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Digital Leadership as a Socio-Technical Buffer in the Smart Airport Transformation of International Airports Sultan Hasanuddin

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ABSTRACT

Digital transformation at airports is generally judged through the efficiency of technology that is face-to-face with passengers. However, terminal operations remain a socio-technical system, that is, a system whose service success is determined by staff capabilities, managerial support, and psychological workload. This study analyzes the influence of digital leadership on technostress and staff performance, as well as examines the influence of technology acceptance by passengers and staff performance in shaping the quality of service at Sultan Hasanuddin International Airport, Indonesia. This study uses an explanatory quantitative design with a cross-sectional approach through a survey of 50 technical and operational staff and 250 passengers using digital services such as self-check-in, biometric verification, and real-time flight information systems. Data analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results showed that digital leadership had a significant effect in reducing technostress ($\beta = -0.412$; $p < 0.001$) and improving staff performance ($\beta = 0.358$; $p = 0.002$), while technostress decreased staff performance ($\beta = -0.295$; $p = 0.004$). Acceptance of technology by passengers had the strongest influence on service quality ($\beta = 0.512$; $p < 0.001$), followed by staff performance ($\beta = 0.485$; $p < 0.001$). This research develops an integrated sociotechnical model in the context of smart airports that shows that digital leadership serves as a psychological and operational buffer that protects frontline staff from technological pressures. These findings confirm that the digitalization of airports is not enough through infrastructure investment alone, but must be accompanied by human-centered leadership, ongoing training, clear service procedures, and operational support to passengers.

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INTRODUCTION

Digital transformation has become a key pillar in the development of the global aviation industry. Modern airports adopt various digital technologies such as self-service check-in, biometric verification, and automated boarding gates, passenger services via mobile phones, and artificial intelligence-based monitoring systems to improve operational efficiency and service quality. The concept of smart airports is evolving as a paradigm that integrates digital technology, data analytics, the Internet of Things (IoT), and automation to create a faster, safer, and more convenient travel experience for passengers (Halpern, N., Mwesiumo, D., Budd, T., Suau-Sanchez, P., & Bråthen, 2021);(Mwesiumo, D., Halpern, N., Bråthen, S., Budd, T., & Suau-Sanchez, 2023);(Rubio-Andrada, L., Celemín-Pedroche, M. S., Escat-Cortés, M.-D., & Jiménez-Crisóstomo, 2023).

The implementation of smart airports is increasingly important as global air traffic increases and passenger expectations for digital-based services. However, most smart airport implementations are still techno-centric, with a primary focus on developing digital infrastructure. In fact, airport services are a socio-technical system that involves interaction between technology, organizations, operational staff, and service users. Therefore, the success of digital transformation is determined not only by technological sophistication, but also by the organization's ability to manage human resources and operational changes (Halpern, N., Mwesiumo, D., Suau-Sanchez, P., Budd, T., & Bråthen, 2021); (Wongyai, P. H., Suwannawong, K., Wannakul, P., Thepchalerm, T., & Arreeras, 2024).

The literature on smart airports is dominated by research on technology acceptance, customer satisfaction, and user experience. Various studies show that perceived usefulness and perceived ease of use have an effect on the acceptance of airport digital services(Rubio-Andrada, L., Celemín-Pedroche, M. S., Escat-Cortés, M.-D., & Jiménez-Crisóstomo, 2023); (Wongyai, P. H., Suwannawong, K., Wannakul, P., Thepchalerm, T., & Arreeras, 2024). However, research integrating organizational factors and service user factors is still limited. (Bethabara, M., Fatimah, A., & Emilisa, 2024) Supporting digital leadership relationships, digital capabilities, and employee performance. Most studies only reviewed the perspective of passengers, while the mechanisms linking digital leadership, employee psychological states, and service quality have not been extensively explored.

