Digital Twin Consortium
an EDM Association Community

Digital Twin Consortium Overview: From Testbeds to Class Rooms

Dan Isaacs: CTO & GM

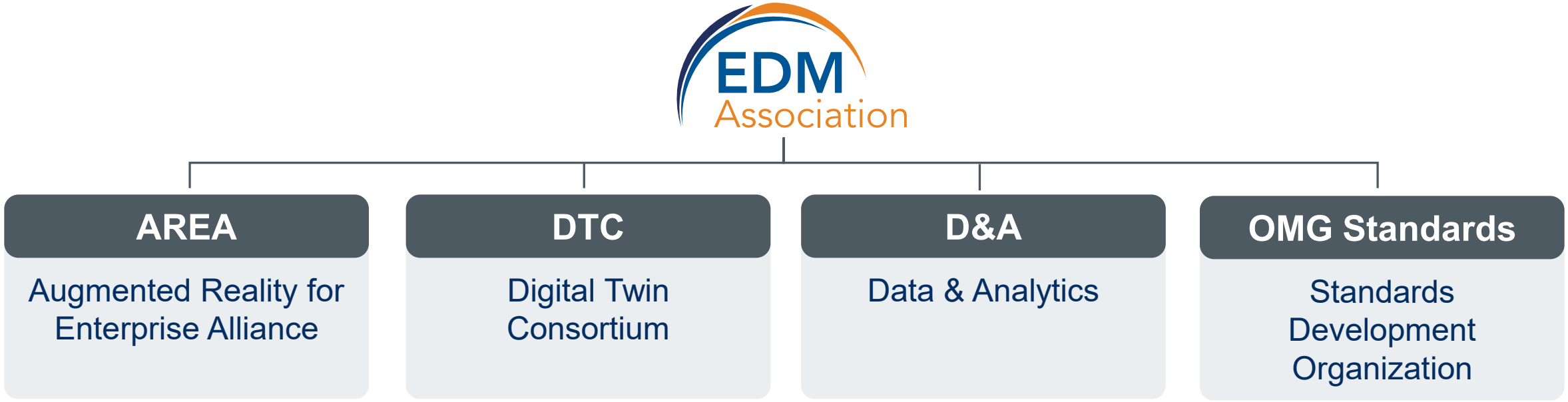
October 2026

edmcouncil.org

digitaltwinconsortium.org

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EDMA Community of Consortia



The EDM Association is a combination of 4 consortia

- Each consortium is joined separately with associated membership levels and benefits
- Each consortium membership includes qualified access to tools and resources across all EDM Association consortia

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EDM Association Value & ROI Highlights

	EDM Association			
	Data & Analytics	digital twin CONSORTIUM	AREA	OMG Standards Development Organization
Community Forums, Consortia & Networking	• AI, Data Products • Regulatory • Risk • Regions	• Digital Engineering • Virtual Product Development • Systems Optimization • Regions	• AI Joint Working Group • Human Factors • Safety • Regions	• Platform • Domain • DDS, CISQ • Regions
Innovation Solutions & Test Beds	• Data Products • Data Excellence Program • Data Asset Foundations	• Test Beds • Platform Stack Framework • Technology Showcase	• AR Ecosystem Framework • AR Security Frameworks • AR Safety Frameworks	• OMG Standards • ISO Fast Track • Technical Meetings
Best Practices Frameworks, Standards & Industry Initiatives	• DCAM • CDMC • FIBO	• AI Agent Periodic Table • Digital Twin Periodic Table • Glossary of Digital Twins	• Augmented Reality Glossary • Requirements Tool • Best Practice Safety Playbook	• SysML2 • BPMN2 • UML2
Resources Training, Tools, Research & SMEs	• SMEs • Training & Certifications • White Papers • Marketing Opportunities	• SMEs • Test Bed Use Cases • White Papers • Marketing Opportunities	• SMEs • Global Research • Use Cases • Marketing Opportunities	• SMEs • Certifications • Partner Program • Marketing Opportunities

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Digital Twin Consortium – DTC

