

Enhancing Employee Awareness to Mitigate the Economic and Operational Impacts of Unlawful Interference in Abu Dhabi

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Abstract

Awareness of unlawful interference is pivotal for enabling employees to effectively manage and mitigate its impacts on critical areas such as flight delays and cancellations, maintenance and repairs, tourism, stocks, and investments. A thorough review of past studies, this paper aims to identify the significance of unlawful interference and employee's readiness in Abu Dhabi Airport. The findings of this review reveal that employee awareness is fundamental in reducing flight delays and cancellations, which often result in substantial costs associated with overtime, rescheduling, and operational disruptions. Similarly, employees equipped with knowledge of maintenance and repair protocols can detect potential threats early, avoid unnecessary repairs, and ensure efficient resource utilization at AUH. In the tourism sector, employee readiness to handle security incidents fosters a perception of safety among travelers, encouraging confidence in airport operations. As a vital gateway to the region, AUH plays an essential role in supporting tourism-related industries, such as hospitality and retail. Airports demonstrating robust security through trained employees are better positioned to sustain tourist inflows and support economic growth. Moreover, awareness among employees plays a vital role in stabilizing stocks and investments, as effective management of security threats reassures investors, thereby maintaining confidence in the aviation and tourism sectors. This is particularly important for AUH, which continues to attract global investments as part of its strategic positioning as a leading aviation hub. Future research should delve deeper into how employee awareness of passenger-targeted attacks, airport infrastructure attacks, and false information can enhance their preparedness to control and

mitigate the effects of these threats. For instance, investigations could focus on how awareness influences their ability to address the economic impacts of delays, support the tourism industry, and maintain airport infrastructure and maintenance at AUH.

Keywords: Awareness, Unlawful, Interference, Economic, Operational, Impacts

Introduction

Civil aviation plays a vital role in global trade, tourism, and connectivity. As one of the principal global industries, it relies on complex systems encompassing airports, passengers, infrastructure, airplanes, and navigation technologies. Civil airports serve as key hubs, emphasizing the critical need to secure these facilities against unlawful interference. Such acts have far-reaching consequences beyond immediate costs, including disruptions to supply chains, reduced passenger confidence, increased insurance premiums, and heightened security measures (Korecki & Heike, 2022). Moreover, these disruptions impact tourism, trade, and political relations, compounding social and security challenges on national and regional levels (Martin, 2018). Ensuring the security of civil airports is, therefore, essential for passenger safety and economic resilience. Maslow's hierarchy of needs underlines the importance of safety as a basic human requirement (Kremer, 2013). In aviation, passengers' sense of safety directly influences their willingness to travel and pay for services (Panter, 2021). Several historical incidents have reshaped airport security measures. The Lockerbie bombing of 1988, where a flight from London to New York exploded due to a bomb, killed all passengers and crew onboard as well as 11 Lockerbie residents. This tragedy led to the implementation of the baggage reconciliation system, a landmark security improvement in aviation history (Moore, 2020). The 9/11 terrorist attacks marked a turning point in aviation security. Al-Qaeda's hijacking and use of commercial aircraft to target prominent U.S. structures resulted in 2,977 fatalities and prompted significant changes in global airport security protocols. Post-9/11 measures included enhanced passenger screening, advanced security personnel training, and extensive baggage checks using modern detection systems such as EDS and ETD machines (Blalock, 2007). These measures improved security but imposed additional economic burdens on airlines and operators, highlighting the financial trade-offs involved in ensuring safety. Turkey has also faced significant aviation security challenges. The Sabiha Gokcen Airport bombing in 2015, followed by the 2016 Ataturk Airport attack, underscored vulnerabilities in airport security. These incidents prompted debates about checkpoint placement, rigor, and the economic costs and benefits of various security measures. In response, Turkey implemented stricter checkpoint protocols, requiring vehicles and individuals to stop at a distance from airport terminals for preliminary screenings. While effective in enhancing security, these measures introduced delays and inconveniences for travelers (Tan, 2016). From 1970 to 2015, there were 1,363 recorded terrorist attacks on airports and aircraft, with additional incidents in subsequent years. Experts predict over six billion air passengers annually by 2030, highlighting the aviation industry's continued vulnerability to unlawful interference (Szymankiewicz, 2022). Such attacks, aside from causing fatalities, have profound social, political, and economic implications (Duchesneau, 2015). To address these challenges, this research examines significant aviation security incidents and their impacts on safety and economic dimensions, summarized in Table 1.

Table 1

Major Aviation-Related Hijacking and Bombing Incidents (1970-2025) with Casualties

Year Range	Incident (Exact Year)	Location	Deaths
1970-1979	Dawson's Field Hijacking (1970)	Zarqa	1
1980-1989	Lockerbie Bombing (1988)	Lockerbie	270
1990-1999	FEDEX Hijacking Attempt (1994)	Memphis	0
1990-1999	Ethiopian Airline Hijacking (1996)	Addis Ababa	123
2000-2009	US Famous Incident Attack (2001)	New York City	2997
2000-2009	Shoe Bomber Attempt (2001)	Paris/Miami	0
2000-2009	Underwear Bomber (2009)	Detroit	0
2010-2019	German Suicide Hijacking (2015)	French Alps	150
2010-2019	Brussels Airport Bombing (2016)	Brussels	32
2010-2019	Ataturk Airport Bombing (2016)	Istanbul	42
2020-2025	Dubai International Airport Closure (2016)	Dubai	0

The frequency and severity of airport attacks worldwide underscore their significant impact on both communities and individuals. These incidents not only highlight vulnerabilities in aviation security but also necessitate a deeper understanding of their economic consequences. The ripple effects of such events, including disruptions to flights, increased maintenance costs, and diminished tourism revenue, demand focused research to explore how airports can better prepare for and respond to these challenges. Despite the prevalence of these incidents, there remains a critical gap in research addressing the role of employee awareness in mitigating their effects, especially in Dubai Airport. Comprehensive studies examining how employee readiness and knowledge about different types of attacks influence airport security protocols and passenger perceptions are scarce. Moreover, the interplay between employee preparedness and the economic dimensions of attacks—such as delays, cancellations, and the broader financial stability of the aviation industry—is poorly understood. False information and communication during security crises further complicate the situation. These factors can amplify disruptions and erode passenger trust, yet their management is seldom studied in conjunction with employee training and readiness.

Dubai Airport (DXB)

Dubai Airport is one of the world's busiest and most popular airport hubs (Dubai Airports [DXB], 2019). The continuous growth in air transport has driven the demand for enhanced airport services, which, in turn, necessitates more efficient airport terminal operations. The airport terminal is a critical part of the airport system, as increased congestion can lead to flight delays and negatively impact passengers' perceptions of the service level. The terminal manages the movement of passengers and cargo into and out of the country. The number of passengers using Dubai Airport has steadily increased over the past six years, with some years

experiencing double-digit growth (DXB, 2019). In 2019, a projected 90 million passengers were expected to pass through, putting increasing pressure on the existing systems. This growth has highlighted the need for efficient organizational management to support the safe and smooth running of operations. Passenger traffic has shown an average year-on-year growth of about 7.62%, while cargo has grown at approximately half that rate. Passenger growth in 2013 was around 15.2%, decreasing to 1% in 2018, with similar growth projected for 2019. Even though passenger numbers dropped in 2019, 2021, and 2022 due to the COVID pandemic, DXB is on track to surpass pre-pandemic levels by May 2023 (DXB, 2023). The safety of passengers remains central to the airport's operations.

Table 2

DXB Passenger and Cargo Statistics (2013-2022)

Year	Passengers	y-o-y Growth (%)	Cargo (Units)	y-o-y Growth (%)
2022	66,000,000	127%	1,700,000	25.50%
2021	29,100,000	12.70%	2,300,000	20.00%
2020	25,000,000	-70.00%	1,932,022	-23.20%
2019	86,396,757	-3.10%	2,514,918	-4.80%
2018	89,149,387	1.00%	2,641,383	-0.50%
2017	88,242,099	5.50%	2,654,542	2.40%
2016	83,654,250	10.70%	2,592,454	3.40%
2015	78,014,838	7.20%	2,506,092	3.40%
2014	70,473,893	6.10%	2,423,677	-3.10%
2013	66,431,533	15.20%	2,443,624	6.80%

In addition to serving as a gateway for entry and exit, the airport plays a crucial role in accommodating large volumes of passengers at any given time (Manataki & Zografos, 2010). To meet these demands, organizational management factors, Principles, Policies, Procedures, and Practices (the 4Ps)—are essential to building a resilient safety culture at DXB. These factors provide the framework for effective airport management and safety practices. Despite the growing body of research on unlawful interference in civil aviation, very few studies have specifically investigated its implications for Dubai International Airport (DXB). Furthermore, no studies to date have paid attention to Abu Dhabi International Airport, another critical hub in the region. Therefore, this study aims to address this gap by focusing on Abu Dhabi International Airport, exploring how unlawful interference impacts its operations and proposing strategies to enhance resilience and security measures.

Importance of Employee Awareness and Training

Grounded in Protection Motivation Theory (PMT; Rogers, 1997), this research emphasizes the importance of increasing employee awareness to proactively manage risks. Prepared employees can effectively mitigate threats, ensure smooth operations, and reduce costs related to unexpected repairs, thereby supporting Dubai's economic stability (Hanus & Wu, 2016). For instance, passenger-targeted attacks in high-traffic areas like waiting lounges and security checkpoints not only erode public confidence in airport safety but also discourage travel, adversely impacting the tourism sector (Sun, Wandelt, & Zhang, 2020).