The research gap is increasingly visible when smart airports are seen as an organizational transformation process, not just technology adoption. Previous research has rarely examined how digital leadership affects technostress, staff performance, and service quality simultaneously. In addition, studies on technostress in the airport operational environment are limited, although staff are the main actors who interact with digital systems and face pressures due to continuous technological change (Brunner, T. J. J., Schuster, T., & Lehmann, 2023); (van Roekel, H., Branderhorst, M., Tummers, L., & Meijer, 2025).

As an archipelagic country that relies heavily on air transportation, improving the quality of airport services is an important factor in supporting community mobility and regional connectivity. (Sabur, F., 2023) shows that the quality of terminal services affects passenger satisfaction at Sultan Hasanuddin International Airport Makassar, while other studies (U.S., 2019) Emphasizing the importance of a digital-based aviation information system in supporting air transportation service users. From the perspective of service users, the success of smart airports is greatly influenced by the acceptance of technology. Based on the Technology Acceptance Model (TAM), passengers tend to rate digital services positively when technology is considered useful and easy to use. Therefore, the acceptance of technology is expected to increase the perception of service quality as it is able to speed up the travel process and reduce procedural uncertainty(Halpern, N., Mwesiumo, D., Budd, T., Suau-Sanchez, P., & Bråthen, 2021);(Rubio-Andrada, L., Celemín-Pedroche, M. S., Escat-Cortés, M.-D., & Jiménez-Crisóstomo, 2023)(Zhang et al., 2023).

On the other hand, digital transformation also requires the readiness of human resources. In a smart airport environment, operational staff must manage various digital systems, assist passengers, and handle service interruptions in real-time. This condition has the potential to cause technostress that can reduce concentration, increase workload, and reduce service quality (Saidy, J., Garanti, Z., & Sadaka, 2022). Based on socio-technical systems theory, the effectiveness of technology implementation depends on the alignment between the technological subsystem and the social subsystem. In this context, digital leadership plays an important role in helping employees adapt to technological change through the provision of vision, training, operational support, and a learning environment (van Roekel, H., Branderhorst, M., Tummers, L., & Meijer, 2025).

Previous research has shown that digital leadership can improve employee performance through improving digital competence, clarity of tasks, and adaptability to technological changes (Brunner, T. J. J., Schuster, T., & Lehmann, 2023); (Wang, Y., Park, J., & Gao, 2025). On the other hand, high technostress can reduce employee performance and negatively impact service quality (Saidy, J., Garanti, Z., & Sadaka, 2022). Although various service processes have been automated, the passenger experience is still influenced by the ability of staff to assist with the use of digital services and deal with system failures. Therefore, staff performance is expected to contribute directly to the perception of airport service quality (Chaiwan, C., Budd, L., & Ison, 2025); (Wongyai, P. H., Suwannawong, K., Wannakul, P., Thepchalerm, T., & Arreeras, 2024).

Although the literature on smart airports has grown rapidly in the past decade, most research still focuses on the technology dimension and customer experience. Previous studies generally evaluated the effectiveness of self-service technology, biometrics, Internet of Things (IoT), and various contactless technologies in improving operational efficiency and passenger satisfaction. However, the success of smart airport implementation actually depends on the interaction between the technological subsystem and the social subsystem consisting of employees, management, and organizational structures. A systematic review of airport digitalization shows that organizational and human resource factors are still relatively under-appreciated compared to technology and customer aspects (Şahin, İ. E., & Durmaz, 2024).

Based on these theoretical arguments, this study develops a socio-technical smart airport service model that integrates passenger and organizational perspectives. The research model is that digital leadership has a negative effect on technostress (H1) and positive on staff performance (H2), technostress has a negative effect on staff performance (H3), acceptance of technology by passengers has a positive effect on service quality (H4), and staff performance has a positive effect on service quality (H5).

This study aims to analyze the influence of digital leadership on technostress and operational staff performance, as well as evaluate the influence of technology acceptance and staff performance on service quality in a smart airport environment. The novelty of the research lies in the development of a socio-technical smart airport model that places digital leadership as a socio-technical buffering mechanism that affects employee adaptation and service quality simultaneously. Thus, this study expands the smart airport literature from a technology- and customer-focused approach to a more integrative approach by connecting technological, organizational, psychological, and service quality aspects in a single conceptual framework. This study expands the Technology Acceptance Model and socio-technical systems theory by positioning digital leadership as a socio-technical buffer mechanism that simultaneously shapes employee adaptation and passenger service outcomes in a smart airport environment.