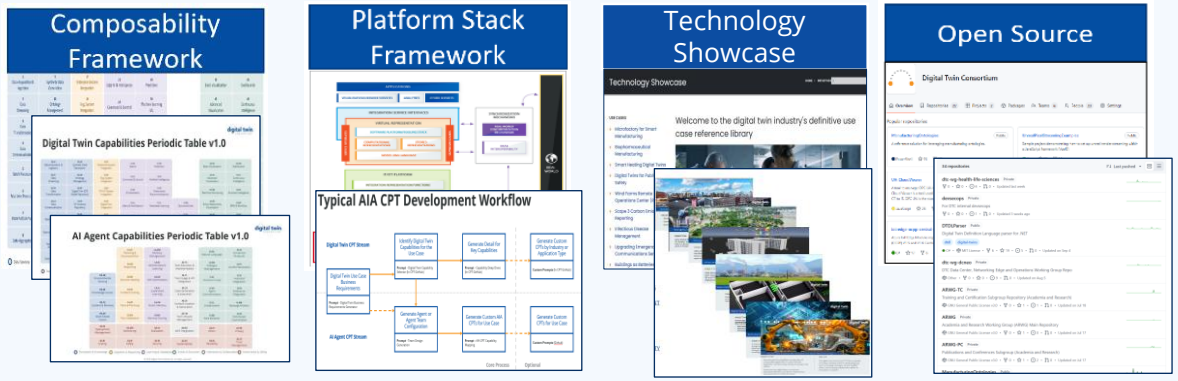
digital twin® CONSORTIUM

The Digital Twin Consortium helps organizations move from concepts and frameworks to practice.

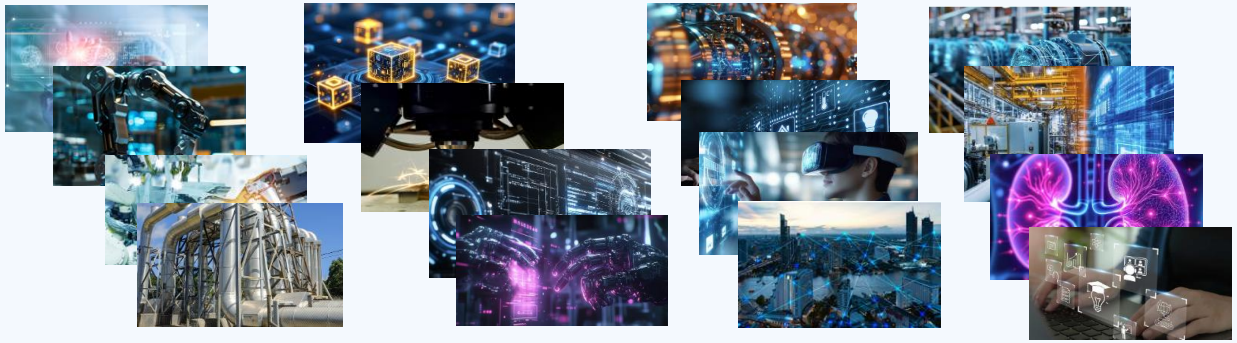
Through real-world applications, we enable teams to collaborate and develop advanced digital twins from data-driven virtualizations of real-world entities and processes, to accelerate innovation and improve outcomes.

Our consortium members learn from each other's successes and collaborations, where best practices emerge from proven results, and the true value of digital twins and enabling technology is realized.

Consortium Initiatives



Application focused Testbeds



[Testbed Portfolio Page]

