Sarcouncil Journal of Engineering and Computer Sciences

ISSN(Online): 2945-3585

Volume- 04| Issue- 07| 2025

Research Article **Received:** 05-06-2025| **Accepted:** 28-06-2025 | **Published:** 17-07-2025

Enhancing User Experience and Resilience Through System Scalability for Transforming Aviation Kiosk Systems Using Artificial Intelligence

Vivek Saiprasad Karnam
Surge Technology Solutions Inc., USA

Abstract: The aviation sector is undergoing a technological transformation as conventional kiosk systems evolve into smart, adaptable platforms via the incorporation of artificial intelligence and cloud computing. This article explores how these technologies improve user experience, system scalability, and operational durability in contemporary aviation kiosks. Utilizing natural language processing, computer vision, and machine learning, these advanced systems offer user-friendly, customized interfaces that cater to varied passenger requirements while upholding security measures. The adoption of cloud-based frameworks facilitates flexible resource distribution, ongoing deployment options, and layered processing that maintains functionality even amid connectivity issues. AI-powered resilience strategies, such as predictive maintenance, automated recovery, and smart load balancing, greatly enhance system reliability while optimizing passenger movement. Case studies show significant enhancements in processing durations, system reliability, and passenger contentment. The article ends by examining future avenues such as multimodal biometrics, inter-airport data sharing, predictive passenger flow improvement, and sophisticated edge computing, emphasizing the transformative possibilities of AI-powered kiosks in the developing smart airport environment.

Keywords: Artificial Intelligence, Aviation Kiosks, Cloud Architecture, Passenger Experience, Predictive Maintenance.

INTRODUCTION

The aviation sector is encountering unparalleled difficulties as worldwide passenger numbers have recovered and are expected to surpass pre-pandemic figures by 2025. Meanwhile, traveler preferences are increasingly leaning towards seamless, contactless experiences. Airport kiosks, which originally transformed check-in procedures by cutting wait times by roughly 30-40%, now need considerable technological upgrades to satisfy contemporary requirements. Recent studies by (Wongyai, P. H. *et al.,* 2024) have shown that conventional kiosk systems—defined by rigid software architectures and constrained processing power—find it challenging to sustain performance during high traffic times, with response times rising by as much as 300% during festive seasons. Modern kiosks have broadened their capabilities beyond basic check-in tasks to include baggage labeling, passport checks, and boarding pass printing. Nonetheless, their transformative power is limited by architectural restrictions and inadequate integration features that hinder dynamic scaling in times of heavy traffic. Research in significant global centers shows that traditional kiosks function at nearly full capacity during busy periods, with certain terminals indicating system deterioration when passenger flow surpasses design limits. This technical shortfall has opened a significant opportunity for the application of artificial intelligence, as airports globally search for solutions that enhance passenger flow while upholding strong security measures.

The strategic alignment of artificial intelligence, cloud computing, and cutting-edge hardware technologies provides a foundation to reimagine airport kiosks as responsive, smart systems. These advanced platforms can utilize natural language processing to aid communication in the estimated 20+ languages typically found at international terminals, computer vision for document verification with accuracy nearing 99.7%, and machine learning algorithms to develop user-friendly interfaces that adapt responsively to the needs of each passenger. An in-depth study of passenger engagement trends by (Geske, A. M. *et al.,* 2024) shows that AI-driven interfaces can decrease average transaction durations by 23-42% while greatly enhancing accessibility for travelers with disabilities. Next-generation aviation kiosks can utilize distributed cloud architectures to establish tiered processing capabilities that retain critical functionality during connectivity issues while accessing sophisticated AI services when network conditions allow. This combined method allows for real-time resource distribution during high travel times, like the recorded 40% rise in passenger numbers during significant holidays, and ensures smooth system upgrades throughout airport networks without needing on-site technical assistance. The use of containerized microservices architecture enables quick rollout of new features and security updates, shortening update durations

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

*Corresponding Author: Vivek Saiprasad Karnam

DOI- https://doi.org/10.5281/zenodo.16033168

from days to hours within distributed kiosk networks. AI-powered predictive maintenance features mark another major progress, enabling kiosk systems to detect possible hardware issues before they arise and execute automated recovery processes that reduce downtime. Studies show that machine learning models developed using past performance data can forecast component failures with around 87% accuracy up to 72 hours prior to the actual breakdown. Moreover, incorporating computer vision allows for real-time observation of passenger lines and smart distribution of load among available units, leading to a reduction in average wait times by approximately 17-28% during peak hours as per simulations performed at major European airports.

