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THE DIGITAL TWIN

Cities for outcomes

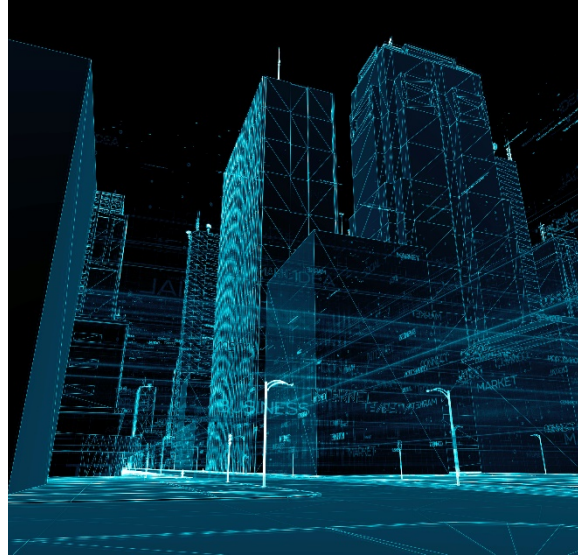
ASEAN Australia Smart Cities Trust Fund

Adam Beck, Executive Director

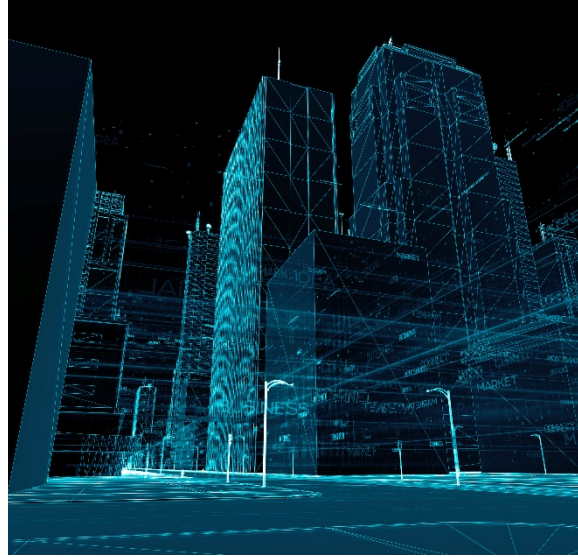
Smart**Cities**Council® Liveability
Australia New Zealand Workability
Sustainability



@smartcitiesanz



A digital replica of a physical thing.



A digital replica of a physical thing.

An accurate data rich
virtual model of an
asset.

Asset lifecycle design, construction and performance data.

A virtual representation of a physical
product, asset, system, or network
(level of granularity) synchronized in
real-time to the physical object through
sensed data and connected smart
devices, mathematical models and real
time data elaboration.

An object that exists in real life, and has a digital record of its
properties/attributes (hence twin).

Digital 3D representation of reality

Virtual 4D rendering of a city: Space, time,
(ideally live) user data.

A continuous body of knowledge that
captures, conform and co-exists with
the understanding of the subject's state
of reality.

An exact digital representation of a
physical asset.

A digital representation of a physical entity...not
just a 'dumb' copy but a smart digital parallel.

Virtual digital copy of the actual asset in its current status.

Digital 3D representation of reality.

A digital version of the physical world.

A digital replica of a physical asset.

DEFINITION

...BENEFITS

Visualise proposed scenarios
Powerful analysis in 3d.

Improved planning and design, lower construction/QC costs, dynamic estate management driving new service and business models.

Better design, more efficient construction and optimised operations.

Information updating & uniformity (tenant contracts, maintenance, crowdcontrol), communication (BMS), data analysis and creating new insights (automated valuations, physics analyses).

Real time insight.
Predictive capability.
Hindsight for evidence based decisions.

Integrated monitoring.
Integrated planning.
Strategic scenario testing.

Automation.
Efficiency.
New business opportunities.

Ability to quickly gather 'live' insights.
Ability to use these insights to control, predict and manage.

Manage costs, complexity, operations and management in real time.

Delivery of extra value.

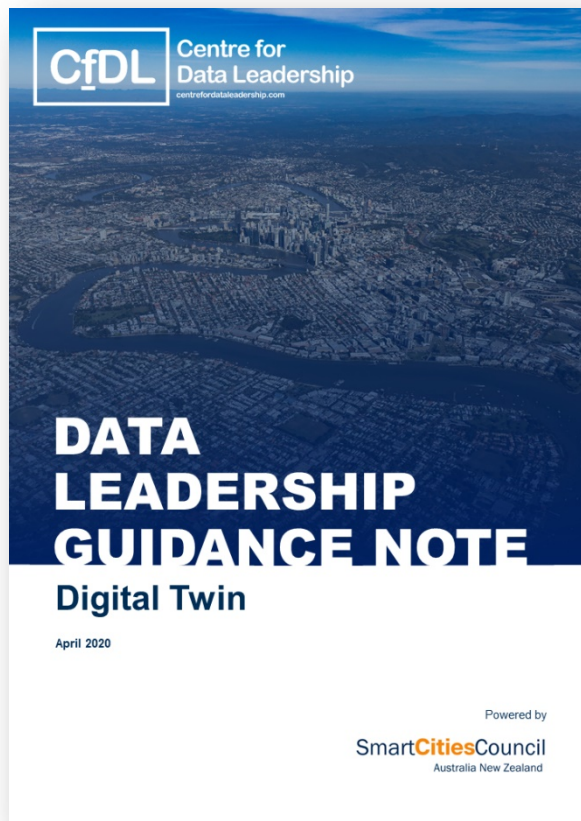


The Digital Twin...