EDM Association

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150+ Members – and Growing

Researchers | Technology Providers | Academia | Government | Digital Twin Users

Steering Committee Members

XL Industry Members

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1

2020

Original Five Working Groups



2

2022

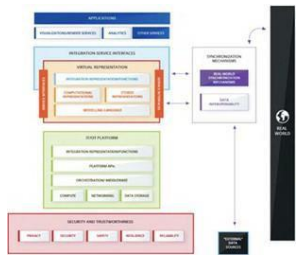
Capabilities Periodic Table v1.0



3

2023

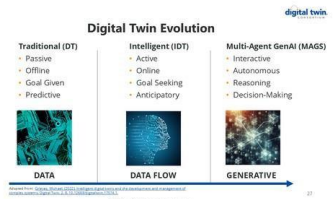
Platform Stack Architectural Framework



4

2024

Digital Twin Evolution Multi-Agent Gen AI



5

2025

Testbeds Portfolio Announced



6

Present*

AI Agent Capabilities Framework & Toolkit v1.0



* -12 Working Groups

-12 Technology Showcases

-21 Testbeds

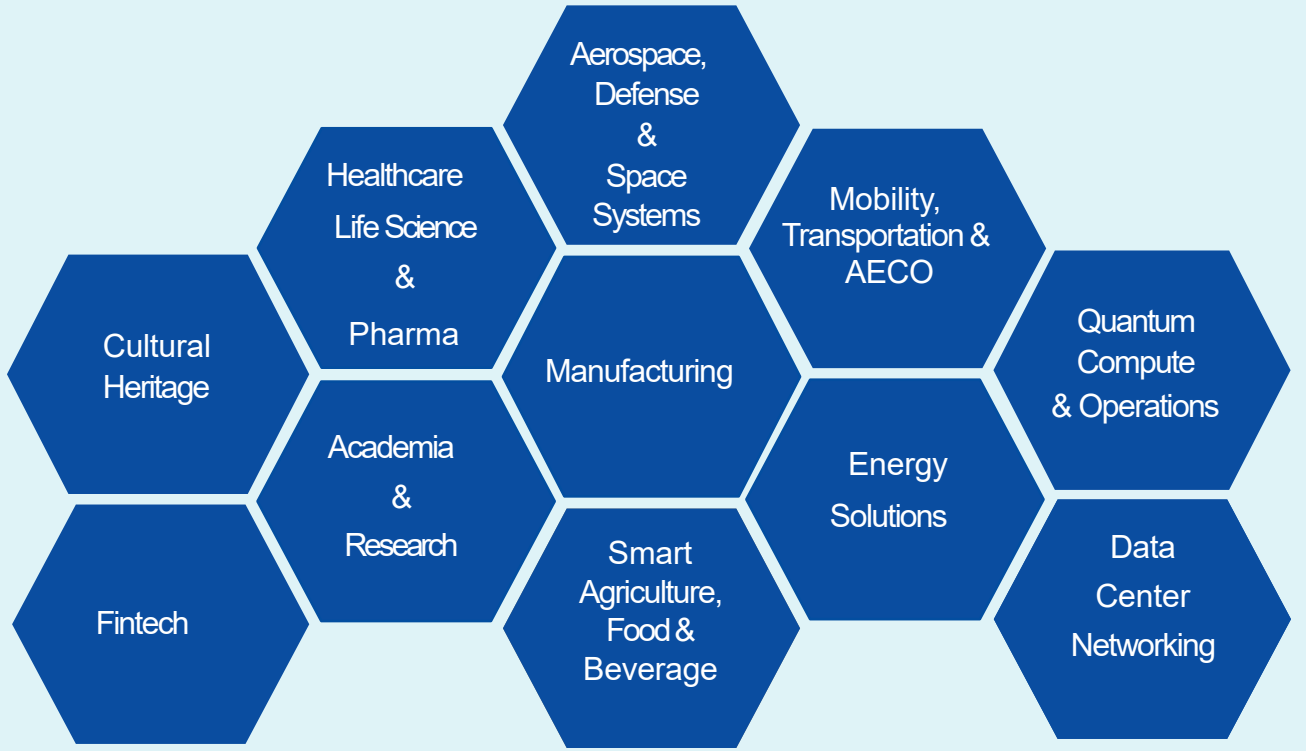
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DTC Working Groups and Focus Areas