Economic Consequences of Security Lapses

For a globally prominent hub like DXB, any security event can disrupt aviation networks, tourism, and related industries. Employee readiness to detect and address threats is pivotal in maintaining passenger trust and sustaining economic activity (Al Jasmi et al., 2021). Similarly, attacks targeting airport infrastructure often necessitate urgent repairs, leading to unplanned expenditures and operational slowdowns. For instance, DXB's multi-terminal layout makes it particularly vulnerable to disruptions, amplifying operational strain during emergencies (Sun et al., 2020).

A notable incident, such as the 2020 drone sighting, illustrates the importance of training employees in rapid response protocols to ensure continuity and prevent future interruptions (Burlov et al., 2022). Well-trained staff can efficiently allocate resources, lower maintenance expenses, and optimize passenger flow, all of which are essential to safeguarding DXB's position as a leading international hub.

Challenges of Misinformation

False information regarding security threats or operational issues constitutes another significant challenge. As Dubai relies heavily on tourism, any damage to its reputation caused by misinformation could reduce tourist arrivals, affecting the hospitality and retail sectors (Al Jasmi et al., 2021). Proper training empowers employees to manage misinformation effectively, ensuring that they can reassure passengers and stabilize bookings during crises. This proactive approach protects Dubai's economy from unnecessary disruptions tied to rumors or false reports.

Financial Implications of Flight Delays and Cancellations

Flight delays and cancellations represent one of the most immediate economic impacts of unlawful interference. These disruptions increase operational costs through overtime payments, rescheduling efforts, and additional fuel consumption (Calzada & Fageda, 2023). For DXB, which handles a high volume of connecting flights, such delays are particularly costly. Employees with comprehensive emergency response training can reduce downtime, preserve operational efficiency, and reinforce the airport's reputation for reliability (Wandelt & Wang, 2024).

Maintenance and Repair Costs

Unlawful acts often lead to heightened maintenance demands for aircraft and infrastructure. For instance, sabotage or other physical damage necessitates costly repairs and extended downtime. For a facility as high-capacity as DXB, frequent disruptions could strain resources. By fostering a proactive workforce capable of detecting threats early, DXB can lower maintenance costs, prevent unnecessary repairs, and ensure operational continuity.

Impacts on Tourism and Investment

Dubai's tourism industry, which heavily depends on DXB's smooth operation, also suffers when unlawful acts disrupt airport activities. As the principal entry point for international visitors, DXB plays a crucial role in supporting the UAE's economy. Perceived safety issues or excessive delays can deter travelers, reducing tourist spending and impacting related sectors such as hospitality and retail (Rashad et al., 2024). By equipping employees with preventive

training, DXB can create a secure and welcoming environment, reinforcing Dubai's reputation as a reliable travel destination.

Security incidents at airports also affect stock prices and investment in the aviation and tourism sectors. For example, lapses in security at DXB could result in adverse market reactions, reflecting investor sensitivity to perceived risks. Demonstrating effective threat management through a well-trained workforce can stabilize investor confidence, encouraging sustained investments and economic growth (ATAG, 2018).

Role of Managerial Security Procedures

Managerial security procedures are critical for enhancing airport performance (Alards-Tomalin et al., 2014). These measures moderate the relationship between employee awareness of threats, such as passenger-targeted attacks and misinformation, and the economic stability of the airport. Structured protocols, including rapid reporting mechanisms and emergency response drills, ensure that employees act efficiently and decisively during security threats. Such practices minimize disruptions, protect airport operations, and reduce costs associated with delays and repairs (ATAG, 2018).

Construct	Operational Definition	Reference
Attack on Passengers	This construct represents airport staff's awareness, preparedness, and training concerning potential attacks specifically targeting passengers at the airport. This includes knowledge of threat types, safety protocols, and procedures to respond to such incidents.	(Jacek Skorupski and Uchroński, 2018)
Attack on Airports	This construct encompasses airport staff's knowledge of potential threats to airport infrastructure, including bomb threats and cyber-attacks, as well as their confidence in identifying and managing such threats. Training on handling critical emergencies also falls under this construct.	(Ghelfi-Waechter et al., 2019)
False Information/Communication	This construct covers the staff's ability to detect, report, and manage false or misleading information that may impact airport operations and passenger safety. It includes training to handle misinformation that could cause confusion or security threats.	(Walter, Schmutz and Grote, 2024)

Control Economic Effects of Flight Delays and Cancellations	This construct reflects efforts to minimize the economic impacts of flight delays and cancellations through efficient communication with passengers, resource management, and strategies to prevent operational disruptions.	(Rosenow et al., 2020)
Airports and Aircraft Maintenance and Repairs	This construct involves actions taken by staff to report security threats early, follow safety protocols, and coordinate departments to minimize maintenance costs and avoid unnecessary repairs. It includes managing disruptions effectively.	(Endsley and M. Robertson, 2000)
Tourism	This construct reflects airport operations that contribute to a positive tourist experience by ensuring smooth operations, minimizing disruptions, and maintaining reliability in airport services, all of which encourage tourism.	(Koros, 2017)
Stocks and Investment	This construct highlights efforts to protect the airport's financial performance and investor confidence through early threat detection, reliable operations, and quick response to disruptions, preventing unnecessary financial instability.	(Carney and Mew, 2003)
Managerial Security Procedures	This construct involves the role of airport management in developing, updating, and enforcing comprehensive security policies, training, and communication channels to ensure the effective handling of security incidents and compliance across the organization.	(J. Skorupski and Uchroński, 2018)

Future Research

Future research should focus on enhancing employee awareness to prepare staff for potential threats, including attacks on passengers, airport infrastructure, and false information. This research should explore how employees at major international hubs like Abu Dhabi International Airport (AUH) and Dubai International Airport (DXB) can effectively manage the economic impacts of such threats, particularly in areas like flight delays and cancellations, airport and aircraft maintenance, tourism, and investments. Additionally, the role of managerial security procedures as moderators should be further investigated to understand their impact on amplifying the effectiveness of employee awareness programs.

One area for future study is the development of training frameworks that equip employees with the skills needed to respond to various threats. At both AUH and DXB, employees should receive specialized training to address attacks on passengers in high-traffic zones such as waiting lounges, check-in counters, and security checkpoints. Practical simulations and scenario-based exercises can enhance their ability to manage potential threats efficiently and

maintain passenger safety. Similarly, training programs should focus on enabling employees to identify vulnerabilities in airport infrastructure and facilities, preparing them to respond proactively to threats targeting critical systems. In particular, AUH, as a rapidly expanding aviation hub, presents a unique opportunity for research into how employee training can be tailored to its distinct operational context.

False information is another significant area of concern, and future research should explore methods to train employees to manage misinformation during crises at both airports. Strengthened communication protocols can ensure operational stability by preventing the spread of panic and maintaining public confidence. For example, AUH's strategic position as a gateway between the East and West underscores the importance of resilient communication systems that mitigate the impact of false information on global transit networks.

The economic consequences of unlawful interference at airports highlight the need for further investigation into how employee awareness can mitigate these impacts. For instance, delays and cancellations not only disrupt operations but also incur significant costs in terms of rescheduling, overtime, and fuel. Research should focus on how employees trained in emergency response protocols can minimize these disruptions and ensure effective communication with passengers to reduce financial losses. At AUH, where growth in passenger numbers is fueling infrastructure development, early threat detection by employees could prevent unnecessary repairs and reduce maintenance costs for airports and airlines.

Studies should also examine how employee preparedness contributes to sustaining tourism by reassuring travelers and promoting confidence in airport safety. Both AUH and DXB serve as critical tourism gateways in the region, making their employees' roles essential in maintaining a safe travel environment. Furthermore, future research could explore the influence of employee awareness on maintaining investor confidence in the aviation and tourism sectors, particularly during security incidents. Demonstrating robust threat management at AUH and DXB can mitigate fluctuations in stock prices and encourage continued investment.

Managerial security procedures play a pivotal role in moderating the relationship between employee awareness and the successful handling of security threats. Research should investigate how comprehensive policies, emergency response drills, and effective communication channels enhance employee performance during crises at both airports. For example, updated and clearly defined security policies provide employees with actionable guidelines, while regular drills ensure their readiness to respond swiftly to potential threats. Communication frameworks, both internal and external, are essential for preventing misinformation and ensuring coordinated responses. Future studies should also evaluate the role of compliance monitoring and adherence to international safety standards in aligning security practices with global benchmarks, particularly at AUH as it seeks to position itself alongside DXB as a world-leading hub.

To strengthen airport security further, it is recommended that organizations develop targeted training modules tailored to specific threats, such as passenger attacks, infrastructure

sabotage, and misinformation management. These programs should incorporate practical simulations and cross-departmental collaboration to enhance real-world preparedness. Additionally, airports like AUH and DXB should invest in advanced technologies, such as AI-driven threat detection and predictive analytics, to complement human readiness. Regular updates to security policies and procedures, informed by feedback from employees, are essential for ensuring their continued relevance. Collaborative efforts between airport authorities, airlines, and government agencies should also be prioritized to create holistic security approaches that leverage shared resources and intelligence.

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