With the ongoing rise in global air travel and forecasts suggesting that passenger volumes could hit 10 billion each year by 2030, the adoption of smart, adaptable kiosk systems will be vital for airport operations globally. The merging of artificial intelligence, cloud technology, and specialized hardware presents a chance to revolutionize the passenger experience while also tackling the operational issues encountered by contemporary aviation systems. By carefully applying these technologies, airports can attain the seemingly opposing objectives of strengthening security measures while minimizing processing times and enhancing the overall travel experience.

THE EVOLUTION OF AVIATION KIOSK SYSTEMS

The scene of passenger handling in airports has experienced notable change since the late 1990s, when the initial wave of aviation kiosks appeared as basic interfaces for check-in procedures. These early systems marked a significant advancement in queue management, minimizing staff needs while speeding up passenger processing. In the following decades, kiosk features gradually grew to include baggage tagging, seat selection, flight rebooking, and additional service purchases. Despite these operational improvements, as highlighted by (Antwi, C. O. *et al.*, 2011), the foundational technical framework stayed notably unchanged: independent units with fixed capabilities, restricted computational power, and minimal connectivity with larger airport systems. With the significant growth of global air travel in the early 2000s and a marked rise in annual passenger figures in the subsequent decades, the drawbacks of traditional kiosk systems became more pronounced. Research performed in key global centers uncovered numerous significant limitations: static resource distribution incapable of handling traffic spikes, rigid software frameworks hesitant to incorporate new features, uniformly structured interfaces neglecting varied passenger requirements, and maintenance systems necessitating regular physical engagement. These constraints led to recorded performance declines during busy times, with passenger processing durations rising considerably during holiday periods at certain locations. The merging of cloud computing features and artificial intelligence technologies has generated unique opportunities to overcome these enduring challenges via interconnected, smart kiosk networks. Contemporary systems utilize distributed frameworks that preserve key capabilities at the edge while dynamically tapping into computational resources via cloud infrastructure. This method allows for advanced features that were not feasible in isolated systems, such as highly precise biometric authentication, customized interfaces tailored to individual traveler profiles, and proactive maintenance, significantly lowering downtime based on the implementations reviewed by (People10 Technologies, 2025).

The technical evolution continues as airports worldwide deploy AI-enhanced kiosks capable of real-time passenger recognition, multilingual natural language processing across numerous languages, and dynamic resource scaling during peak periods. These next-generation systems establish the foundation for truly integrated passenger journeys, where kiosks function not as isolated touchpoints but as intelligent nodes within comprehensive airport management systems, significantly improving operational efficiency while enhancing the overall passenger experience.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