Horizontal WG and Focus Areas



Industry Vertical WG

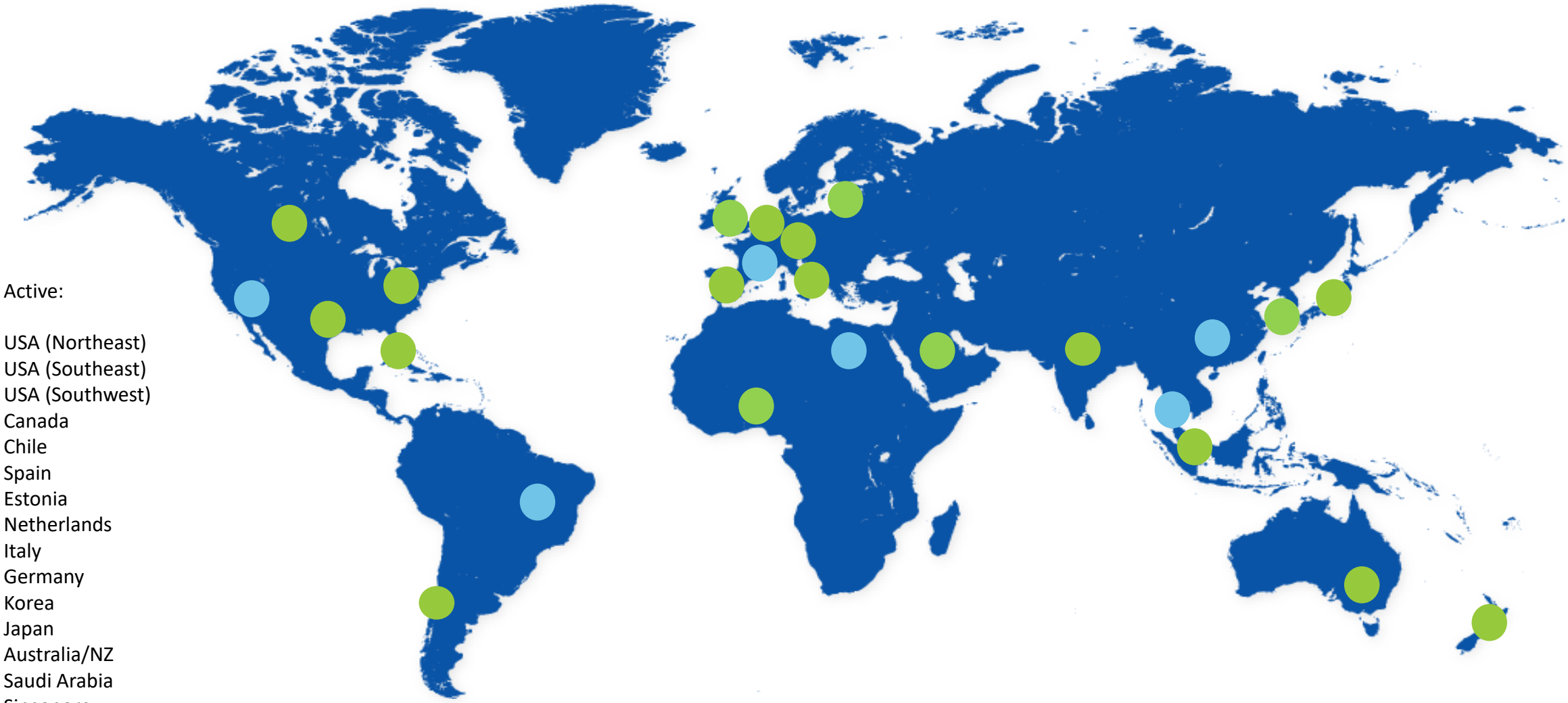


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Regional Branch Coverage

Active:

USA (Northeast)
USA (Southeast)
USA (Southwest)
Canada
Chile
Spain
Estonia
Netherlands
Italy
Germany
Korea
Japan
Australia/NZ
Saudi Arabia
Singapore
India
United Kingdom
Ghana



8
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Liaisons - Global Collaboration

digital twin CONSORTIUM

American Institute of Aeronautics & Astronautics

AIoT User Group

Augmented Reality for Enterprise Alliance

Association for Smarter Homes & Buildings

American Society for Photogrammetry and Remote Sensing

Autonomy Institute

buildingSMART International

The Smart Manufacturing Institute

Centre for Spatial Data AECOs and Land Administration

CEO Leadership Alliance Orange County

The FIWARE Foundation

Global Mining Guidelines Group

International Council on Systems Engineering

Industrial Digital Twin Association

Interoperability Institute

InnovateEnergy

ISO/IEC JTC 1/SC 41

Manufacturing x Digital

National Institute of Building Sciences BIM Council

Open Applications Group

Open Health Systems Laboratory

Open Industry 4.0 Alliance

OPC Foundation

Post-Industrial Institute

Smart Cities Council

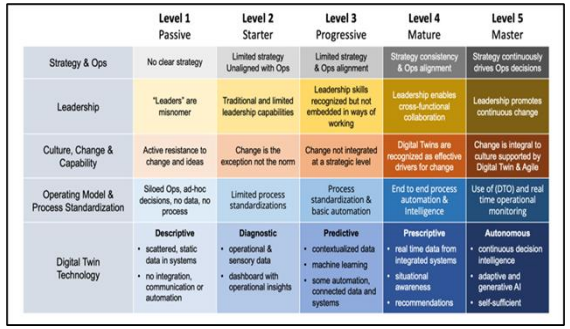
Spatial Web Foundation

Texas State CIEDAR Consortium

EDM Association

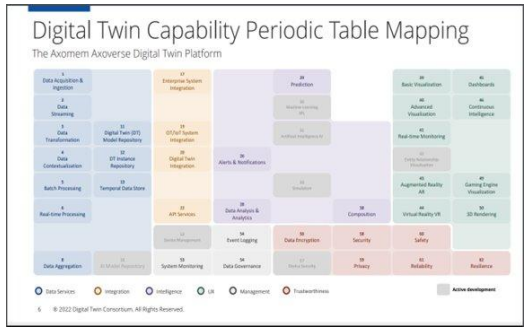
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From Work Product to Use Case Workflow