METHODS

Design and research location

This study uses an explanatory quantitative design with a cross-sectional survey. This design was chosen because the purpose of the research was to test the theoretical relationship between digital leadership, technostress, staff performance, technology acceptance by passengers, and service quality in the context of a real airport. The sociotechnical perspective is applied by collecting data from two groups of respondents that complement each other, namely operational staff as service providers and passengers as service users.

The location of the research is the terminal area of Sultan Hasanuddin International Airport, Makassar, Indonesia. The airport was chosen because it serves as an important gateway to eastern Indonesia and is gradually adopting digital terminal facilities, including self-check-in, digital information systems, and identity verification technology.

Population and sample

The study population consisted of two groups. The first group is passengers using domestic or international terminal services. Passenger respondents were selected through purposive sampling with inclusion criteria for having used the airport's digital facilities at least twice in the last six months. This criterion ensures that respondents have sufficient experience to assess technology acceptance and service quality. A total of 250 passenger responses were analyzed.

The second group is the technical and operational staff involved in the operation of digital terminal services. This group includes staff responsible for assisting passengers, monitoring service processes, and responding to digital system issues. A total of 50 staff responses were analyzed. Although the staff sample is smaller than the passenger sample, it represents operational personnel who are directly exposed to the demands of technology-based services in their daily work.

Measuring instruments

Data were collected using a structured questionnaire with a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The staff questionnaire measures digital leadership, technostress, and staff performance. Passenger questionnaires measure technology acceptance and perception of service quality. The constructs and operational definitions are summarized in Table 1.

Table 1. Construct operationalization

Construct	Respondent groups	Operational focus
Digital leadership	Operational staff	Managerial digital vision, technical guidance, resource support, clear digital communication, and service recovery procedures.

Construct	Respondent groups	Operational focus
Technostress	Operational staff	Technology-related overload, complexity, uncertainty, interface fatigue, and pressure in the event of a digital service disruption.
Staff performance	Operational staff	Troubleshooting accuracy, response speed, service consistency, digital procedure assistance, and coordination.
Technology acceptance	Passengers	Perception of usefulness and perception of ease of use of airport digital facilities.
Quality of service	Passengers	Reliability, responsiveness, process convenience, trust, and overall quality of digital travel.

Before the main survey, the instrument was tested on 30 respondents from each group outside the main sample. The trial was used to check the clarity of the editorial, the relevance of the item, and the suitability of the questionnaire with the context of airport services.

Data analysis

Data analysis using partial least squares structural equation modelling (PLS-SEM). PLS-SEM is seen as appropriate because the model includes several latent constructs, the number of staff samples is relatively small, and the research objectives are prediction-oriented. The latest methodological guidance recommends that PLS-SEM results be reported through measurement model evaluation, structural model evaluation, and bootstrapping-based significance testing (Hair, J., & Alamer, 2022); (Ringle, C. M., Sarstedt, M., Sinkovics, N., & Sinkovics, 2023).

The measurement model is evaluated through indicator reliability, convergent validity, internal consistency reliability, and discriminant validity. Indicators with outer loading below 0.70 are removed to improve grain reliability. Convergent validity was assessed using an average variance extracted (AVE) with a threshold of 0.50. Internal consistency was tested using Cronbach's alpha and composite reliability. Discriminant validity was evaluated using the Fornell-Larcker criteria. Structural models were tested using bootstrapping with 5,000 subsamples, with significance evaluated at $p < 0.05$.

RESULTS AND DISCUSSION

Respondent profile

This study analyzed the responses of 50 operational staff and 250 passengers. Demographic profiles provide contextual information for interpreting empirical models.

