

Balancing Security and Privacy: A Study on Biometric Authentication Implementation in Airports and Airlines

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Abstract: *Biometric authentication is increasingly adopted in airports to enhance security and operational efficiency. While offering significant advantages, such as accurate identity verification and expedited passenger screening, it raises concerns over data privacy and security. This study examined the implementation of biometric systems in Philippine airports, focusing on the balance between security benefits and privacy protection. A mixed-methods approach was employed, combining surveys with passengers, interviews with key stakeholders, and case studies of airports utilizing biometric technology. Results indicated that biometric systems significantly improved identity verification accuracy, reduced fraud, and streamlined passenger flow. However, 60% of passengers expressed privacy concerns, particularly about data storage and unauthorized access. Best practices, including data minimization, secure storage, and informed consent, were identified as effective strategies to address these concerns. The study concluded that while biometric technology offers transformative benefits, its success depends on transparent communication, robust privacy safeguards, and compliance with regulations. Recommendations include adopting time-limited data retention policies, enhancing passenger awareness, and offering opt-out options. Future research should explore longitudinal impacts of biometric systems, privacy-preserving technologies, and cross-country regulatory comparisons to establish global best practices for biometric implementation.*

Keywords: Biometric authentication, airport security, data privacy, passenger trust, privacy safeguards