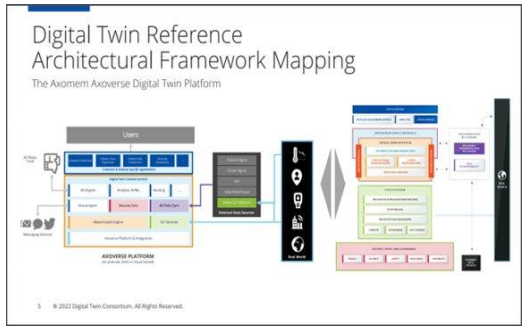


	Level 1 Passive	Level 2 Starter	Level 3 Progressive	Level 4 Mature	Level 5 Master
Strategy & Ops	No clear strategy	Limited strategy Unaligned with Ops	Limited strategy & Ops alignment	Strategy consistency & Ops alignment	Strategy continuously drives Ops decisions
Leadership	"Leaders" are misnomer	Traditional and limited leadership capabilities	Leadership skills recognized but not embedded in ways of working	Leadership enables cross-functional collaboration	Leadership promotes continuous change
Culture, Change & Capability	Active resistance to change and ideas	Change is the exception not the norm	Change not integrated at a strategic level	Digital Twins are recognized as effective drivers for change	Change is integral to culture supported by Digital Twin & Agile
Operating Model & Process Standardization	Siloed Ops, ad-hoc decisions, no data, no process	Limited process standardizations	Process standardization & basic automation	End to end process automation & Intelligence	Use of (DTO) and real time operational monitoring
Digital Twin Technology	**Descriptive** • scattered, static data in systems • no integration, communication or automation	**Diagnostic** • operational & sensory data • dashboard with operational insights	**Predictive** • contextualized data • machine learning • some automation, connected data and systems	**Prescriptive** • real time data from integrated systems • situational awareness • recommendations	**Autonomous** • continuous decision intelligence • adaptive and generative AI • self-sufficient

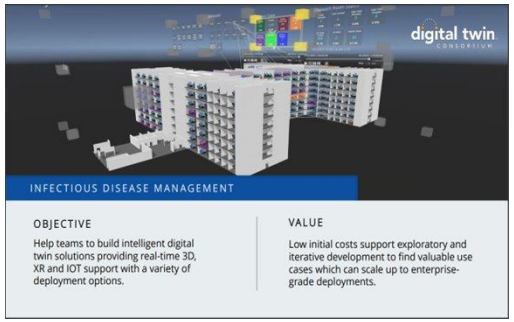
Digital Twin Maturity Assessment



Identification of Capabilities



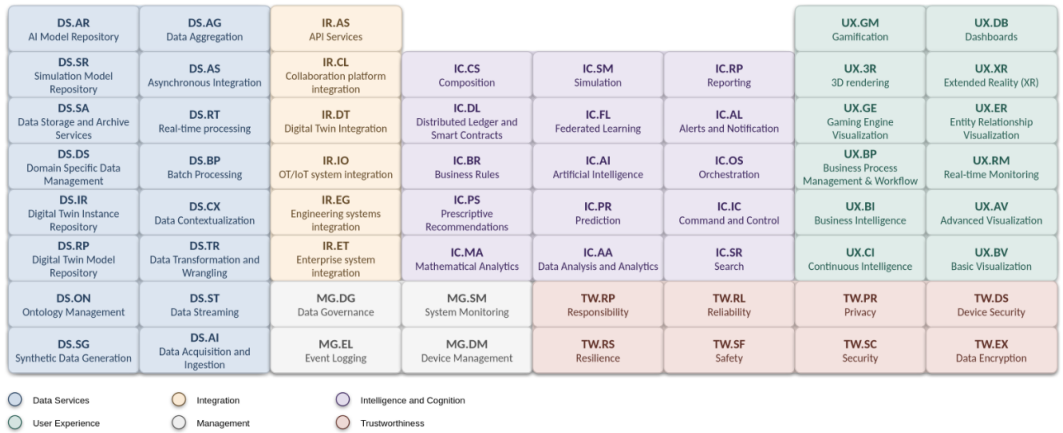
Mapping to Platform Stack Framework

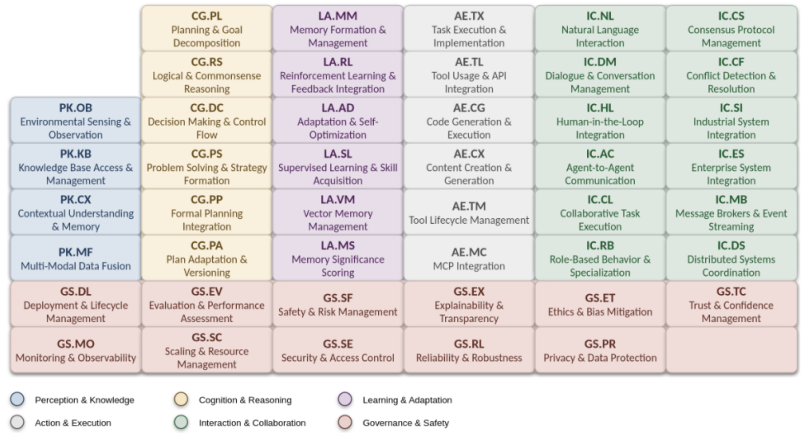


Digital Twin Implementation

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One system, two capability tables





Digital Twin CPT

What must the twin provide?

AI Agent CPT

What must the agent do?

Shared business requirements → both capability streams → joined design → technology choices.

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digital twin CONSORTIUM

RowanUniversity
DIGITAL ENGINEERING HUB (DEHub)

The Digital Twin is More Than What You See

What you experience is just the tip. The value is built on what's beneath the surface.

What You See and Experience

Human, agent, and robot interactions with evidence and confidence.

ACTUATION

What acts on the world

- **Humans** (dashboards, workflows, work orders, XR surfaces)
- **Autonomous agents** (software agents)
- **Robots and physical AI** (mobile robots, cobots, AVs, edge devices)
- **Connected systems** (control loops, work-order systems, ERP)

THE VISIBLE TIP

Dashboards. Alerts. Workflows. Recommendations. Actions. This is **how digital twin applications are experienced.**

The Digital Thread

The connective fabric that binds every layer together.

- Bidirectional
- Ontology-carrying
- Lifecycle-spanning
- Secure and governed

DECISION AND PROCESS ORCHESTRATION

What to do and how to decide

- Intelligence & Cognition
- Reasoning & Inference
- Learning & Adaptation
- Simulation Decision Gate
- Confidence & Authority Tiering

THE DECISION ENGINE

Decisions are reasoned, simulated, and validated here—before any action touches the real world.

CONTEXT

What the data means and how it relates

- Ontology & Semantics
- Operational Identity (AAS-aligned)
- Perception & Knowledge
- Lifecycle, Provenance, Lineage
- Pragmatics and Intent

THE MEANING LAYER

Context gives data meaning. Identity, lineage, and intent live here. The Digital Thread does its work here.

DATA

Where operational data lives

- Data Services
- Integration
- Federated access: historians, SCADA, MES, ERP, work orders, data lakes, edge stores
- Reality capture point clouds, photogrammetry, LiDAR, drone and ground imagery

First-class for asset-intensive industries

- Customer-owned platforms remain authoritative

THE FOUNDATION

Operational data from many sources. Synchronized with reality at the right frequency and fidelity.

A Digital Twin System connects it all. | One architecture. Four layers. Infinite value.

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RESOURCES

- Testbed Portfolio
- Submit Testbed Interest Form



Developing the Next Generation of Systems and Enabling Technologies Using Digital Twin Testbeds

The Digital Twin Testbeds are a member-driven program designed to advance digital twin systems and enabling technologies. The initiative provides a collaborative, holistic approach DTC members can use to develop, test, verify, validate and implement digital twin systems and advance digital twin-enabling technologies.

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The Digital Twin Testbed Ecosystem: Portfolio of Innovation



COGNOS-X
XMPro



NEGOTIATE
NEC



MANDATE-R2R
KIMM



Q-Pod
BQP



SAFESME
HS Soft



Beyond Automation
Dassault Systèmes



Digital Manufacturing for Flaw-free Metals
Rowan University



TWINSENSE
Aingura IIoT



COMPOSE
NTT



Geothermal Digital Twin Deployment No-Code Platform
Decimetrix



Nexus
Crysp



Q-SMART
WINNIO



TRANFORM
EDX Technologies



FAB
DRG Tech Solutions



STELLAR
Stellar Transformer Technologies



Giants of Oak Ridge
Oak Ridge High School



AEGIS
Performance Learning



ENGAGE
Austin Community College



Axomem Axelle Gen AI Extension for Healthcare
AXOMEM



SYNTHEKID
Health Innovation Yorkshire & Humber



CAMPUS-SAFE
George Mason University

Innovation Centers & Living Labs - Global footprint



12 active sites · 2 potential

DEHUB's VISION: Create Digital Engineering Ecosystems

RowanUniversity
DIGITAL ENGINEERING HUB (DEHub)

"...we are creating a venue where industry, the government, and academia can collectively solve problems and define the next-generation of applications related to the Digital Transformation..."



Digital Engineering Ecosystem

- **Digital Twins**
  - **Real-time monitoring**
  - **Data models**
  - Simulations
  - **AI&ML**
  - **XR**
  - Diagnostics & Prognostics
- **Cyberphysical Systems**
  - Design and development
  - Process Modeling
  - Digital testing
  - Automated Discovery
  - System Integration
  - **Packaging, Scaling, Security**

engineering.rowan.edu/dehub/what-we-do/

Innovation Centers & Living Labs - Global footprint

Focus Areas by Geography



Oak Ridge

Nuclear · Grid



Baton Rouge

Energy/Manufacturing



Rowan Univ.

