



Implementing a GIS Powered Digital Twin at Dallas Fort Worth (DFW) International Airport

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willow
know your world



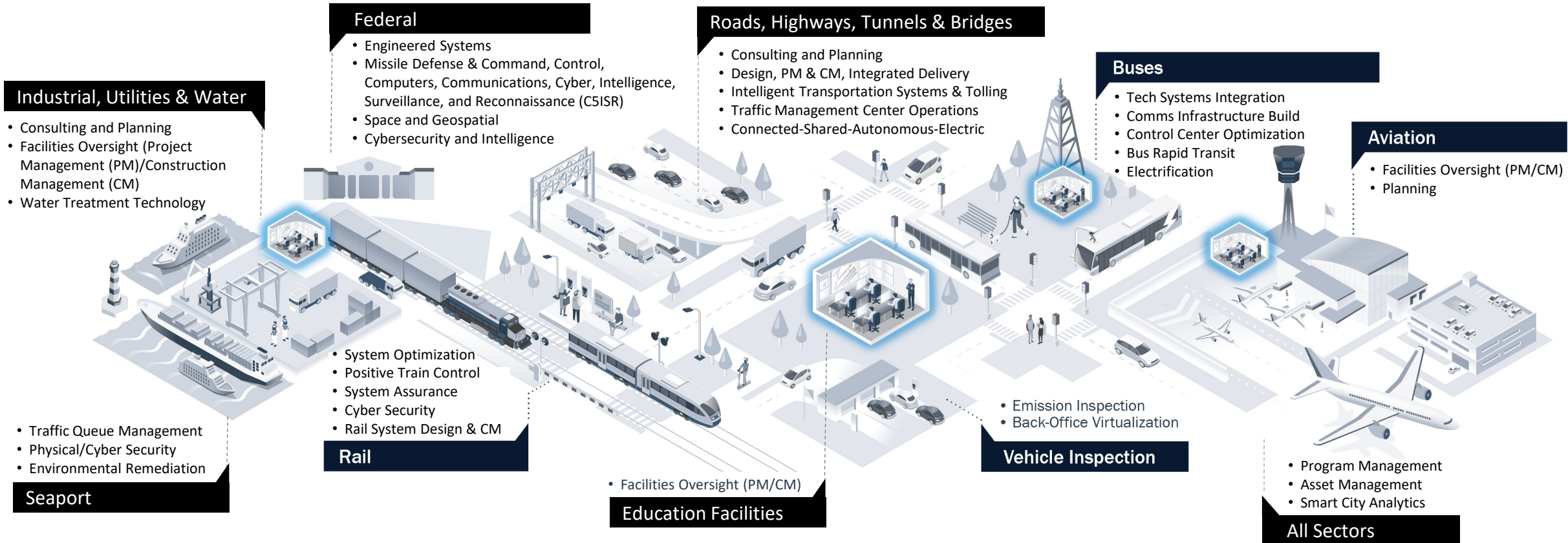
MOYE
CONSULTING



PARSONS

DFW

About Parsons

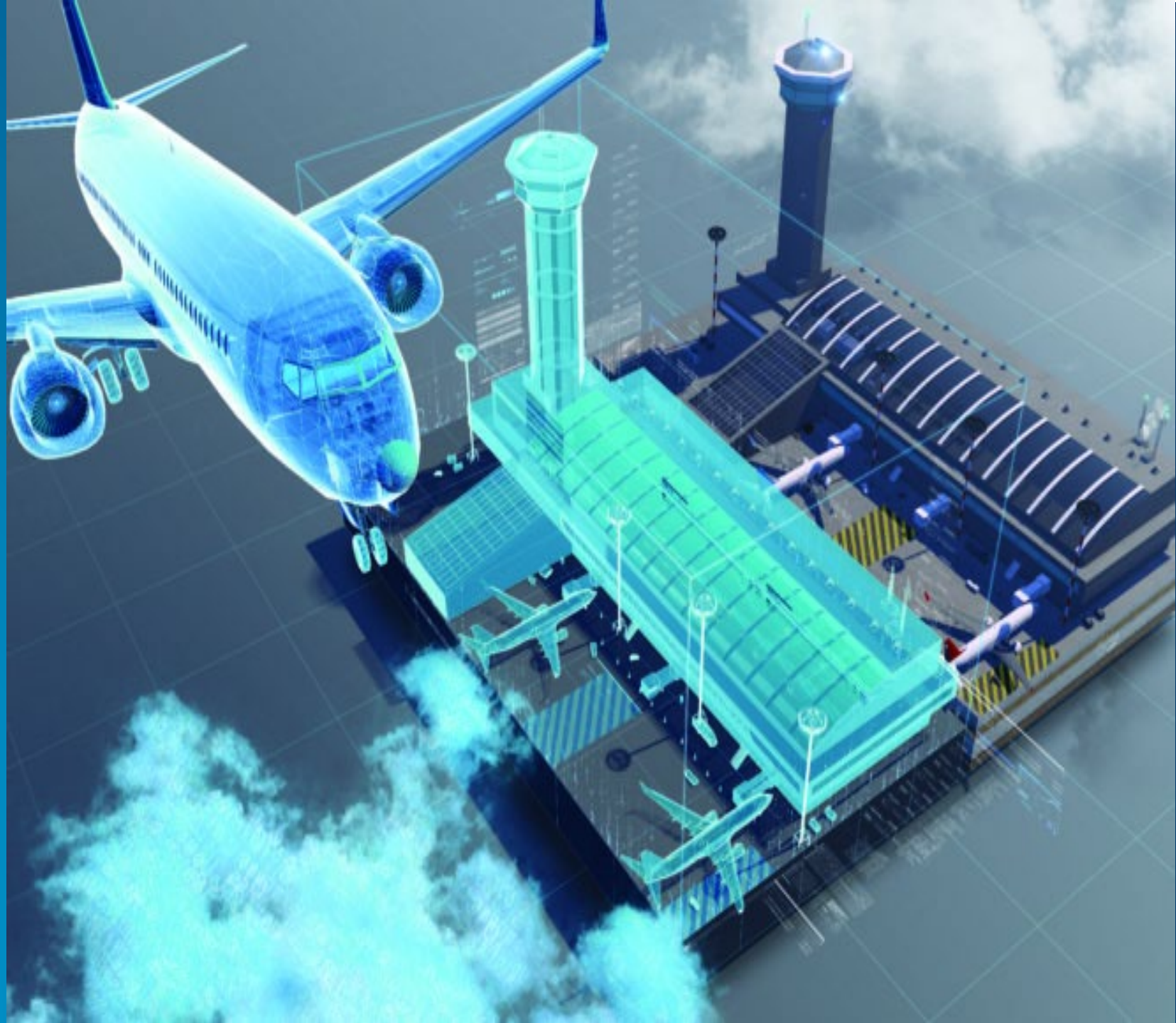


Parsons provides digitally enabled solutions and services for Aviation, Transportation, Rail, Ports, Utilities, US Federal Agencies, the Department of Defense, and municipalities worldwide. We help foster the digital transformation of critical infrastructure by delivering GIS Systems, Program Management Information Systems, Enterprise Asset Management Systems, and Smart City Analytics.

About Willow

**Willow is the “digital twin”
for the built world.**

By creating a digital replica of an asset that collects and aggregates data into a “twin”, Willow enables infrastructure owners and operators to make proactive, data-led decisions in real time, to grow profits, reduce expenses and better manage risk.



Dallas-Fort Worth (DFW) Airport Overview

- Became operational in January 1974 and was the biggest airport in the world at the time
- One of the most visited superhub airports in the world, hosting 73 million travelers a year
- Hub to 23 passenger airlines and 23 cargo airlines
- Covers more than 27 square miles and consists of five terminals, 164 gates, and seven runways
- Produces \$37B in annual revenue



Business Drivers and Digital Twin Concepts

➤ Implement a digital twin to provide end-to-end visibility of assets during their entire lifecycle through a **single pane of glass**.

Increases efficiency, performance and availability of the assets.

- Create a digital strategy and governance plan for future DFW construction projects using the digital twin
- Increase efficiency and advance sustainability by creating a digitized infrastructure with Internet of Things (IoT), allowing the assessment and visualization of the operational health of the infrastructure
- Improve communication, awareness, and coordination through immersive visualization with federated access to large amounts of otherwise siloed data
- Improve decision making through analytics and simulations
- Real-time and predictive alerts where various conditions of assets are tracked, and responsible parties are notified before, or as soon as maintenance or emergency situations arise

DFW Airport Project Overview

- Digital Infrastructure Platform (DIP) Solution
- Project value: \$2.59 million (initial)
- Newly rehabilitated Runway 18R/36L and recently expanded Terminal D:
 - Establish a smart campus of DFW airport that is available 24/7, up-to-date and integrated to a variety of engineering technology, information technology, and operation technology systems for planning, construction, operations and maintenance of both facilities and civil infrastructure
 - Optimize cost of airport modernization



DFW's Operational Digital Twin



Provides visibility into all historical and current aspects of DFW assets to better manage and improve operations

Seamlessly builds upon the current asset knowledge base across various asset phases and sources

Provides a single, integrated solution that can be used for all phases of the asset's lifecycle by all DFW stakeholders

Improves management of the airport facilities to increase operational performance, efficiency, and availability of the assets

Runway -
AutoCAD Civil
3D CAD

Terminal -
Revit 3D BIM

Veoci EAM
Part 139
Work Orders

INFOR EAM
Work Orders

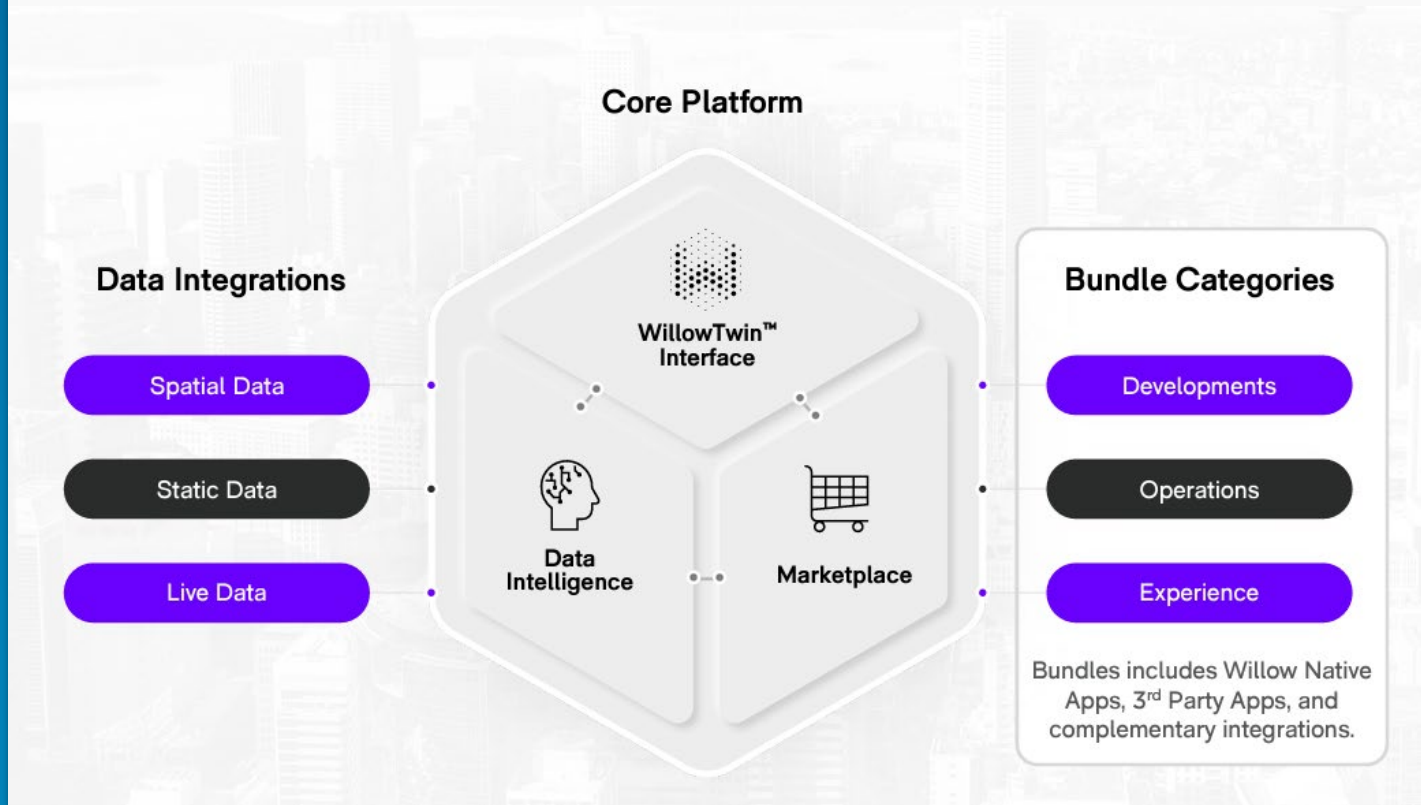
ESRI GIS
Site Content

Lufft ViewMondo
Runway Sensors

Johnson Controls
Building
Management
System (BMS)

Implementation and Integration Overview

- Define Digital Governance Standards
- Provide a cloud-based DT platform
- Link GIS services, CAD & BIM models to the platform
- Develop live integrations with legacy systems
 - Enterprise asset management and maintenance ticketing
 - Building management systems
 - Runway inspection database
 - GIS mapping
 - Sensor data



Example non-specific, non-exhaustive solution summary

Implementation and Integration Process

1. Asset Data

Identify the assets and compare tabular asset data from DFW to the spatial assets identified