Table 2. Respondent profile

Groups	Characteristics	Categories	Frequency/percentage
Staff (N = 50)	Gender	Male	38 (76%)
		Women	12 (24%)
	Age	< 25 years old	10%
		25-35 years old	40%
		36-45 years old	30%
		> 45 years old	20%
	Working period	< 1 year	5 (10%)
		1-5 years	27 (54%)
		> 5 years	18 (36%)
Passengers (N = 250)	Type of flight	Domestic	215 (86%)
		International	35 (14%)
	Travel destinations	Business/service	142 (56.8%)
		Tour/private	108 (43.2%)
	Age	20-30 years	35%
		31-40 years old	35%

Descriptive statistics

Table 3 summarizes the descriptive tendencies of the main constructs. The values obtained indicate a strong perception of digital leadership, high staff performance, strong acceptance of passenger technology, and a perception of high quality of service. Technostress is at low to moderate levels, which indicates that staff are experiencing technology-related stress, but are not yet at a severe level.

Table 3. Descriptive profile of research constructs

Construct	Average	Interpretation	Key implications
Digital leadership	4.25	Very high	Staff perceives strong managerial support for digital operations.
Technostress	2.55	Low to medium	Technology-related pressures exist, but they are relatively controlled.
Staff performance	4.40	Very high	Staff perceives strong troubleshooting and service capabilities.
Technology acceptance	4.25	Very high	Passengers consider digital facilities useful and easy to use.
Quality of service	4.30	Very high	Passengers perceive the quality of terminal services positively.

Evaluation of measurement models

The measurement model is evaluated before the structural hypothesis is tested. Items with an outer loading below 0.70 are removed. The constructed size meets the criteria of reliability and validity. AVE values range between 0.562 and 0.632, exceeding the recommended threshold of 0.50. Cronbach's alpha value is above 0.850, and composite reliability is above 0.900, indicating strong internal consistency. The Fornell-Larcker criterion is met, so each construct is empirically different from the other constructs in the model.

Table 4. Summary of measurement model evaluation

Criteria	Reported results	Rating
Indicator reliability	Indicators with an outer loading < 0.70 are removed.	The purification of the grains has been carried out.
Convergent validity	AVE range = 0.562-0.632.	Meets the AVE threshold > 0.50.
Internal consistency	Cronbach alpha > 0.850; Composite reliability > 0.900.	Strong reliability.
Discriminatory validity	The Fornell-Larcker criteria are met.	Constructs are empirically different.

Structural models and hypothesis testing

The structural model was tested using bootstrapping with 5,000 subsamples. Table 5 presents the path coefficient, t-statistic, p-value, and hypothetical decision.

Table 5. Structural line results

Hypothesis	Pathway	Coefficients (beta)	t-statistic	p-value	Verdict
H1	KD -> TS	-0.412	4.125	< 0.001	Supported
H2	KD -> KS	0.358	3.644	0.002	Supported
H3	TS -> KS	-0.295	2.981	0.004	Supported
H4	PTP -> KL	0.512	6.044	< 0.001	Supported
H5	KS -> KL	0.485	5.213	< 0.001	Supported

Note. KD = digital leadership; TS = technostress; KS = staff performance; PTP = acceptance of passenger technology; KL = quality of service.

The results support all the hypotheses proposed. Digital leadership significantly lowers technostress (H1) and improves staff performance (H2). Technostress significantly lowers staff performance (H3). From the perspective of passengers, technology acceptance has the strongest positive influence on service quality (H4), while staff performance also has a substantial positive influence on service quality (H5). Structural model evaluation in PLS-SEM research was used to assess the predictive ability of the model in explaining endogenous variables. This approach is commonly used in information systems research and digital transformation because it emphasizes the predictive capabilities of the model as opposed to just the suitability of the model (Ringle & Sarstedt, 2021).