Manufacturing



Ireland

A&D: Digital Catapult



Steinbeis

IoT/Edge, Training



Italy

Manufacturing



Middle East

Smart City



IIT Kharagpur

IOT/Edge



Korea

Smart Mfg



Japan

IoT/Edge / Healthcare



Chile

Mining



Peru

Mining/Agri



Colombia

Energy · Agri



Nexus

Sustainability/FM

From EU Innovation Center to Everyday work – Concept to Deployed Applications

Ideas proven in EU research become tools for companies, careers and health.

R&D

9 EU research projects under way

Proven in the lab before it reaches a client

- 6G
- Digital twin
- Zero trust security
- Regulatory sandbox
- Testbed as a Service

Digital Twin Consortium
Regional Branch & Liaison Global Network



B2B AI DIGITAL TRANSFORMATION

Sector problems, ready-made answers

Ports and shipping	**Maritime AI**
Care at home	**Human digital twin and assisted living**
Law firms	**AI Legal Mixer, cloud or local**

WORKFORCE DEVELOPMENT

Skills that keep careers moving

AI training
Hands-on team courses on AI and digitalization

AI Prompt Mixer
Get better and more efficient answers

AI Job Mixer
Guides jobseekers from search to job offer

PHILANTHROPIC

Health knowledge for everyone

AI Medical Mixer
Plain-language health answers and prescription scans in 25+ languages. Free to start, 11,000+ people helped.

From The Secret City to The Innovation City

Building A Learning Innovation Ecosystem

Dr. Mark Buckner

Founder, iSchool & Wildcat Manufacturing | Oak Ridge High School

2024 Award for Excellence in Education from the Tennessee School Boards Association (TSBA)

Paul Harris Fellow | 2023 FIRST Woodie Flowers Award

Rotary Club of Oak Ridge | February 19, 2026

iSchool
A Learning Innovation Ecosystem
... empowering the InnovatORS of tomorrow, today!

Oak Ridge SCHOOLS

WILDCAT MANUFACTURING

40+ Partners Engaged

We are better together!
Space Time
Partner ships
Modes of Learning

iSchool Learn Wildcat Manufacturing

AMSE American Museum of Science & Energy

iSchool Learn Design and Manufacturing Center

Oak Ridge Schools

Roane State Community College

The University of Tennessee Knoxville

ACE America's Cutting Edge

Nate Bailey llc

MSC Built to Make You Better

Kennametal

Haas

Boys & Girls Club of Oak Ridge

Peraton Remotec

UT-Battelle Oak Ridge National Laboratory

Y-12

Lincoln Electric

amazon robotics

girls inc. Inspiring all girls to be strong, smart, and bold℠

UTV

Lokar Performance Products

scrum inc.

Titans of CNC Academy

electro-active technologies

ORAU

Oak Ridge Enhanced Technology & Training Center

TTE Tennessee Tool & Engineering

Autodesk/Fusion360
SolidWorks

Kairos Power

ingenuity

ORT-E Oak Ridge Tool-Engineering, Inc.

Navus

KANSAS CITY NSC National Security Campus

Markforged

Learning Library

WARDJet Waterjet University Curriculum

Composites iacmi Institute

The W. Edwards Deming Institute

partnerships: national labs, industry, academia & community · ORNL · UTK · RSCC · Haas · Scrum Inc. · Deming Institute · Y-12 & more

Digital Twin Consortium Testb

digital twin Consortium

Testbed: Digital Engineering For The Next Generation

Creating "Born Qualified" Assets Through AI, AR/VR, and Hybrid Manufacturing

Digital Twin → Convergent MFG → Traceable Skills

- Digital Engineering: Born Qualified
- Resilient Agile Micro-Manufacturing
- Accelerated Learning (AI + AR/XR)

Partners: XMPro, Ingenuity, Crysp, Sev1Tech, Dassault, Y-12/ORETTC, ORNL, SLB, ORAU ...

Enhancing Learning Environments & Educational Resources



ORS in partnership with ORPSEF is proposing a new Innovation Center at the ORHS campus to ensure our schools remain cutting edge and students are competitive in securing high-wage and high-demand jobs. Traditional Career & Technical Education programs must evolve with industry, new technologies and for the jobs of the future.

Oak Ridge Public Schools Education Foundation
Enhancing public school education

ATTENDEE WORKBOOK

Developing Digital Twins with Generative AI

A simplified workshop workbook for applying the Digital Twin Capability Periodic Table and, where appropriate, the AI Agent Capability Periodic Table.

Digital twin definition: A digital twin is an integrated data-driven virtual representation of real-world entities and processes, with synchronized interaction at a specified frequency and fidelity.