Sensing
Processing
Analytics

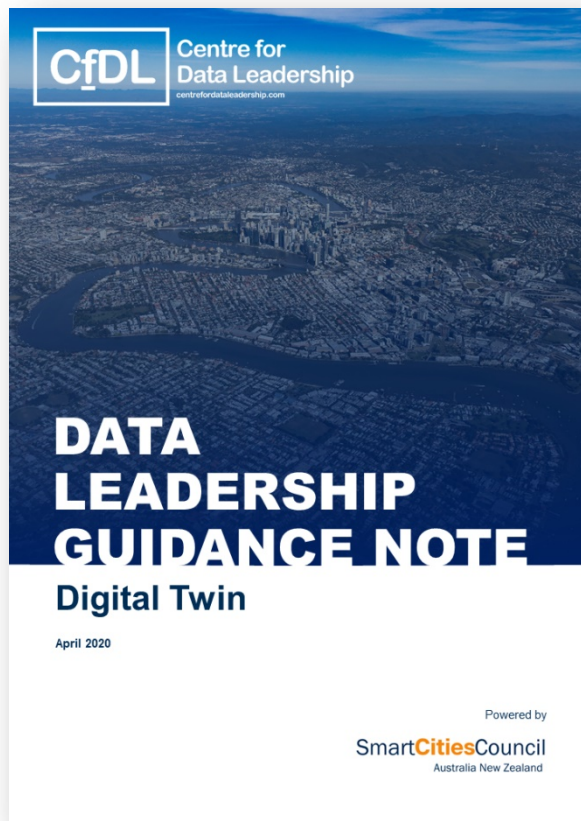
...comes alive.



As of today, there are no (s)(S)tandard's for what is being called a Digital Twin.

There are the Gemini Principles, ISO 23247 under development, CDBB/BSI Digital Twin Standards Framework and ISO Working Group JT-001-02 AG 11 Digital Twin.

But, there are still no standards...



As a minimum, a Digital Twin must ingest the following data sets:

1. Geometric and graphical data
2. Geospatial reference data
3. Asset attributes (natural, physical, social, economic)
4. Management data
5. Real-time asset performance and utilisation data.

A Digital Twin is not a Digital Twin until it provides the following minimum capabilities:

1. Connected - there is a 'live' connection between the digital replica and the physical/natural world
2. Integrated - it checks and links multiple data sources
3. Visualise - it provides visualisation of real-time multisource data
4. Analysis - federated data sets can be processed, modeled, analysed and simulated
5. Secure - information is managed in a way that reduces its risk of being compromised

The Digital Twin

The diagram illustrates the data sources for 'The Digital Twin'. A central dark blue cloud-like shape labeled 'The Digital Twin' is connected by vertical lines to a horizontal dashed line. Below this line, various data sources are listed, each connected to the line by a vertical line. The data sources are: 'The City budget', 'Greenhouse gas emissions emitted per hour of all commercial building stock', 'Hospital bed vacancy rates', 'Community Happiness Score', 'Utilisation rates of CBD kerbside', 'Real-time air quality', 'GDP output by sector', and 'Urban flooding risk register'. The text 'The Internet' is positioned at the right end of the horizontal dashed line.

The City
budget

Greenhouse gas
emissions emitted
per hour of all
commercial building
stock

Hospital bed
vacancy rates

The Internet

Community
Happiness
Score

Utilisation
rates of CBD
kerbside

Real-time air
quality

GDP output by
sector

Urban flooding
risk register

The Digital Twin

*The tool for directing investment in the most sustainable infrastructure and citizen services with precision like we've never seen, that will **accelerate** climate action, productivity and wellbeing of the community.*

Top Resources | The New Zealand Digital Twin Forum



The Forum

'The Forum' is the heart of the Digital Twin Hub community. This is where we exchange ideas, innovations and most importantly - our success!

Join us.

Explore +

The Australia | New Zealand Digital Twin Hub

Welcome to the Digital Twin Hub

The Digital Twin Hub is a community platform created for those who own, create or participate in the Digital Twin ecosystem and wish to learn more, or participate in the creation of a thriving digital twin market place in Australia and New Zealand.

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Digital Twin Sessions #2: Views from the Digital Engineering World

In this session with Serena Moreno,
Production & Operations Practice Lead a

Digital
Centre

In this section, we will discuss the role of the Chief Technology Officer (CTO) in a company. The CTO is responsible for the overall technology strategy and for ensuring that the company's technology infrastructure is secure and reliable. The CTO also oversees the development and implementation of new technologies and is responsible for the company's intellectual property.

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Welcome to Digital Twin Week 2020, the premier platform for showcasing, exchanging and networking around all things Digital Twin.

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A nighttime photograph of the Sydney Harbour Bridge, illuminated with warm orange lights. The bridge's steel structure is clearly visible, and its lights reflect on the calm water of the harbour below. In the background, the Sydney city skyline is lit up, with several tall skyscrapers, including the Sydney Tower One, standing out against the dark night sky. The water in the foreground shows some light trails from boats, adding a sense of movement to the scene.

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