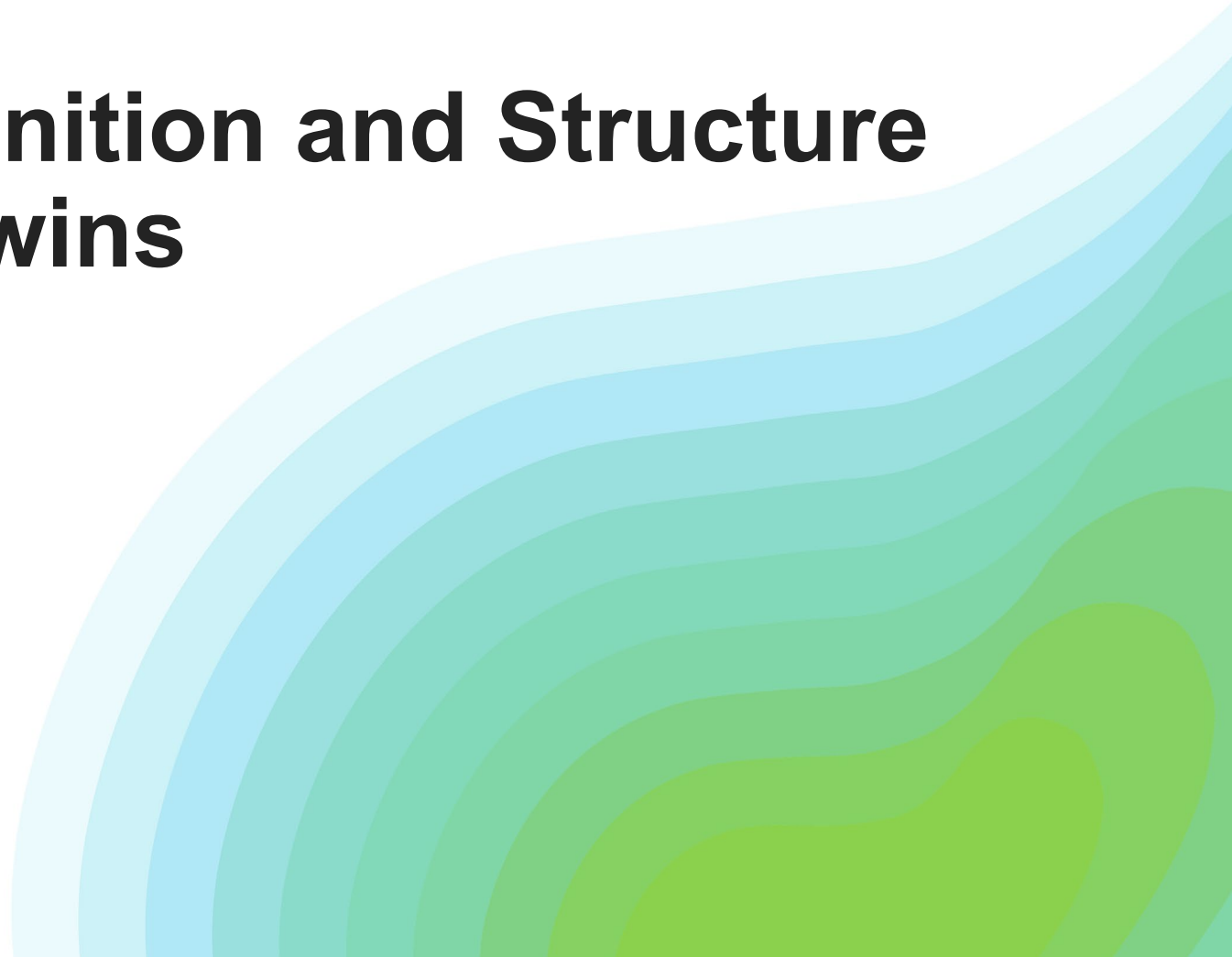


# Optimizing Asset Definition and Structure for Enabling Digital Twins

December 10, 2024

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20+ Years Experience in Asset Management

Data Chair, Airports Working Group, BuildingSMART USA



# Key Concepts



Digital Twins Rely on Interoperable Data

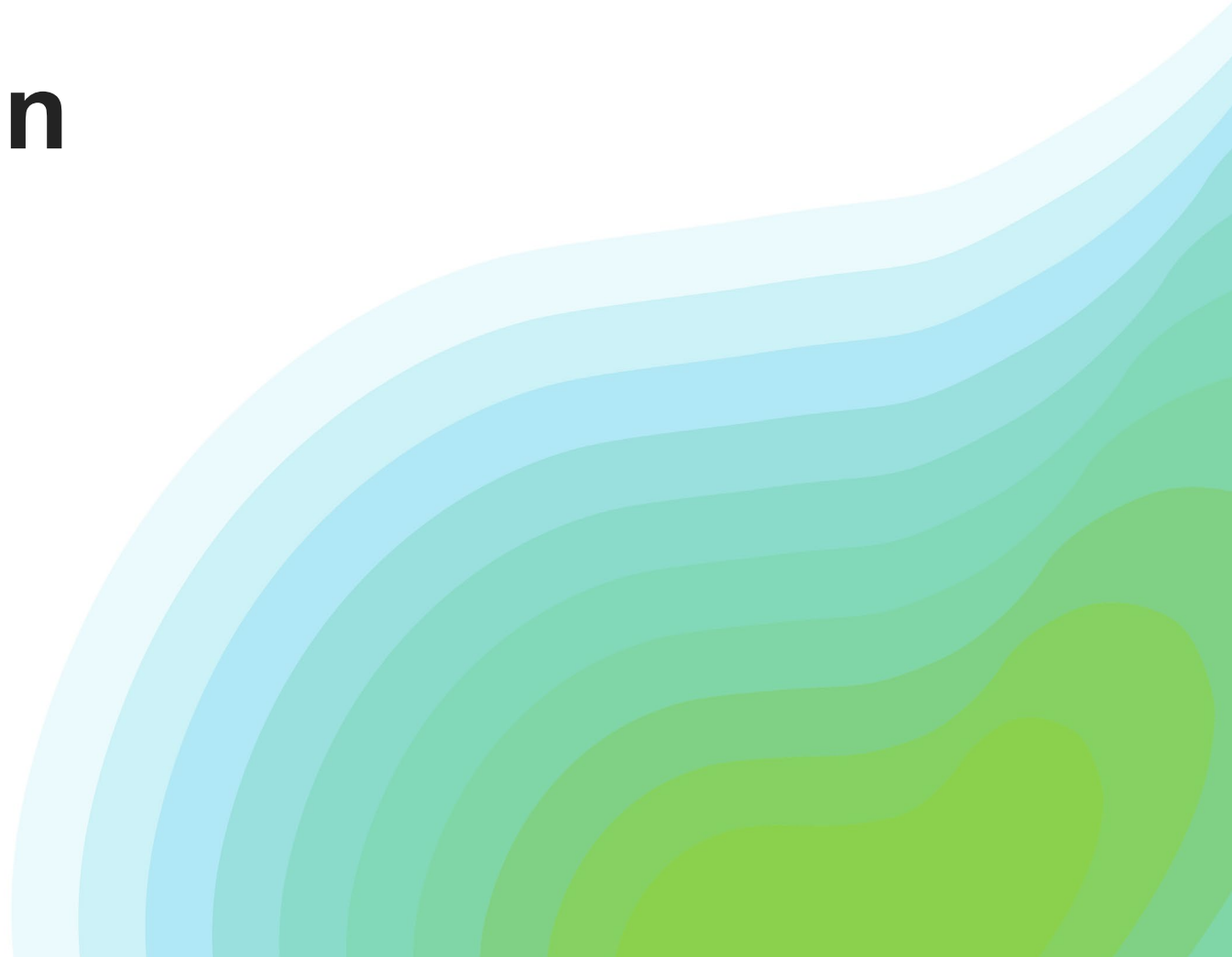


Data Interoperability is a Challenge for Asset Definitions and Structures



Asset Registries, Finding the “LCC”, and Open Standards are Methods for Improving Interoperability

# Digital Twins Rely on Interoperable Data

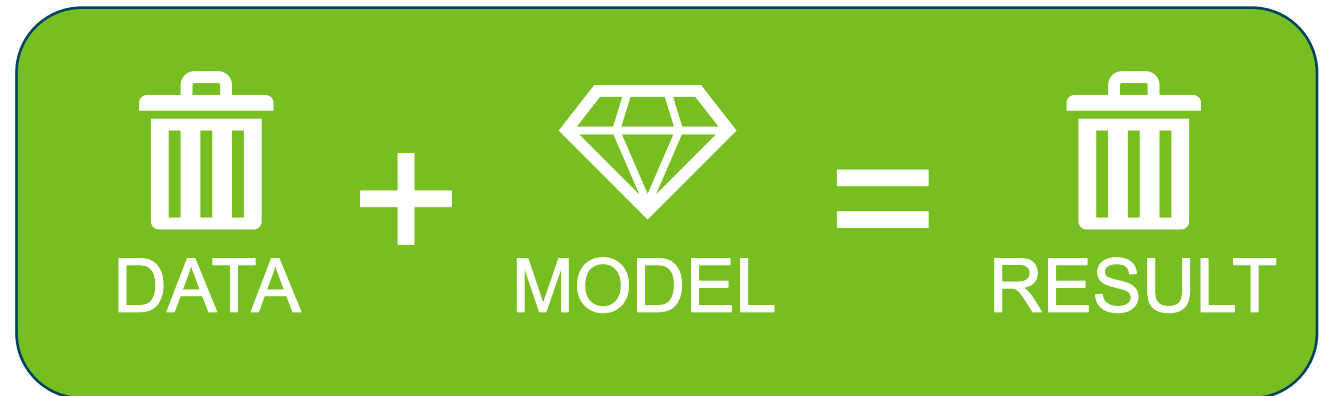


# Data is Destiny

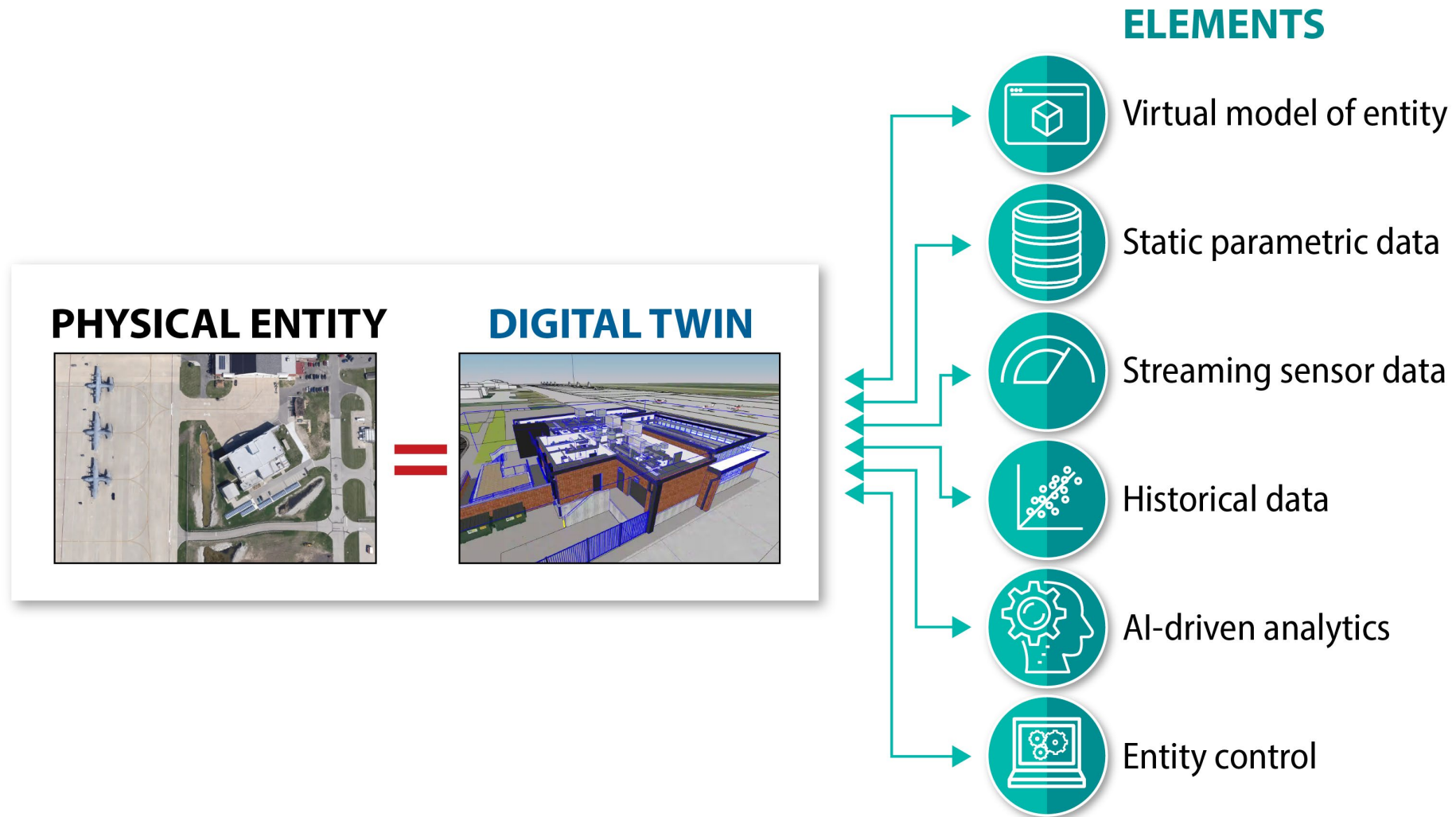
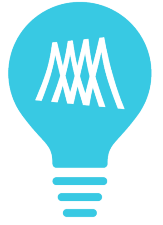
Technology has changed the speed and scale of data-driven decisions.

AI/ML models are entirely dependent on the data upon which they are trained.

Good data matters more than ever!



# Digital Twin: Exercise in Integration



# Semantic Integration vs. Technical Integration

A circular icon containing the binary code '1010' repeated twice, representing technical integration.

1010  
1010

**Technical Integration** is how data is physically exchanged.



**Semantic Integration** is how data is understood and interpreted.



AI is more dependent on **semantic integration** than technical integration.

# Data Interoperability Enables the 4 A's of Data Quality



Abundant



Accurate



Accessible



ASAP!

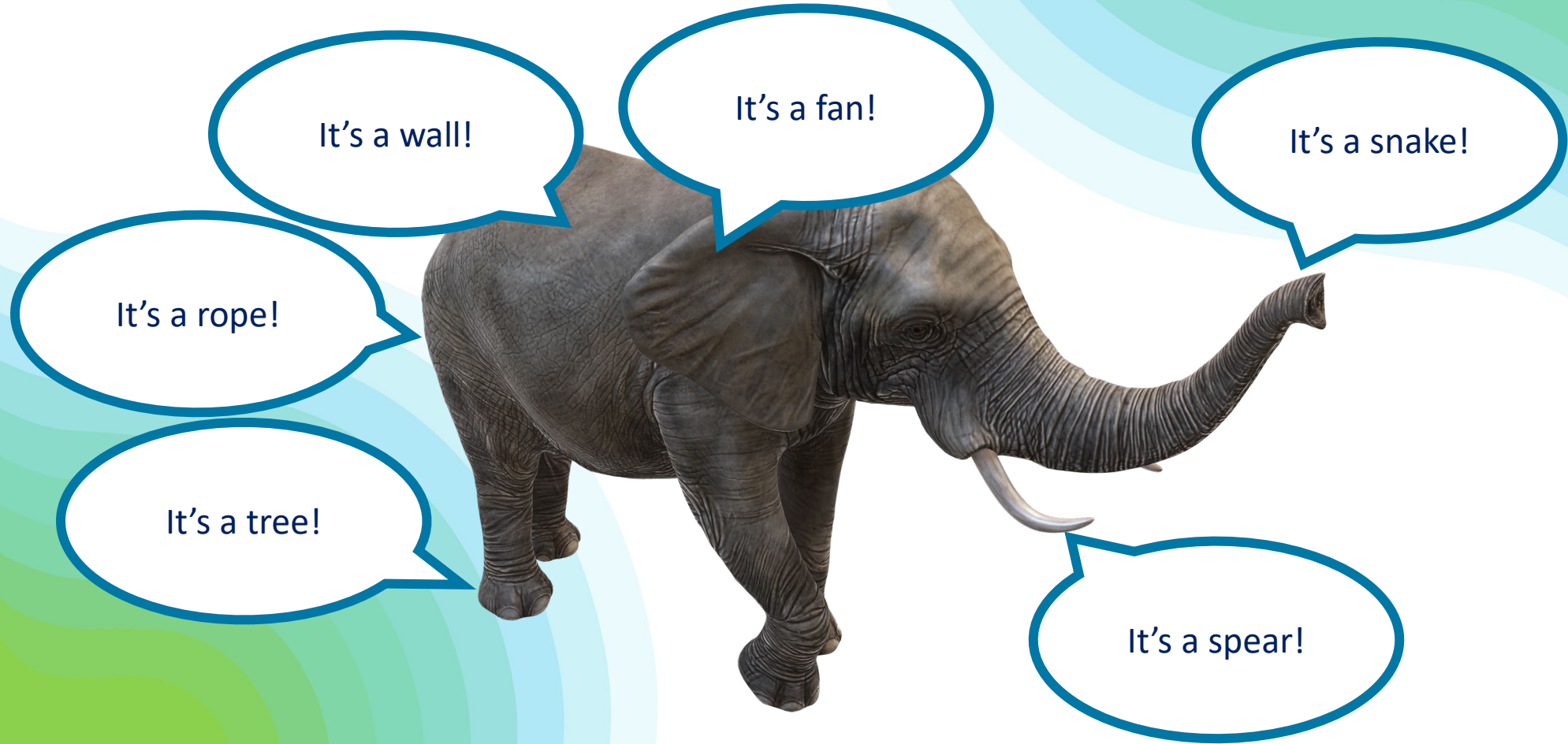
And leads to faster, more confident decisions that increase efficiency and reduce risk, leading to reduction in costs.



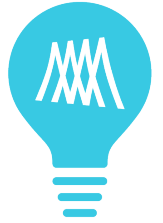
# Data Interoperability is a Challenge for Asset Definitions and Structures




# The Six Blind Men and the Elephant (A Parable)



# Definition of an Asset

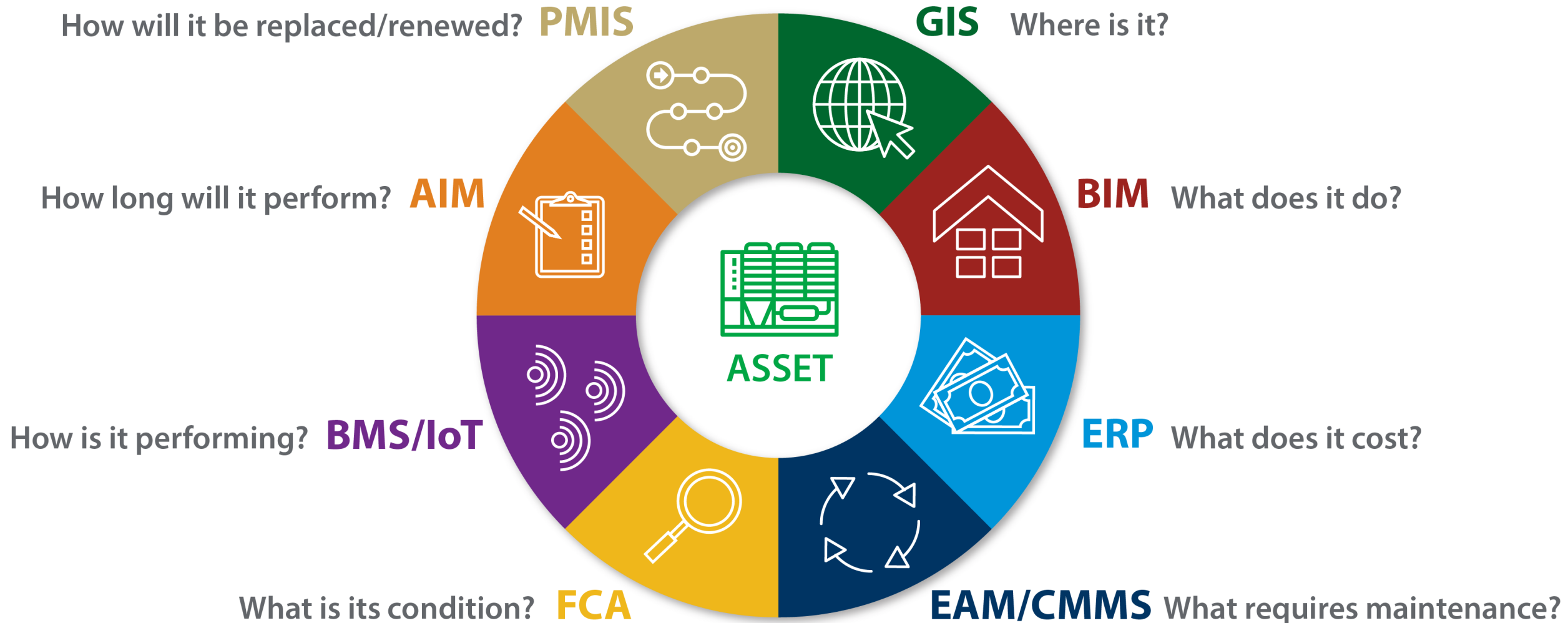
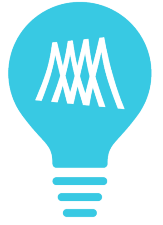


 **ISO 55000** An item, thing, or entity that has potential or actual value to an organization.

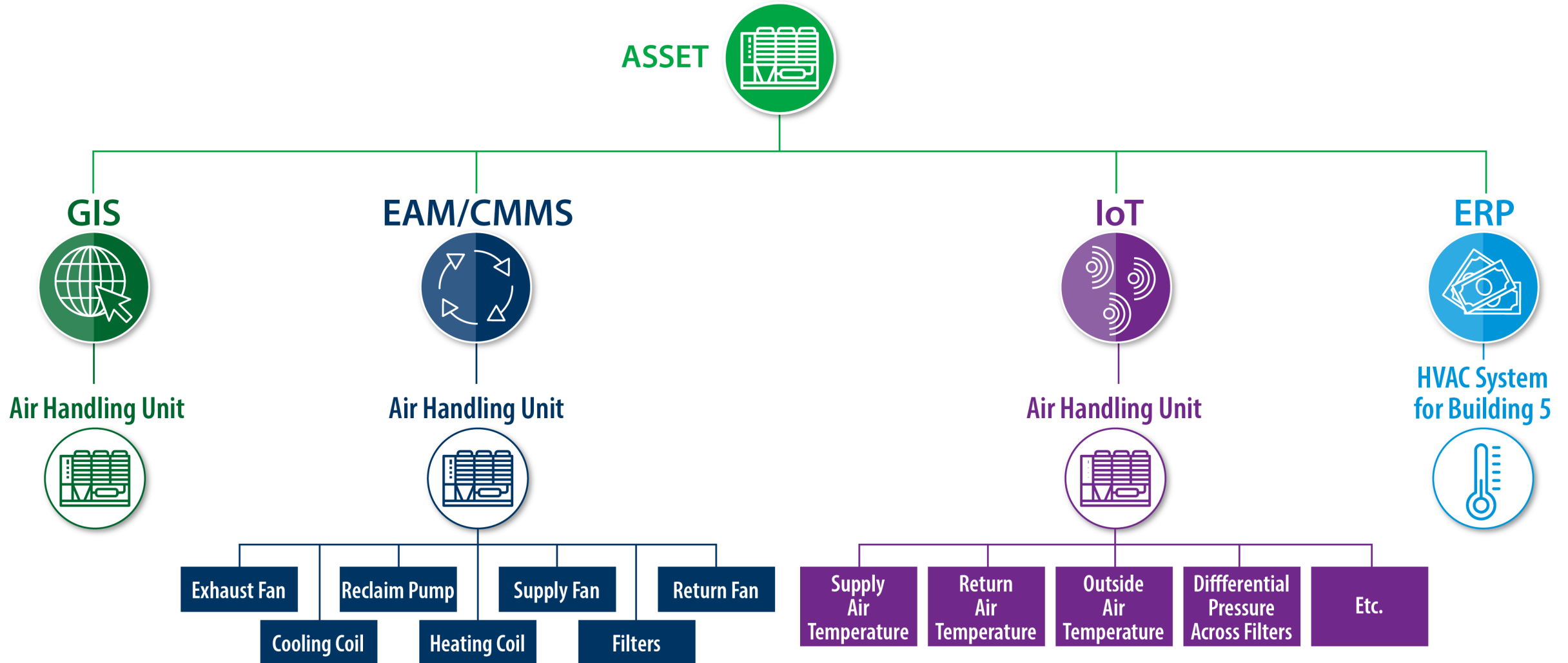
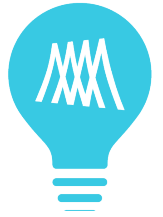
REQUIRES A  
PERSPECTIVE

UNIQUE TO  
ORGANIZATIONAL  
CONTEXT

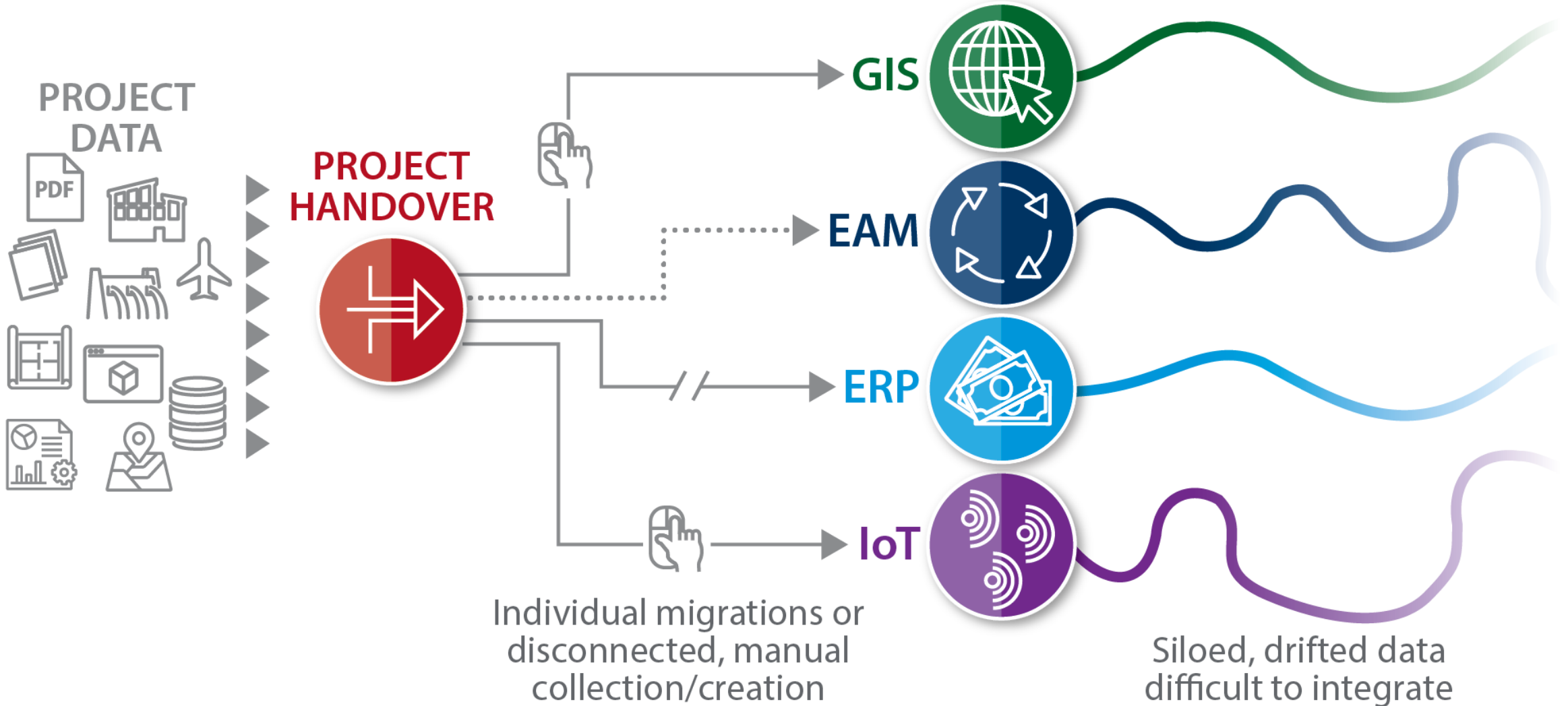
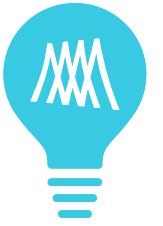
# Asset Definition – Information Systems View



# Asset Definition – Information Systems View



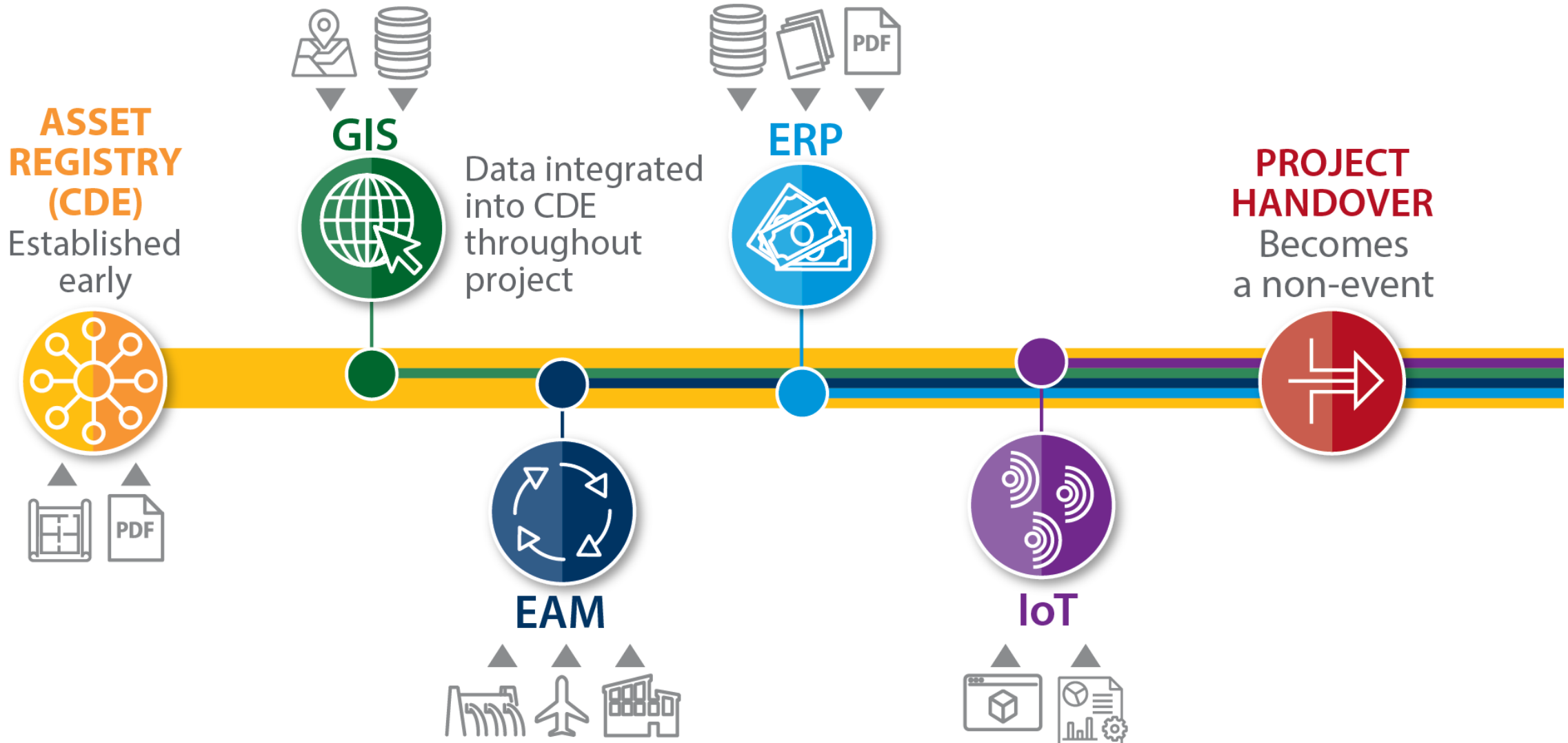
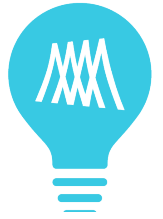
# No Linkage – The Frayed Thread



# Improving the Interoperability of Asset Definitions and Data Structures



# Asset Registry Binds the Golden Thread



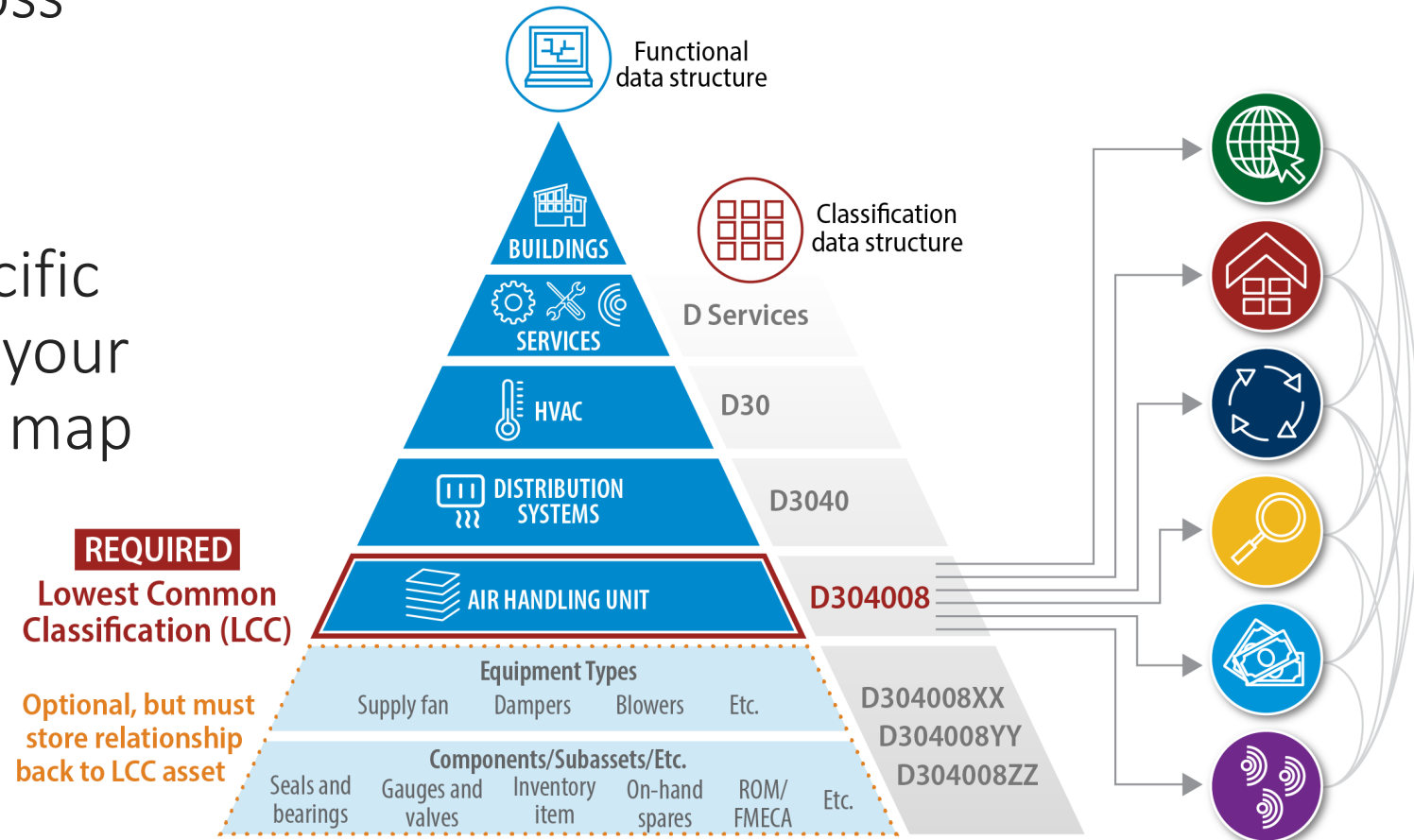


# Finding the Missing Link

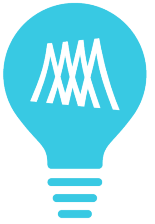


**Objective:** Simplify semantic integration of Asset Types across systems.

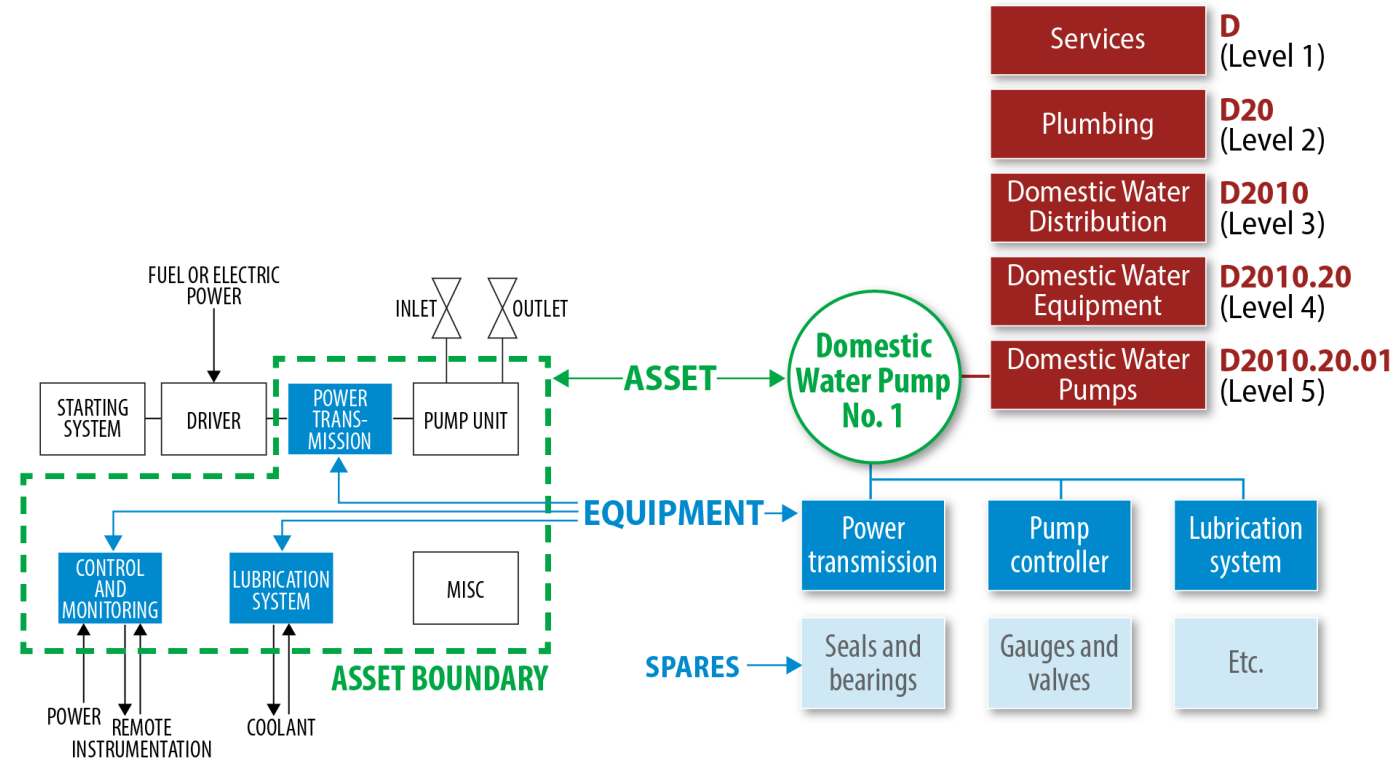
**Method:** Identify a shared specific list of asset types that each of your asset information systems can map to.



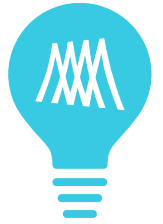
# Tips for Finding the LCC









1. Utilize an industry standard classification structure as backbone.
2. Define “System” vs. “Asset” vs. “Equipment”
3. “Assets” can provide a value-added service on their own.
4. Work top-down through your chosen classification hierarchy for each type of asset you manage.



# Putting it Together: The Asset Registry



## AIR HANDLING UNIT: AHU 5.1.1

	<b>GIS</b> Geographic information system	<b>In GIS:</b> Yes	<b>ID:</b> AHU 5.1.1	<b>Location:</b> 27.916076, -82.502253		
	<b>BIM</b> Building information modeling	<b>In BIM:</b> Yes	<b>ID:</b> AHU.1.1	<b>Model:</b> BLDG5_MEP	<b>System:</b> HVAC	<b>Room:</b> MECH 201
	<b>EAM</b> Enterprise asset management	<b>In EAM:</b> Yes	<b>ID:</b> AHU5.1.1	<b>Parent:</b> 05-019-01	<b>Children:</b> EF01, PU01, SF01, RF01, CC01, HC01	
	<b>FCA</b> Facility condition assessment	<b>In FCA:</b> No	<b>ID:</b> N/A	<b>FCA Parent:</b> BLDG5.D3050		
	<b>ERP</b> Enterprise resource planning	<b>In ERP:</b> No	<b>ID:</b> N/A	<b>ERP Parent:</b> P.2003-0568		
	<b>BMS</b> Building management system	<b>In BMS:</b> Yes	<b>ID:</b> AH 501			

Allows for different system-based schemas.

Provides the data interoperability “decoder ring.”

Stores anything considered to be an asset.

Does not own asset data, only stores relationship to records in enterprise systems.

# Open Standards

Publicly available specifications that provide a common framework for designing and implementing interoperable systems.

Transparent

Collaborative

Consensus-driven

Freely Adopted

Freely Implemented

Freely Extended

# Benefits of Open Standards



Interoperability



Innovation



Reduced Vendor  
Lock-In



Collaboration

# Example of Open Standards for Asset Data



... regardless of software!

# Final Thoughts

**Digital Twins thrive on INTEROPERABLE DATA!**

**Most Owners' data is NOT INTEROPERABLE!**

**Asset registries, LCC's, and open standards improve INTEROPERABILITY!**

# Thank You!

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