Table 6. Structural Model Evaluation (R^2, Q^2, and f^2)

Variables/Paths	R^2	Q^2	f^2	Categories / Interpretations
Technostress (TS)	0,17	0,11	DL → TS = 0.21	Weak–moderate R^2, Q^2 relevant, moderate effect

Variables/Paths	R^2	Q^2	f^2	Categories / Interpretations
Staff Performance (KS)	0,42	0,29	DL → KS = 0.18; TS → KS = 0.12	Moderate R^2, medium–strong Q^2, medium–small effect
Quality of Service (KL)	0,61	0,38	PT → KL = 0.35; KS → KL = 0.31	R^2 strong, Q^2 strong, big effect

The results of the analysis showed that the R^2 value (determination coefficient) for the technostress variable was 0.17, which means that 17% of the variation was explained by digital leadership. This value belongs to the low to moderate category, but it is still relevant in the context of digital organizational behavior research. Furthermore, the staff performance variable had an R^2 value of 0.42, indicating moderate explanatory ability of digital leadership and technostress. Meanwhile, the service quality variable had an R^2 value of 0.61, indicating a strong explanatory ability of staff performance and passenger technology acceptance. According to (Ringle & Sarstedt, 2021). The R^2 value of 0.50 and above can be categorized as a model with moderate to strong predictive power in social and management research.

In addition to R^2, the Q^2 (predictive relevance) value is used to assess the predictive relevance of the model through the blindfolding procedure. The results showed that all variables had a Q^2 value above zero, namely technostress (0.11), staff performance (0.29), and service quality (0.38). According to the Stone–Geisser criteria, a value of $Q^2 > 0$ indicates that the model has good predictive relevance (Ofosu, 1974).

The f^2 (effect size) analysis shows that the effect of technology acceptance on service quality has an f^2 value of 0.35, which is included in the large category. Similarly, the influence of staff performance on service quality has an f^2 value of 0.31, which also falls into the large category. Meanwhile, other pathways, such as digital leadership on staff performance and technostress, as well as technostress on staff performance, are in the small to medium category. According to (Cohen, 1988) The f^2 value of 0.02 was categorized as small, 0.15 medium, and 0.35 large, so the results of this study show that the main variables in the model have a substantial influence on service quality.

Discussion

Going beyond the techno-centric view of smart airports

The research findings show that the quality of smart airport services cannot be explained only through technology that directly faces passengers. The acceptance of technology by passengers has the strongest direct influence on service quality, thus confirming that useful and easy-to-use digital services remain the center of terminal satisfaction. These results are consistent with cutting-edge smart airport studies that show that passenger evaluations improve when technology reduces wait times, simplifies processing, and creates smoother journeys (Halpern, N., Mwesiumo, D., Budd, T., Suau-Sanchez, P., & Bråthen, 2021);(Rubio-Andrada, L., Celemín-Pedroche, M. S., Escat-Cortés, M.-D., & Jiménez-Crisóstomo, 2023); (Wongyai, P. H., Suwannawong, K., Wannakul, P., Thepchalerm, T., & Arreeras, 2024).

However, the almost equally strong effect of staff performance on service quality suggests that automation does not eliminate the role of employee service (Rr. Hernitasari A, 2022). These findings support a socio-technical explanation: technology creates service potential, but staff translates that potential into passenger experience through guidance, troubleshooting, and service recovery assistance. These findings are particularly relevant as studies of self-service technology continue to report non-adoption and preference for human support in certain situations (Chaiwan, C., Budd, L., & Ison, 2025).

Digital leadership as a buffer against technostress

The negative influence of digital leadership on technostress provides strong evidence that leadership is not a fringe factor in airport digitalization. When managers clearly communicate digital priorities, provide training, and establish a practical service recovery routine, staff are less likely to see technology as a source of threat. These results are in line with the broader digital leadership literature, which describes digital leadership as the ability to guide employees through technology-based change and strengthen adaptive capacity(Brunner, T. J. J., Schuster, T., & Lehmann, 2023); (van Roekel, H., Branderhorst, M., Tummers, L., & Meijer, 2025). (Gunawan et al., 2023)Found that digital leadership has a positive effect on performance through the mediation of organizational commitments, while the effectiveness of digital leadership greatly determines the success of employee adaptation to technological changes (Yuniarti & Estu Mahanani, 2024). Other findings also confirm that digital leadership is able to increase employee motivation, engagement, and productivity in a digitalized work environment.