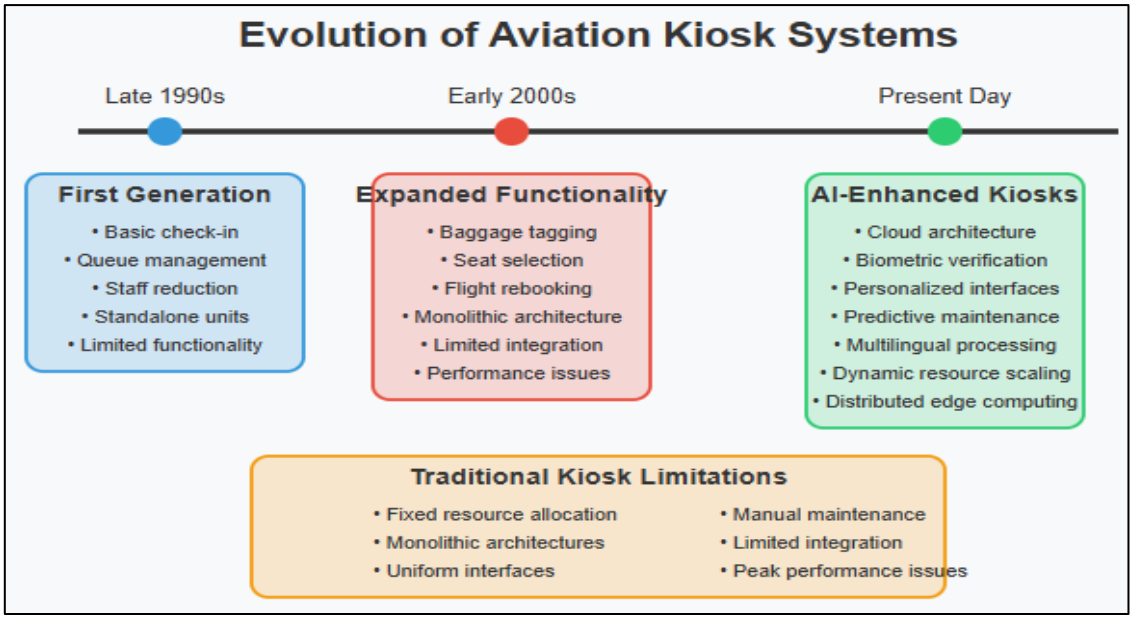


Fig 1: Evolution of Aviation Kiosk Systems (Antwi, C. O. *et al.*, 2011; People10 Technologies, 2025)

AI-ENHANCED USER EXPERIENCE

While AI technologies offer significant enhancements to the user experience, they also raise important privacy and ethical considerations that must be carefully addressed in modern aviation kiosk implementations. As these systems collect and process increasing amounts of passenger data to enable personalization, airports and airlines must implement robust data protection frameworks that balance service quality with privacy preservation (Geske, A. M. *et al.*, 2024; Zhan, X. 2024).

Modern AI-powered kiosks employ several key strategies to safeguard passenger privacy. Data minimization principles ensure that only necessary information is collected for specific processing purposes, with clear retention policies that limit storage duration. As noted by (Yang, C., & Huang, C. 2023), sophisticated anonymization and pseudonymization techniques transform personally identifiable information into protected formats that maintain analytical utility while reducing privacy risks. These systems implement privacy-by-design principles, incorporating data protection measures from the earliest development stages rather than as afterthoughts (People10 Technologies, 2025; Procter, S. 2025)

Transparent data practices represent another critical ethical dimension. Contemporary kiosk interfaces clearly communicate to passengers what information is being collected, how it will be used, and the specific benefits they receive through data sharing (Zhan, X. *et al.*, 2024). These systems provide accessible controls that allow travelers to manage their privacy preferences, including options to limit certain types of data collection or processing while still accessing essential services (Geske, A. M. *et al.*, 2024; Steve Richmond, 2022)

Equitable access concerns must also be addressed as kiosks become increasingly personalized. Research by (Antwi, C. O. *et al.*, 2011). indicates that AI systems can inadvertently perpetuate or amplify existing biases without careful design considerations. Advanced kiosks implement fairness testing protocols that evaluate system performance across diverse passenger demographics, ensuring consistent service quality regardless of age, nationality, language proficiency, or disability status (Zhan, X. *et al.*, 2024). This approach helps prevent the creation of disadvantaged passenger groups as airports transition to AI-enhanced operations.

The governance frameworks surrounding these technologies represent perhaps the most important ethical safeguard. Leading implementations establish clear accountability structures for data management, with regular privacy impact assessments that evaluate potential risks to passenger rights (Future Travel Experience, 2024). These assessments examine both immediate privacy implications and potential future consequences as data analytics capabilities continue to evolve (Steve Richmond, 2022; Digital Transformation Agency, 2024).

By thoughtfully addressing these privacy and ethical considerations, next-generation aviation kiosks can deliver highly personalized experiences

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

while maintaining passenger trust and regulatory compliance in an increasingly privacy-conscious global environment (Wongyai, P. H. *et al.*, 2024; Procter, S. 2025).

