

Incheon Airport DX Strategy

Incheon Airport has implemented a holistic DX strategy across all operations

Airport-wide Initiative



"We will mobilize the airport's full capabilities to accelerate digital transformation across its entire operational ecosystem."

- CEO Mr. Lee Hag-Jae(May 2024)

DX Innovation Framework

VISION

Incheon Airport: A Game Changer Transforming the World

Governance

(11 items)

Culture

(9 items)

Action items

(31 items)

- Digital Maturity Assessment Framework
- Performance Management for IT Project
- Accelerating IT Project Process
- Cultivating Digital-Ready Culture
- DX-driven Innovation Task Group
- Airport Operation : TAM, Robotics
- Passenger Service : OneID, Commerce Platform
- Infrastructure : 5G Connectivity, Digital Twin
- Workplace : AI Platform

Airport DX Maturity Assessment Model

A shared framework can empower airport to assess, compare, and accelerate their DX journey

Why an Airport DX Framework?

- Currently, there is no standardized framework to evaluate digital maturity across airports globally
- Traditional DX models(BCG DAI, DQ..) are tailored to manufacturing, finance ...



**Airport-specific needs
are not reflected**

ICN DX Assessment Journey

Development and Assessment/Phase 1
- Digital maturity
(Dec. 2023)



Development and Assessment/Phase 2
- Digital maturity and Capability
(Sep. 2024)



Enhancement of the Assessment Model
through Expert Consultation
(Aug. 2025)

How is it structured?

- ① **Digital Technology and Infrastructure**
 - Digital Twin, AI, Smart Mobility, IoT Sensor, High-Speed Communication
- ② **Data-Driven Operations**
 - Data Quality, Data Governance, Integrated Data Platform
- ③ **Service Digitalization & Passenger Experience**
 - Biometric, Self-Service Implementation, Mobile Service
- ④ **DX Strategy and Investment**
 - DX Strategy, Open Innovation, Partnership
- ⑤ **Organization and Talent**
 - Agile, DX Organization, DX Literacy Training

Airport DX Maturity Assessment Model

Web-based assessment with AI insight and benchmarking

End-to-End Web Platform

Evaluate Airport Indicators

1. Level of Digital Twin Implementation

A Digital Twin is a powerful tool that mirrors real-world physical assets in a virtual environment. It enables airports to be monitored and simulated, thereby improving efficiency across design, construction, planning, and operations. This indicator evaluates the maturity level of digital twin implementation, from geospatial information setup to full CPS (Cyber-Physical System) integration.

[Area] Digital Technology and Infrastructure
[Core Indicator] Yes

1Score - Partial geospatial data established (2D)
 2Score - Complete geospatial data coverage for the airport (2D/3D)
 3Score - Integration and real-time monitoring of passenger flow and facility data into a digital twin platform
 4Score - Simulation of passenger flow and facility data via a digital twin platform
 5Score - Full simulation and physical control environment established using a digital twin (CPS)

Evaluator Comment
Digital twin systems are used in key facilities for reporting real-time monitoring and simulations.

Best Practice (optional)
Solaris International Airport, a full-scale digital twin platform models real-time conditions across terminal facilities, aircraft stands, passenger flows, and energy consumption.

Upload evidence (PDF or ZIP)
파일 선택 선택된 파일 없음

(Large red diagonal watermark: <EXAMPLE>)

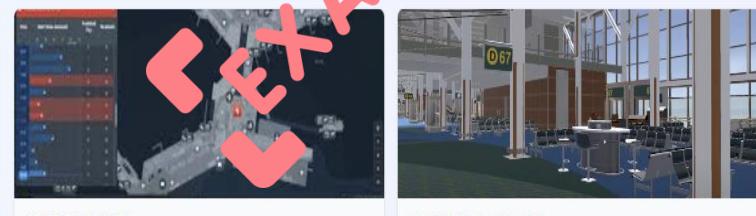
AI-Powered Best Practices

Best Practice

D1 Best Practice Score 4.0Point

Vancouver International Airport (YVR) in Canada has implemented a digital twin using real-time 3D technology (Unity), becoming the first in North America to integrate real-time operational data across the entire airport, including outside areas and terminals. This digital twin is actively used by over 200 operations staff through a runtime application and provides real-time operational insights to more than 600 airport employees. It facilitates efficient handling of maintenance, safety, and sustainability challenges. By linking real-time and historical data, it supports data-driven decision-making and interdepartmental collaboration, ultimately transforming overall airport operations and passenger experience.

