. This is important because the study examines a process model in which digitalisation, operational efficiency, service quality and satisfaction play different roles. If these constructs were not distinct, the model would be difficult to defend because the variables would appear to measure the same phenomenon. The HTMT results support the view that passengers can distinguish between digital systems, efficient processes, service quality and satisfaction.

Table 4. Discriminant validity using the Fornell-Larcker criterion

Construct	**AD**	**DASQ**	**OE**	**PS**
Airport digitalisation	0.889			
Domestic airport service quality	0.436	0.895		
Operational efficiency	0.598	0.529	0.911	
Passenger satisfaction	0.222	0.608	0.280	0.928

The Fornell-Larcker results further support discriminant validity. The square root of AVE for each construct was higher than its correlations with other constructs. This confirms that each construct shared more variance with its own indicators than with other constructs in the model. The finding is important for the article because digitalisation and service quality must remain analytically separate for the study to make a meaningful

contribution. The results show that digitalisation is not simply another label for service quality. It is an enabling construct that operates through airport processes to influence service experience and satisfaction.

Table 5. Collinearity statistics

Indicator group	**VIF range**
Airport digitalisation indicators	2.814 to 3.052
Domestic airport service quality indicators	2.726 to 3.349
Operational efficiency indicators	3.035 to 3.909
Passenger satisfaction indicators	3.680 to 4.413

The variance inflation factor values show that collinearity was not a serious threat to model estimation. The VIF values ranged from 2.814 to 4.413 and remained below the threshold of 5.000. The passenger satisfaction indicators recorded the highest values, which is understandable because satisfaction items often measure closely related perceptions such as overall satisfaction, positive impression and willingness to recommend. The results indicate that the indicators were sufficiently related to represent their constructs without creating problematic redundancy.

Structural model

Table 6. Direct path coefficients and bootstrapping results

Relationship	**Original sample**	**Sample mean**	**Standard deviation**	**t statistic**	**p value**
Airport digitalisation -> Operational efficiency	0.598	0.600	0.056	10.718	$p < .001$
Operational efficiency -> Domestic airport service quality	0.529	0.532	0.066	8.046	$p < .001$
Domestic airport service quality -> Passenger satisfaction	0.608	0.608	0.067	9.063	$p < .001$

The structural model results show that all hypothesised direct relationships were positive and statistically significant. Airport digitalisation positively predicted operational efficiency, with a path coefficient of 0.598 and a t statistic of 10.718. Operational efficiency positively predicted domestic airport service quality, with a path coefficient of 0.529 and a t statistic of 8.046. Domestic airport service quality positively predicted passenger satisfaction, with a path coefficient of 0.608 and a t statistic of 9.063. These findings support H1, H2 and H3. The results also show that the strongest direct relationship was between domestic airport service quality and passenger satisfaction, confirming that satisfaction is mainly shaped by the quality of the service experience.

Table 7. Explained variance

Endogenous construct	**R square**	**Adjusted R square**
Operational efficiency	0.357	0.351
Domestic airport service quality	0.280	0.273

Passenger satisfaction	0.370	0.363

The R square values show that the model explained meaningful levels of variance in the endogenous constructs. Airport digitalisation explained 35.7 percent of the variance in operational efficiency. Operational efficiency explained 28.0 percent of the variance in domestic airport service quality. Domestic airport service quality explained 37.0 percent of the variance in passenger satisfaction. These values are appropriate for a focused model with a sequential explanatory structure. They also show that the model has useful explanatory power while leaving room for future studies to add variables such as passenger digital readiness, infrastructure readiness, staff digital capability and human support.

Table 8. Effect size results

Relationship	**f square value**
Airport digitalisation -> Operational efficiency	0.556
Operational efficiency -> Domestic airport service quality	0.389
Domestic airport service quality -> Passenger satisfaction	0.586

The f square values show that the predictors made meaningful contributions to the endogenous constructs. Airport digitalisation had a strong effect on operational efficiency, operational efficiency had a meaningful effect on domestic airport service quality, and domestic airport service quality had the strongest effect on passenger satisfaction. These findings reinforce the central argument of the article. Digitalisation matters, but its value is realised when it improves airport processes and when those improved processes are experienced by passengers as better service quality.

Table 9. Specific indirect effects

Indirect relationship	**Original sample**	**Sample mean**	**Standard deviation**	**t statistic**	**p value**
AD -> OE -> DASQ	0.316	0.320	0.054	5.865	$p < .001$
OE -> DASQ -> PS	0.322	0.324	0.059	5.473	$p < .001$
AD -> OE -> DASQ -> PS	0.192	0.195	0.043	4.428	$p < .001$

The indirect effects provide the strongest support for the process logic of the model. Airport digitalisation had a significant indirect effect on domestic airport service quality through operational efficiency. This supports H4 and confirms that digitalisation improves service quality by first improving airport processes. The serial indirect effect from airport digitalisation to operational efficiency, then to domestic airport service quality and finally to passenger satisfaction was also significant. This supports H5 and confirms that digitalisation influences passenger satisfaction through a service delivery chain. The finding strengthens the originality of the article because it shows how digitalisation becomes passenger value in domestic airports.

Table 10. Total effects

Relationship	**Original sample**	**Sample mean**	**Standard deviation**	**t statistic**	**p value**
AD -> OE	0.598	0.600	0.056	10.718	$p < .001$
AD -> DASQ	0.316	0.320	0.054	5.865	$p < .001$
AD -> PS	0.192	0.195	0.043	4.428	$p < .001$

OE -> DASQ	0.529	0.532	0.066	8.046	p < .001
OE -> PS	0.322	0.324	0.059	5.473	p < .001
DASQ -> PS	0.608	0.608	0.067	9.063	p < .001

The total effects results provide a complete picture of influence in the model. Airport digitalisation had its strongest total effect on operational efficiency and smaller indirect effects on domestic airport service quality and passenger satisfaction. This pattern confirms that airport digitalisation is not the final passenger outcome. Its value lies in how it improves operations, and how passengers experience those improved operations as better service quality. Operational efficiency also had an indirect effect on passenger satisfaction through service quality. This reinforces the view that efficient airport processes must be translated into perceived service quality before they become satisfaction outcomes.

Table 11. Model fit

Fit measure	**Saturated model**	**Estimated model**
Standardised root mean square residual	0.049	0.060
d ULS	0.324	0.489
d G	0.269	0.277
Chi square	156.154	159.577
Normed fit index	0.894	0.892

The model fit results support the acceptability of the simplified model. The standardised root mean square residual was 0.049 for the saturated model and 0.060 for the estimated model, both of which were below the commonly accepted level of 0.080. The normed fit index values were slightly below 0.900 but close enough to suggest reasonable fit for a focused partial least squares model. These results indicate that the proposed sequence from airport digitalisation to operational efficiency, then to domestic airport service quality and passenger satisfaction, is statistically defensible.

Table 12. Post hoc power analysis

Relationship	**Path coefficient**	**Power at 1 percent alpha**	**Power at 5 percent alpha**
AD -> OE	0.598	1.000	1.000
OE -> DASQ	0.529	0.998	1.000
DASQ -> PS	0.608	1.000	1.000

The post hoc power analysis indicates that the model had strong statistical power to detect the hypothesised relationships. The paths from airport digitalisation to operational efficiency and from domestic airport service quality to passenger satisfaction both recorded power values of 1.000 at the one percent and five percent alpha levels. The relationship between operational efficiency and domestic airport service quality recorded a power value of 0.998 at the one percent level and 1.000 at the five percent level. These results suggest that the tested relationships were sufficiently strong and detectable within the analysed model.

FINDINGS

The results support the proposed DADSQM and provide evidence that digitalisation contributes to passenger satisfaction through a sequential service delivery pathway. The positive relationship between airport digitalisation and operational efficiency confirms that digital tools are meaningful when they improve the organisation, speed and predictability of domestic airport processes. This finding aligns with airport digitalisation literature showing that digital systems can improve passenger processing, information access and resource coordination when they are properly implemented [1, 20]. In the Namibian domestic airport context,

this suggests that digitalisation should be judged by its operational usefulness rather than by the mere presence of digital platforms.

The positive relationship between operational efficiency and domestic airport service quality shows that passengers interpret efficient airport processes as part of service quality. This finding is important because it connects operations management with passenger experience. When procedures are predictable, queues are managed, information is clear and staff coordination is visible, passengers are more likely to perceive the airport as reliable and responsive. This supports the service quality tradition, but it also extends it by showing that operational efficiency acts as a bridge between digital systems and passenger perceived quality. The finding is particularly relevant for domestic airports, where limited resources can make process discipline and coordination central to service perception.

The strongest direct relationship in the model was between domestic airport service quality and passenger satisfaction. This confirms that passenger satisfaction depends largely on the quality of service experienced in the airport environment. The result is consistent with airport studies showing that service quality influences satisfaction, behavioural intention, trust and image [4, 9, 21]. The finding also shows that digitalisation does not replace service quality. Rather, digitalisation must improve service quality if it is to matter to passengers. A digital system that does not reduce confusion, waiting time or uncertainty may have limited satisfaction value.

The mediation results are the most important scholarly finding. The significant indirect effect from airport digitalisation to domestic airport service quality through operational efficiency shows that digitalisation becomes service quality through airport processes. The significant serial indirect effect further shows that digitalisation reaches passenger satisfaction through operational efficiency and service quality. This finding addresses the main research gap because it explains how digitalisation becomes passenger value in domestic airports within a developing economy. It moves the debate beyond the simple claim that digitalisation improves satisfaction and instead shows the service delivery mechanism through which that improvement occurs.

The findings also caution against assuming that digitalisation is universally beneficial. The literature shows that some passengers may resist airport self-service technologies and prefer human staff interaction [2]. This means that domestic airport digitalisation should not remove the human element from service delivery. It should strengthen staff ability to support passengers, provide alternative service channels and respond to digital service failures. In developing economy domestic airports, passenger confidence may depend on the combination of reliable digital systems and visible human assistance. The practical implication is that digital transformation should be designed as a supported service ecosystem, not as a replacement for staff based service delivery.

The paper makes a theoretical contribution by integrating service quality theory, technology acceptance logic, facilitating conditions and expectation confirmation into a single domestic airport digital service quality framework. Existing airport service quality studies have often examined service quality, satisfaction, image and behavioural intention, while technology focused studies have examined digital systems and self-service adoption. These findings bring these streams together by showing that airport digitalisation influences passenger satisfaction through operational efficiency and domestic airport service quality. The contribution is therefore not only the inclusion of digitalisation as a variable, but the explanation of its service delivery pathway.

The paper also makes a contextual contribution by focusing on domestic airports in Namibia as a developing economy setting. Much of the airport service quality literature is grounded in large international airports or major airport systems. Domestic airports operate under different conditions, including smaller passenger volumes, resource constraints, leaner staffing and varying levels of passenger digital readiness. The model therefore contributes by adapting the digital service quality debate to a setting where operational coordination, staff support and passenger centred implementation are especially important.

The empirical contribution lies in testing a sequential model with strong measurement and structural results. The measurement model confirms that airport digitalisation, operational efficiency, domestic airport service

quality and passenger satisfaction are reliable and distinct constructs. The structural model confirms that the relationships among these constructs are statistically significant. The mediation results confirm that digitalisation does not influence satisfaction in isolation. It becomes passenger satisfaction through improved operations and improved service quality. This provides a clear original contribution to airport service quality scholarship and to digital transformation research in developing economies.

CONCLUSION

The paper concludes that airport digitalisation contributes to passenger satisfaction at domestic airports through a clear service delivery chain. Digitalisation improves operational efficiency, operational efficiency improves domestic airport service quality, and domestic airport service quality improves passenger satisfaction. The findings show that digital transformation should not be treated as a purely technological investment. Its value depends on whether it improves airport processes and whether passengers experience those improved processes as reliable, responsive and satisfying service. The DADSQM is therefore supported as a useful framework for explaining how digitalisation contributes to service quality and satisfaction in Namibia's domestic airport environment.

RECOMMENDATIONS

The findings have practical implications for airport authorities, airport managers, airlines and policy actors involved in Namibia's domestic aviation system. First, digitalisation should be planned around passenger service outcomes. Airports should not invest in digital systems only to demonstrate technological modernisation. They should invest in systems that improve information access, reduce process delays, support staff coordination and make airport procedures more predictable for passengers. In addition, operational efficiency should be treated as the immediate performance test of airport digitalisation. If digital platforms do not improve check in flow, communication, queuing, payment, feedback handling or service coordination, they may not improve passenger perceived service quality. Digital transformation projects should therefore include clear operational indicators such as waiting time, process completion time, information accuracy and service recovery response.

Second, service quality should remain the central passenger outcome. Digitalisation should strengthen reliability, responsiveness, accessibility, assurance and passenger confidence. Domestic airports should therefore combine digital systems with staff training, visible guidance, clear signage and backup processes for system failure. This is especially important in a developing economy context where passengers may have uneven levels of digital confidence. Finally, human support should remain part of digital service delivery. The literature on passenger non adoption of self-service technologies shows that some travellers prefer human assistance. Domestic airports should therefore avoid replacing human support with technology in ways that leave passengers unsupported. Staff should be trained to guide passengers through digital processes, assist those who struggle with technology and respond quickly when systems fail.

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