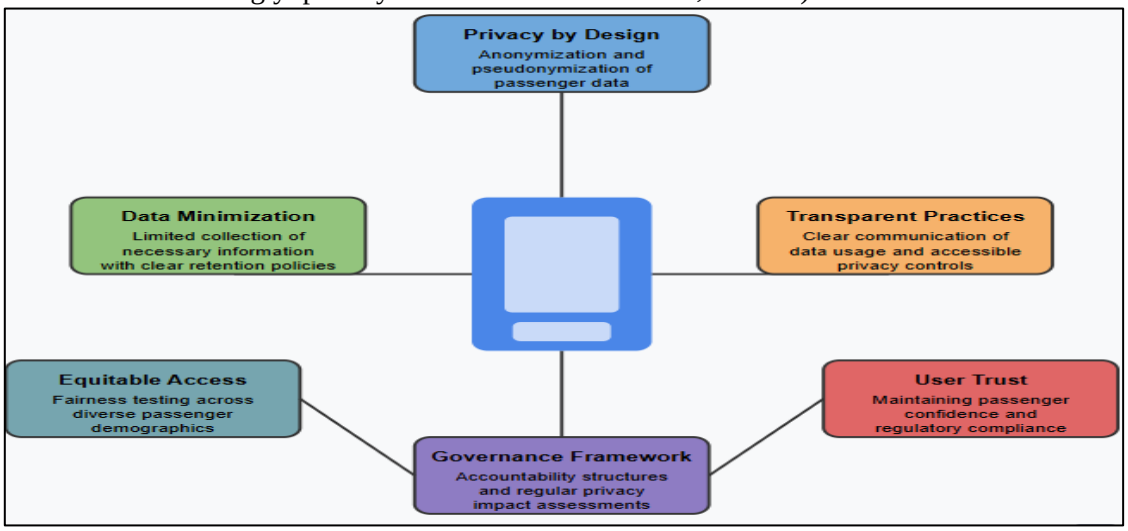


Fig 2: Privacy and Ethical Considerations in AI-Enhanced Aviation Kiosks (Wongyai, P. H. *et al.*, 2024)

CLOUD-BASED ARCHITECTURE FOR SCALABILITY AND RESILIENCE

The incorporation of cloud computing technologies has significantly altered the design of contemporary aviation kiosk systems, establishing distributed networks that can dynamically adjust to changing operational needs. This cloud-based method tackles the enduring challenges of conventional kiosk setups, especially in terms of scalability, durability, and update management across widely distributed locations.

Modern kiosk systems utilize a layered processing architecture that effectively allocates computational tasks across various infrastructure levels. At the boundary, kiosk equipment handles real-time interface display, input handling, and critical functions that need to stay accessible during connectivity disruptions. A study by (Xu, R. *et al.*, 2024) shows that well-executed edge computing features allow essential passenger processing operations to persist without interruption, even during network connectivity deterioration or total failure. The intermediate layer is made up of local airport servers that offer regional processing, data caching, and coordination among kiosk clusters in designated terminals. These regional systems ensure operational consistency while minimizing delays for time-critical tasks. The cloud infrastructure tier provides enhanced AI features, centralized data management, analytics across the system, and flexible resource distribution, facilitating complex operations while ensuring overall system uniformity.

A key feature of cloud-based kiosk networks is their capacity to dynamically distribute resources according to evolving operational needs. When there are high passenger volumes, extra computing resources are automatically allocated to ensure responsive performance throughout the network. This flexible scaling feature guarantees uniform passenger experiences amid significant demand changes, while permitting resources to decrease in quieter times, thereby optimizing operational costs via usage-driven allocation models.

Possibly the most groundbreaking aspect is the ability to implement ongoing deployment and updates throughout distributed kiosk networks. According to (Steve Richmond, 2022), cloud connectivity allows for centralized oversight of software updates, security patches, and interface enhancements without needing on-site technical support at each kiosk. This ability not only lowers maintenance expenses but guarantees uniform passenger experiences across various airport settings while significantly speeding up the introduction of new features and security improvements across the network. The resulting framework establishes a basis for continuous innovation while ensuring operational stability throughout widely distributed kiosk installations.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Table 1: Tiered Processing Architecture for Aviation Kiosks (Xu, R. *et al.*, 2024; Steve Richmond, 2022)