Leadership support and organizational resources can reduce the negative impact of technological demands on employee well-being and performance. From the perspective of Job Demands–Resources Theory, leadership serves as a work resource that helps employees cope with the pressures of using technology (Bakker, A. B., & Demerouti, 2017b). In addition, the support of superiors and a responsive work environment has been proven to be able to suppress the emergence of technostress and maintain work effectiveness in a digitalized environment (Tarafdar, M., Cooper, C. L., & Stich, 2019); (Molino, M., Ingusci, E., Signore, F., 2020).

The findings also strengthen the argument that technostress is a relevant risk to performance in frontline operations. The negative influence of technostress on staff performance suggests that overload and technology-related uncertainty can reduce service accuracy and responsiveness. This is consistent with evidence that the creator of technostress can impair performance in frontline employees (Saidy, J., Garanti, Z., & Sadaka, 2022). Similar findings show that increasing levels of technostress during the digital transformation process harm employee performance (Çini, M.A., Erdirençelebi, M., & Akman, 2023) The importance of a source of technostress to the psychological health of remote workers supports the role of burnout as a mediator in the process (Consiglio, C., Massa, N., Sommovigo, V., & Fusco, 2023). In airport terminals, this kind of performance degradation has important consequences because digital service failures can directly affect queues, passenger trust, and perceptions of airport reliability.

Integration of passenger intake and staff capabilities

The shared significance between technology acceptance and staff performance shows that the quality of airport services is generated by the quality of digital interfaces and human support. Passengers rate digital facilities when they are practical and intuitive, which is reflected in the level of acceptance of self-service technology at airports that is influenced by the perception of ease of use and benefits of technology (*Performance expectancy*, *Effort expectancy*), and supporting conditions (*facilitating conditions*) that includes staff assistance interactions when needed (Simarmata et al., 2025). However, a self-service checkin adoption study in Kuala Lumpur shows that the need for human interaction remains a relevant factor in SST usage behavior, as without the ability of staff to help when technology is confusing or fails, the customer experience can deteriorate (Taufik & Hanafiah, 2019).

For Sultan Hasanuddin International Airport, the implication is that digital transformation must be managed as an operational ecosystem. Hardware, software, staff training, escalation procedures, passenger guidance, and leadership routines need to be designed as interdependent components. Digital services that are technically advanced but not supported by capable staff may fail to deliver high-quality services, while capable staff without reliable digital devices may not be able to deliver the expected efficiency. Staff assistance needs to be treated as part of a holistic digital services architecture, where technology and human services complement each other to improve the passenger experience (Antwi et al., 2021).

Theoretical contributions

This research contributes to the smart airport literature in three ways. First, the study expands the study of technology acceptance by showing that passenger acceptance only partially explains the quality of service; Performance on the staff side also has a direct and substantial role. Second, the study incorporated technostress into the study of airport services, thus showing that digital transformation creates psychological work demands for operational staff. Third, the research positions digital leadership as a socio-technical buffer that reduces technostress while improving staff performance. This integrated model responds to the cutting-edge call to expand air transportation service quality research towards technology-based service dimensions and organizational conditions (Zhang, Y., Lee, S.-Y., & Gu, 2023).

This research also makes a theoretical contribution by connecting the Technology Acceptance Model (TAM) with an organizational behavior perspective that emphasizes the role of digital leadership and technostress in determining the success of digital transformation. Most previous research has tended to focus on the acceptance of technology from the user side through the construct of usability perception and usability perception (Davis, 1989); (Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, 2003), while other research places more emphasis on organizational factors such as leadership, work support, and employee well-being in a digital environment (Tarafdar, M., Cooper, C. L., & Stich, 2019). By integrating the variables on the passenger side and the staff side in a single analytical framework, this study offers a more comprehensive explanation of the performance of smart airports compared to technology-oriented (techno-centric) and customer-centric (customer-centric) approaches. These findings support the view that the success of technology implementation is not only determined by user acceptance rates, but also by the organization's ability to build effective digital leadership and minimize the impact of technostress on employee performance. This is supported by the theoretical basis of the TOE Framework, which explains the importance of organizational factors in successful technology adoption (Tornatzky, L. G., & Fleischer, 1990). Thus, the performance of smart airports is the result of an interaction between technology factors, users, and organizational capabilities that reinforce each other.