(Large red diagonal watermark: <EXAMPLE>)



VVR 디지털트윈 플랫폼
VVR 여객터미널 3차원 모델링

Benchmarking Insights



- All processes including data submission, assessment, and results are fully web-based
- Generative AI collects and presents global airport best practice cases
- Provides positioning against industry average and leading airports

Airport DX Maturity Assessment Model

Expert guidance with automated PDF reporting

Expert-Driven Strategy

D1. Level of Digital Twin Implementation

A Digital Twin is a powerful tool that allows airport physical assets in a virtual environment. It enables airports to be monitored and controlled, thereby improving efficiency across design, construction, planning, and operations. This indicator evaluates the maturity level of digital twin implementation, from scratch (minimum setup) to full CDS (Cloud-Physical Systems) integration.

Score

- 1 Score: 0.00 - 1.00 (Digital twin basic implementation)
- 2 Score: 1.00 - 2.00 (Complete integrated data coverage for the airport (DPS))
- 3 Score: 2.00 - 3.00 (Integration and flow monitoring of passenger flow and building usage via digital twin platform)
- 4 Score: 3.00 - 4.00 (Optimization of airport flow and building data via digital twin platform)
- 5 Score: 4.00 - 5.00 (Full integration and physical control/reaction implementation using a digital twin (CDS))

Comment

Comments and feedback for the assessment, including suggestions for improvement and best practices.

File Upload

Upload files related to the digital twin implementation, such as reports, screenshots, or diagrams.

Best Practice

Links to best practices and case studies from other airports.

EXAMPLE

Digital Transformation Roadmap

Strategic Implementation Plan for Enhanced Digital Maturity

1 SHORT-TERM IMPLEMENTATION
1 to 3 months | Innovation Building & Quick Wins

The low-hanging fruit in the Digitalization and Customer Experience and Organization and Talent areas require rapid improvement. Quick Response (QR) tools, mobile applications, and digital signage for departure hall congestion guidance, along with the expanded adoption of social media platforms and alternative AI-based chatbot services, can rapidly enhance passenger experience. In addition, the introduction of an omnichannel strategy is essential, extending beyond the current use of Instagram, YouTube, and Facebook to include channels tailored for Asian markets. Within the airport, digital tools that enable the direct collection of passenger feedback are also needed to strengthen engagement.

2 MID-TERM DEVELOPMENT
6 months to 1 year | Integration & Expansion

In the area of Digital Technology and Infrastructure, a key mid-term strategy is the implementation of digital twins. A digital twin is a system that visualizes real-time collected data based on digital spatial information, and when integrated with BIM and IoT platforms, it can significantly maximize the efficiency of airport operations. However, successful adoption requires careful consideration of future expectations, such as synchronization and simulation. In the area of Organization and Talent, although the target airport established a dedicated digital transformation unit in 2025, its effectiveness remains limited due to insufficient KPIs and budget authority. Addressing these gaps is necessary to enhance execution capability.

3 LONG-TERM TRANSFORMATION
1 to 3 years | Innovation & Leadership

As a long-term strategy, the expansion and planning of high-speed communication networks (5G/6G), along with cybersecurity measures to prepare for the era of quantum computing, are essential. While the target airport is advancing digital transformation through partnerships with domestic companies, leading international airports are driving transformation by maintaining partnerships with global firms (e.g., Changi-AWE, Hamad-Gemini). Furthermore, advanced airports are aggressively pursuing AI talent acquisition for the future. The target airport should benchmark these practices and pursue talent development and recruitment in parallel to strengthen its competitive edge.

Success depends on systematic implementation, stakeholder alignment, and continuous performance monitoring.

EXAMPLE

Automated Reporting



Incheon International Airport

Digital Transformation Assessment Report

May 2025

Prepared by Incheon International Airport Corp.



- Provides domain-specific strategies with short- and long-term DX roadmaps

- Final results are generated as professional PDF reports