Processing Layer	Key Functions	Resilience Features	Scalability Capabilities
Edge Computing (Kiosk Hardware)	Interface rendering, Input processing, Essential functions	Continues operation during connectivity loss, Local processing of critical functions	Device-level resource management, Offline functionality
Local Airport Servers	Regional processing, Data caching, and Kiosk cluster coordination	Reduces dependency on cloud connectivity, Minimizes latency for time-sensitive functions	Terminal-level load balancing, Resource sharing across kiosk clusters
Cloud Infrastructure	Advanced AI capabilities, Centralized data storage, System-wide analytics	Global redundancy, distributed processing, and Automated failover	Dynamic resource allocation, Automatic scaling during peak periods, Usage-based allocation models

AI-DRIVEN RESILIENCE MECHANISMS

Operational resilience is a vital necessity for aviation kiosk implementations, as system malfunctions directly affect passenger processing efficiency and may lead to wider operational disturbances. Contemporary kiosk deployments utilize artificial intelligence technologies to shift from conventional reactive maintenance methods to proactive resilience tactics that foresee, alleviate, and swiftly address possible disturbances. Predictive maintenance signifies a crucial improvement in kiosk durability, utilizing advanced machine learning techniques to consistently assess hardware performance data. These systems track various factors such as touch screen sensitivity, printer mechanism activity, network latency trends, and internal temperature variations. As noted by (Patibandla, K. R. 2024), successful predictive maintenance practices can detect failing components days or even weeks before actual failure. This early detection feature allows maintenance teams to plan interventions during low-demand times, significantly minimizing operational interruptions while prolonging the overall lifespan of kiosks through prompt component replacement. Real-time error identification and automated restoration features boost kiosk resilience by consistently observing system performance. AI algorithms set baseline operational metrics and identify variations that could signal developing software problems. Upon detecting anomalies, the system triggers a series of recovery actions, which include application restarts and database reconnections, all without the need for human involvement. Studies show that these automated recovery systems effectively address a large share of operational problems, decreasing mean time to recovery and lessening reliance on technical personnel.

One of the most innovative aspects is the use of computer vision for optimizing passenger flow and dynamic load balancing. These systems examine queue formation trends and the distribution of passengers throughout terminal spaces, allowing for smart resource distribution. As noted in (Kibsi), when congestion occurs in certain kiosk clusters, the system can automatically guide passengers to lesser-used units or turn on extra kiosks from standby mode. This smart load balancing feature guarantees effective resource use while concurrently reducing passenger wait times during busy operational times. The resulting optimization establishes a more robust overall system that can adjust to varying demand patterns while ensuring steady passenger processing abilities.

Table 2: Performance Metrics: Traditional vs. AI-Enhanced Kiosk Resilience Systems (Patibandla, K. R. 2024; Kibsi)

Metric	Traditional Systems	AI-Enhanced Systems
Mean Time to Detect Issues	Hours to days	Minutes to hours
Mean Time to Resolve	Hours	Minutes
Preventable Failures	20-30%	70-90%
Maintenance Staff Requirements	High	Moderate
System Lifespan	Standard	Extended
Passenger Processing Continuity	Vulnerable to disruption	Highly resilient

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

CASE STUDY

Implementation at Frankfurt International Airport

An extensive pilot project featuring AI-powered kiosk systems at Frankfurt International Airport provides strong evidence of the revolutionary potential of smart, cloud-connected passenger processing solutions. This deployment, recognized as one of the most ambitious projects of its nature in European aviation, provides significant insights into technical implementation approaches and concrete operational advantages gained through the integration of artificial intelligence.

The deployment included a network of advanced kiosks with cloud integration and built-in AI functionalities placed strategically across terminal zones. As noted in (Future Travel Experience, 2024), the technical structure utilized containerized microservices distributed over a hybrid cloud setup, with essential passenger processing tasks handled on local servers and sophisticated AI functions provided by top cloud service providers. This method guaranteed that crucial functionality stayed accessible even during connectivity lapses, while also allowing access to advanced machine learning features when the network conditions allowed. Kubernetes orchestration offered automated scaling, load balancing, and self-repair features that ensured system resilience in varying operational conditions.

Analysis of performance demonstrated significant enhancements in various operational aspects relative to traditional kiosk setups. The AI-powered system showed notable decreases in average passenger processing times while also reducing kiosk downtime via predictive maintenance features. Passenger satisfaction indicators demonstrated significant progress, as a large number of travelers noted improved check-in experiences. Perhaps most importantly, the system effectively sustained performance standards during a significant regional occurrence that resulted in considerable increases in passenger volume, showcasing the elastic scaling features facilitated by the cloud infrastructure.