Upload relevant assets into the DT

2. Spatial Data

Upload spatial information to the DT and link asset data to the spatial data via graphical user IDs (GUIDs)

Users can see the asset data associated with model elements

3. Pre-Integration

Review airport documentation

Establish an integration strategy

6. Training

Provide training for airport users intended to interact with the platform

5. Data Sharing & Applications

Third party integrations configuration of the Building Dashboard

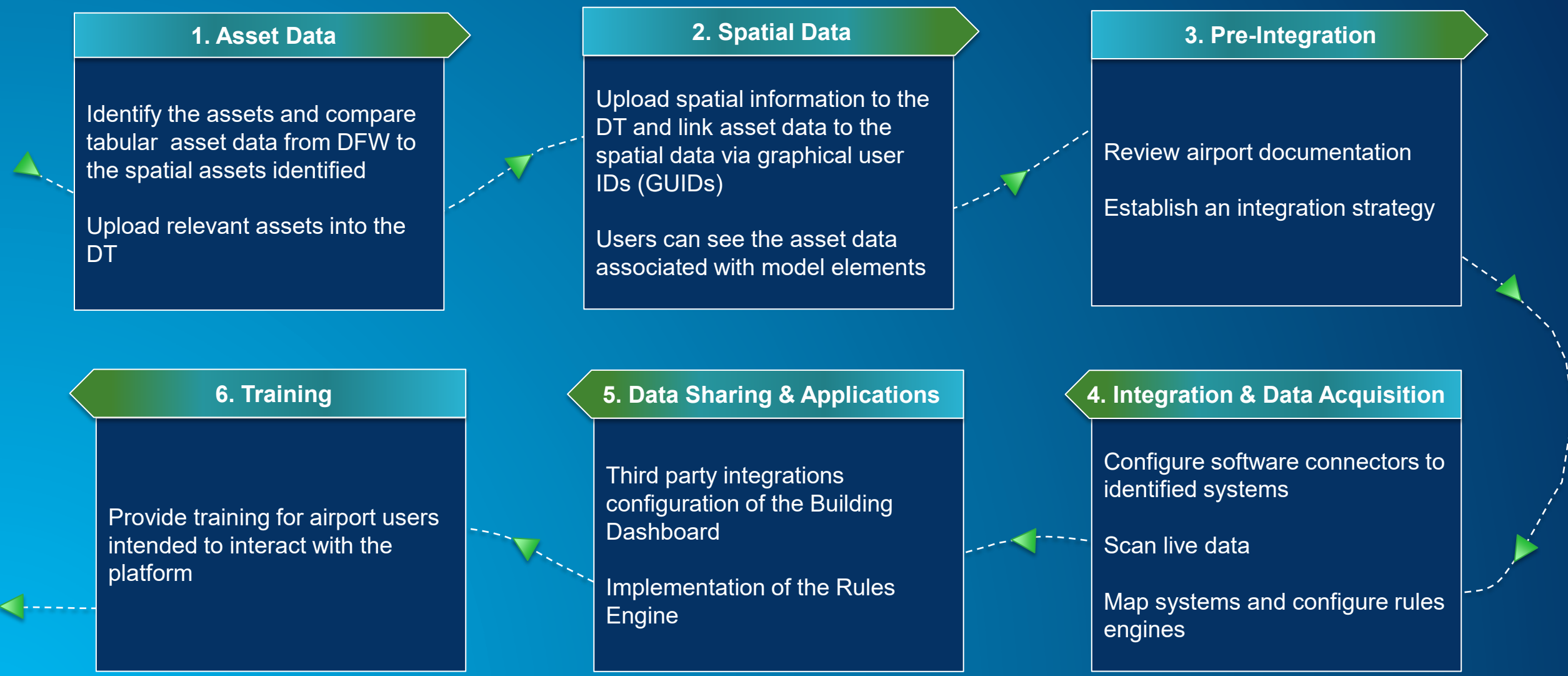
Implementation of the Rules Engine

4. Integration & Data Acquisition

Configure software connectors to identified systems

Scan live data

Map systems and configure rules engines



Implementation Activities

- Review DFW's existing digital strategy and governance documentation
 - Enhance strategy to help DFW use digital data provided by design, construction, and commissioning teams on future capital projects
- BIM Interoperability and Dynamo Model Checking
- Comply with DFW Information Security procedures
- Install platform and configure
- Provide the DFW Team with in-depth training of DT platform and ensure access to the resources required to keep training current and up to date



Platform Roadmap

- Align the user experience with personas and workflows
- Add runways and terminals to platform incrementally over next 5 years
- Integrate with the Central Utility Plant (CUP)
- Implement bidirectional integration to work order systems
- Develop enhanced data analysis and strategic reporting



Thank you!

Questions?



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