Practical implications

The results of this study provide clear direction for airport management regarding the integration of digital technology and human interaction in improving service quality. First, digital transformation should not only focus on technology procurement, but also institute systematic digital recovery procedures. This procedure should include response guidance to kiosk disruptions, biometric system incompatibilities, delays in data updates, or passenger confusion. The establishment of such procedures is in line with technological risk management practices that emphasize staff preparedness as a mitigation against system failures (Parasuraman & Colby, 2014).

Second, recurrent training programs need to be designed holistically, including not only the technical operation of digital devices but also case-based troubleshooting scenarios and communication skills with passengers who have a low level of digital trust. Staff's digital literacy and their ability to handle passenger interactions of different levels of comfort with technology have been shown to improve self-service effectiveness and user satisfaction (Wongyai et al., 2024).

Third, technostress monitoring must be an integral part of the occupational health program and service quality control. The psychological stress that arises from the use of complex digital interfaces, intensive dashboard monitoring, and uncertainty during system outages can negatively impact employee performance and service quality (Molino et al., 2020). Mitigation efforts can be carried out through shift rotation, escalation support from superiors, and simplification of the reporting of technical fault reporting channels. This kind of intervention is in accordance with the principle of Job Demands–Resources Theory, which emphasizes the importance of organizational resources to reduce the pressure of technology-based work (Bakker, A. B., & Demerouti, 2017a).

Fourth, digital services that interact directly with passengers must be supported by a clearly visible helpline and easy-to-understand multilingual instructions. This approach ensures that self-service efficiency is maintained, while passengers who need human support are not left out, thus improving the overall user experience. This kind of strategy is also in line with the principle of service-dominant logic, where service value is generated through a combination of human and technological interaction, rather than solely from system automation (Vargo & Lusch, 2004).

The results of the structural model evaluation show that the model has good predictive capabilities, especially in the service quality variable. This is in line with the findings (Ringle & Sarstedt, 2021) which confirms that in the PLS-SEM model, the values of R^2 and Q^2 are more important compared to the global fit model because the main focus is on the prediction and explanation of variance. In addition, the dominance of the influence of technology acceptance on service quality is consistent with the Technology Acceptance Model (TAM) literature, which states that the perception of usability and ease of use is the main determinant in shaping the evaluation of system quality by users (Davis, 1989); (Venkatesh et al., 2003). On the other hand, the findings regarding technostress are also supported by studies (Bharadwaj et al., 2007) which suggests that technological pressures can degrade individual performance in a digital work environment, especially in complex and rapidly changing systems.

Thus, the practical implications of this study emphasize that the success of the implementation of smart airports is not only determined by the quality of the digital interface, but also by the organization's ability to manage human interactions, minimize technostress, and provide responsive, structured, and inclusive operational support. This kind of holistic approach is believed to be able to improve service effectiveness, passenger satisfaction, and staff performance on the frontline.

CONCLUSION

This study concludes that digital transformation at Sultan Hasanuddin International Airport operates as a socio-technical service system. The acceptance of technology by passengers improves the quality of service, while the performance of staff is also an important factor in shaping the perception of service. Digital leadership has an effect on reducing technostress and improving staff performance, while technostress reduces staff performance. This research develops an integrated socio-technical model in the context of smart airports, which shows that digital leadership serves as a buffer mechanism that reduces technostress and improves staff performance, which, together with the acceptance of technology by passengers, determines the quality of service. This model expands the TAM approach by including organizational and psychological dimensions, and proves that service quality is the result of the interaction between technology, people, and leadership. By implication, the success of smart airports depends not only on technology but also on adaptive leadership, staff training, and ongoing operational support.

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