According to (Digital Transformation Agency, 2024), the execution included various cutting-edge features that set it apart from traditional kiosk installations, such as multilingual natural language processing covering multiple languages, biometric authentication via facial recognition, and adaptable interface customization based on traveler profiles. The positive results obtained in Frankfurt have shaped kiosk modernization approaches at various global airports, creating a benchmark architecture for smart passenger processing systems that harmonize cutting-edge functionality with operational durability. This case study shows that effectively applied AI technologies can boost passenger satisfaction while increasing operational efficiency, generating significant value for both travelers and airport management.

FUTURE DIRECTIONS

Despite the promising technological trajectory, the widespread adoption of AI-enhanced aviation kiosk systems faces significant implementation challenges that airports, airlines, and technology providers must navigate carefully. These challenges represent important considerations that will shape adoption strategies and development priorities in the coming years.

Cost considerations represent perhaps the most immediate barrier to widespread implementation. The transition from conventional kiosk infrastructure to AI-enhanced systems requires substantial capital investment across multiple dimensions. As analyzed by (Steve Richmond, 2022), the hardware requirements for next-generation kiosks—including high-resolution displays, advanced processing units, and sophisticated sensor arrays—can increase unit costs by 40-60% compared to traditional systems. The cloud infrastructure necessary to support these networks introduces ongoing operational expenses that many airports with constrained budgets find challenging to accommodate. Implementation costs extend beyond hardware and infrastructure to include staff training, system integration, and potential disruptions during transition periods. Research by (Digital Transformation Agency, 2024) indicates that comprehensive staff preparation programs are essential for successful deployments but can represent 15-20% of total implementation costs. These financial considerations are particularly significant for smaller regional airports that lack the passenger volumes needed to achieve rapid return on investment, potentially creating a technological divide between major international hubs and smaller facilities.

Evolving privacy regulations present another complex challenge for future implementations. The regulatory landscape governing data

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

protection continues to become more stringent globally, with frameworks like GDPR in Europe establishing comprehensive requirements for passenger data handling. AI-enhanced systems that leverage passenger data for personalization must navigate increasingly complex compliance requirements that vary significantly across jurisdictions. As noted by (Future Travel Experience, 2024), the absence of harmonized international standards for biometric data usage creates particular challenges for systems designed to operate across multiple regions. The development of "privacy-resilient" architectures—capable of adapting to evolving regulatory requirements without fundamental redesign—represents a critical research direction. These systems must implement flexible data handling protocols that can be reconfigured based on the specific requirements of each operating environment. For global airlines that maintain kiosk networks across numerous countries, the challenge of managing different privacy compliance requirements across their networks adds significant operational complexity.

Security vulnerabilities introduce additional considerations as aviation kiosks become more sophisticated and networked. The expanded attack surface created by AI-enhanced systems—including potential vulnerabilities in machine learning models, cloud connections, and distributed processing nodes—necessitates comprehensive security strategies. According to (People10 Technologies, 2025), addressing these concerns requires sophisticated approaches including continuous vulnerability assessments, security-focused development practices, and robust encryption for data both in transit and at rest. Public perception of security and privacy risks may also influence adoption rates, as passenger confidence is essential for the acceptance of new technologies, particularly those that process sensitive personal and travel information. Addressing these perceptual barriers requires transparent communication about security measures and tangible demonstrations of system resilience.

The pathway toward fully integrated, AI-enhanced aviation kiosk systems will require balanced approaches that address these adoption challenges while delivering on the transformative potential of these technologies. Successful implementations will likely employ phased deployment strategies that manage financial constraints while demonstrating clear operational benefits and maintaining robust privacy and security postures. By thoughtfully addressing these complex challenges, the aviation industry can realize the full potential of AI-enhanced kiosk systems while ensuring these innovations remain accessible across the global aviation ecosystem.

