



FROM SILOS TO INTEGRATION

Digital Transformation at Taoyuan International Airport, Taiwan

Airports around the world have embarked on the demanding journey of digital transformation. Digital transformation supports a more connected airport system, optimization of airport processes and the connectivity of passengers. Not least, it forges a path for big-data solutions to help airlines, airports and airport managers gain insights into passenger flow, reduce costs and enhance non-aeronautical revenue streams.

Digital transformation touches practically every aspect of airport systems and operations. It is manifested as improved wayfinding, self-service offerings and location-based services to support passenger journeys. Behind the scenes, airport collaborative decision-making (A-CDM) platforms support current processes and provide a platform for future operational enhancements.

The journey of digital transformation requires investment, careful planning and a shift from legacy siloed systems to integrated systems and processes. Integration enables collaborative frameworks that nurture agile working environments—where people can quickly adapt plans to respond to current operational realities. This capability is essential as airports handle increasing numbers of passengers; and, as systems become even more complex, agility is key to providing personalization, convenience, comfort, security and safety in travel.



Forming Collaborative and Agile Working Environments

For Taoyuan International Airport (TIA), Taiwan's largest airport, digital transformation underpins the airport's mission of becoming a hub for East Asia. A fundamental part of TIA's journey is implementing a state-of-the-art A-CDM platform designed to optimize the use of land resources and management of aircraft. The A-CDM portal provides opportunity for platform partners to share real-time data for situational awareness of airport and airline operations. These stakeholders include airport operators, air traffic control, airlines, ground handlers, security and border control. A comprehensive common understanding from shared data fosters greater predictability of air traffic and thus more efficient planning and use of resources.

An aircraft tracking system, which connects back to the A-CDM, includes a unique electronic wheel chock concept. Built-in sensors feed airplane position and movement back to the A-CDM platform, and this data supports better management of aircraft and accuracy in billing (based on an aircraft's time in the apron).

By working collaboratively through the exchange of timely information, A-CDM partners can prevent or address potential disruptions to operations, which may arise from a variety of events, including work on airport infrastructure, poor weather or the movement of eminent people into or out of the airport.

Overall, the A-CDM platform enables TIA to handle the growing number of travellers through its terminals, which reached 46.5 million in 2018. Airport operators can determine the exact location and availability of TIA assets and people working in the airport—from point of entry through the facility to airside—and make informed decisions that improve efficiencies.

Evolving into a Smart Airport

To enhance passenger flow, TIA automated its terminal processes beyond self check-in kiosks and self-baggage drops. The vanguard single-token biometric boarding system, now available through a pilot program in TIA's Terminal 1 and Terminal 2, will facilitate a seamless passenger experience throughout the entire airport. This capability is designed into Terminal 3 (T3), which is now under development. T3 is expected to boost the number of TIA passengers to 80 million per year by 2042.

Digital transformation also involves upgrading multiple operational systems, such as TIA's flight information display system, resource management system, baggage handling system and the future air navigation system. This digitization, coupled with 5G-ready infrastructure, will establish the foundation for a smart airport—where technology advances airport processes and services to create personalization, convenience and comfort for passengers in a safe and secure environment.

At TIA, a CEO-led digital transformation program has been fundamental to progress. Communicating a vision for the airport and the

purpose of specific digital changes to airport stakeholders at all levels has been essential to developing a digital culture and evolving into a smart airport.

Realizing the Vision

As TIA develops T3 (with a scheduled opening in 2025), the airport continues to modernize Terminals 1 and Terminal 2 with smart sensors (beacons) to track and analyze data derived from flights, passengers and luggage, and to shift from legacy to integrated systems and processes.

To stimulate an airport economy, a recently launched airport app informs and guides people regarding available services at TIA. Artificial intelligence is in use, with robots serving tea and offering information to passengers; and the airport is considering equipping robots with cameras to support security.

All these initiatives coupled with T3 development define TIA's digital transformation journey. This journey is essential to becoming the air travel hub for East Asia, and creating a smart airport region where passengers, businesses and the community can thrive.

Journeying to Future Ready

Creating a smart airport involves a myriad of variables. Moving from siloed to integrated systems and processes—to cultivate agile planning and decision-making—is enabling TIA to better serve customers today while positioning the airport to handle projected air travel growth and meet new passenger expectations tomorrow.

Author

Frank Kung-Ping Lin
General Manager, Taiwan
Frank.Lin@wsp.com

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