Digital Twins are motivated by outcomes, driven by use cases, powered by integration, built on data, enhanced by physics, guided by domain knowledge, and implemented in dependable and trustworthy IT/OT/ET systems.

How to use this workbook: choose one problem statement, gather enough context, then run the prompts in sequence. The prompts here are attendee-safe and simplified for practice. The full DTC workshop materials include deeper prompts, facilitator guidance, Digital Twin System positioning material, Operational AI Manifesto material, and artefact-generation instructions.

DTC Training Architecture

DIGITAL TWIN CONSORTIUM
18 September 2026

Three swappable modalities · 30 stackable modules · learning paths across, deeper dives down · graded to DTC accreditation

MODALITY 1
Introductory Showcase
One day, at a lab · The DCAM overview tier

MODALITY 2
Member Interactive
Multi-day, on site · The DCAM detail tier

MODALITY 3
Online and Webinar
Self-paced, plus a live webinar · Maple LMS learning pathways

Original Five Working Groups



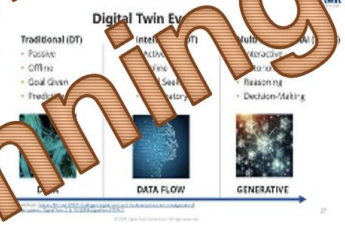
Capabilities Periodic Table v1.0



Platform Stack Architectural Framework



Digital Twin Evolution Multi-Agent Gen AI



Testbeds Portfolio Announced



AI Agent Capabilities Framework & Toolkit v1.0



* -12 Working Groups
-12 Technology Showcases
-21 Testbeds

- Preliminary - In Planning

22 Testbeds — live evidence per module
3 Living labs — Rowan DE Hub · Oak Ridge HS · Xaba
21 Publications — frameworks, papers, guides
129 Webinars — recorded, largely uncataloged
45 Blog posts — applied member practice
19 GitHub repos — ontologies, toolkits, parsers

DOMAIN MODULES — EVERY WORKING GROUP IS ALSO A MODULE

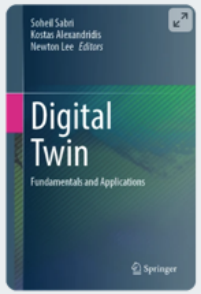
badge = testbeds available to substantiate an expert-level deeper dive

Manufacturing	Healthcare	Academia	FinTech	Agriculture	DC Neo	Energy	Mobility	Aerospace	CTAM	Quantum	Cultural
11 testbeds	5 testbeds	7 testbeds	0 testbeds	0 testbeds	3 testbeds	7 testbeds	2 testbeds	2 testbeds	16 testbeds	2 testbeds	1 testbed
vertical ready	vertical ready	vertical ready	no vertical yet	no vertical yet	vertical ready	vertical ready	vertical thin	vertical thin	vertical ready	vertical thin	vertical thin

Entry modules → Mid modules → Expert modules → Assessment → DTC Accreditation

Get to know - Digital Twin Consortium

DTC	
Resources	• Publications • Blogs • Podcasts • Webinars • Videos • Glossary
Initiatives	• Testbed Portfolio • Technology Showcase • Digital Twin Glossary
Tool Kits	• Capabilities Periodic Table • AI Agent Periodic Table • Open Source
Ecosystem	• Regional Branch Organizers (RBOs) • Liaisons • Ambassadors
Website	www.digitaltwinconsortium.org



Digital Twin

Fundamentals and Applications

Book | Jan 2025

Overview

Editors: Soheil Sabri, Kostas Alexandridis, Newton Lee

- Provides a well-rounded overview and demonstration of digital twin and digital transformation technologies
- Explores and showcases how digital twins advance our ability to address and solve contemporary problems
- Links state-of-the art theory, methodology and practice across academic, governance and industry institutions

Led by Academia & Research WG Co-Chairs

Contributions From:

- UCF
- CSDILA
- OC Survey
- Institute for Education, Research and Scholarships
- Georgia Institute of Technology
- University of Leeds
- Aker BP
- RWTH Aachen University
- Agile Fractal Grid
- Digital Twin Institute

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Advancing Innovation and Business Outcomes



Innovation

Thought Leadership

Non-traditional approaches to problem solving using Unconventional thought process



Collaboration

Force Multiplier

Engage with industry leaders, innovators, researchers, and others to develop and implement advanced technology



Leadership

Establish Authority

Bring Expertise and Knowledge to forefront Drive IndustryTransformation



Growth

New Revenue Sources

Ability to recognize and rapidly execute on market opportunities

Learn More:

www.digitaltwinconsortium.org

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