CONCLUSION

The evolution of aviation kiosks via artificial intelligence marks notable progress in the technology for processing airport passengers. These systems provide personalized experiences by combining adaptive interfaces with cloud scalability and resilience features, ensuring operational stability despite changing conditions. The architecture of distributed intelligence—ranging from edge devices to cloud systems—forms a versatile base for advanced passenger services that tackle existing operational issues while paving the way for ongoing innovation. As intelligent kiosk networks develop to integrate multimodal biometrics, inter-airport intelligence, and advanced edge computing features, they will progressively become essential elements within holistic airport management systems instead of standalone touchpoints. This development allows airports to boost security measures while simultaneously increasing processing efficiency and passenger contentment. With the aviation sector's ongoing growth after worldwide disruptions, these smart, scalable kiosk systems will increasingly be essential in developing passenger-focused airport settings that can manage rising numbers of travelers while ensuring the operational dependability required by contemporary air travel.

REFERENCES

1. Wongyai, P. H., Ngo, T., Wu, H., Tsui, K. W. H., & Nguyen, T. H. "Self-service technology in aviation: A systematic literature review." *Journal of the Air Transport Research Society* 2 (2024): 100016.
2. Geske, A. M., Herold, D. M., & Kummer, S. "Artificial intelligence as a driver of efficiency in air passenger transport: A systematic literature review and future research avenues." *Journal of the Air Transport Research Society* 3 (2024): 100030.
3. Antwi, C. O., Ren, J., Owusu-Ansah, W., Mensah, H. K., & Aboagye, M. O. "Airport self-service technologies, passenger self-concept, and behavior: An attributional view." *Sustainability* 13.6 (2021): 3134.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

4. People10 Technologies, "Cloud Computing in Aviation: The Game-Changer for Airlines," (2025). https://people10.com/cloud-computing-in-aviation-the-game-changer-for-airlines/
5. Yang, C., & Huang, C. "Natural language processing (NLP) in aviation safety: Systematic review of research and outlook into the future." *Aerospace* 10.7 (2023): 600.
6. Zhan, X., Xu, Y., & Liu, Y. "Personalized UI layout generation using deep learning: An adaptive interface design approach for enhanced user experience." *International Journal of Engineering and Management Research* 14.5 (2024): 134-147.
7. Xu, R., Nagothu, D., & Chen, Y. "AR-Edge: Autonomous and Resilient Edge Computing Architecture for Smart Cities." *Edge Computing Architecture-Architecture and Applications for Smart Cities*. IntechOpen, (2024).
8. Steve Richmond, "How Cloud Technology Can Enhance Your Airport Experience," *Forbes Technology Council, Forbes*, (2022). https://www.forbes.com/councils/forbestechcouncil/2022/03/03/how-cloud-technology-can-enhance-your-airport-experience/
9. Patibandla, K. R. "Predictive maintenance in aviation using artificial intelligence." *Journal of Artificial Intelligence General Science (JAIGS)* 4.1 (2024): 325-333.
10. Kibsi, "Revolutionizing Airport Operations with Computer Vision: Efficiency and Safety Take Flight with Kibsi,". https://www.kibsi.com/misc/computer_vision_solutions_for_airports_demo/
11. Future Travel Experience, "How Fraport's innovative AI@FRA initiative is enhancing operational capabilities and passenger experience," (2024). https://www.futuretravelexperience.com/2024/09/how-fraports-innovative-aifra-initiative-is-enhancing-operational-capabilities-and-passenger-experience/
12. Digital Transformation Agency, "Digital Transformation Agency Annual Report 2023–24," (2024). https://www.dta.gov.au/sites/default/files/2024-10/Digital%20Transformation%20Agency%20Annual%20Report%202023-24.pdf
13. Ammour, N., Bazi, Y., & Alajlan, N. "Multimodal approach for enhancing biometric authentication." *Journal of Imaging* 9.9 (2023): 168.
14. Procter, S. "The Role of AI and Machine Learning in Airport Resource Optimization," Copenhagen Optimization, (2025). https://copenhagenoptimization.com/blog/the-role-of-ai-and-machine-learning-in-airport-resource-optimization/

Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Karnam, V. S." Enhancing User Experience and Resilience Through System Scalability for Transforming Aviation Kiosk Systems Using Artificial Intelligence." *Sarcouncil Journal of Engineering and Computer Sciences* 4.7 (2025): pp 738-745.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher