THE DIGITAL TWIN

Cities for outcomes

ASEAN Australia Smart Cities Trust Fund

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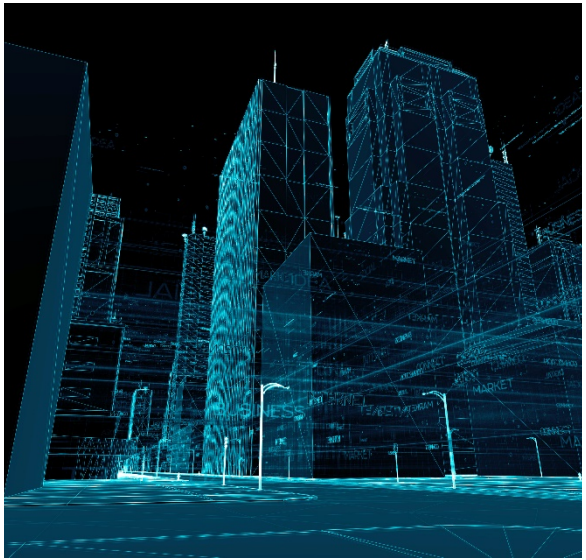
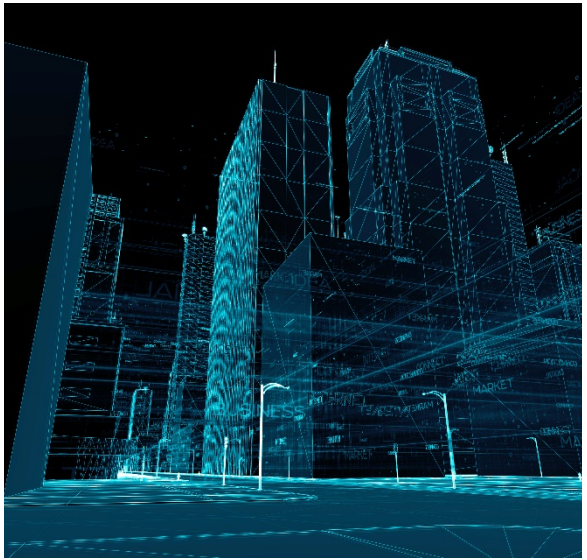
SmartCitiesCouncil® Australia New Zealand
Liveability
Workability
Sustainability

@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.

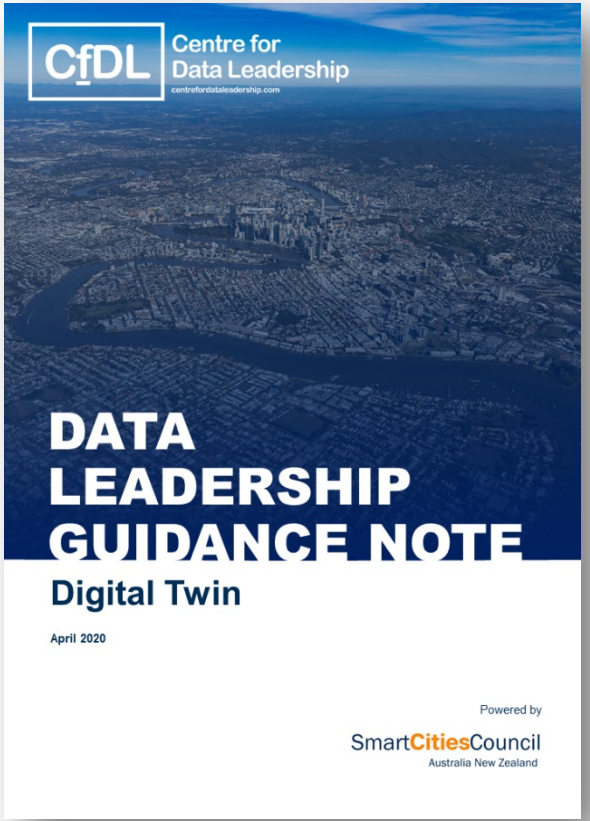
Ability to quickly gather ‘live’ insights.
Ability to use these insights to control, predict and manage.
Manage costs, complexity, operations and management in real time.

Delivery of extra value.

The Digital Twin…

Sensing
Processing
Analytics

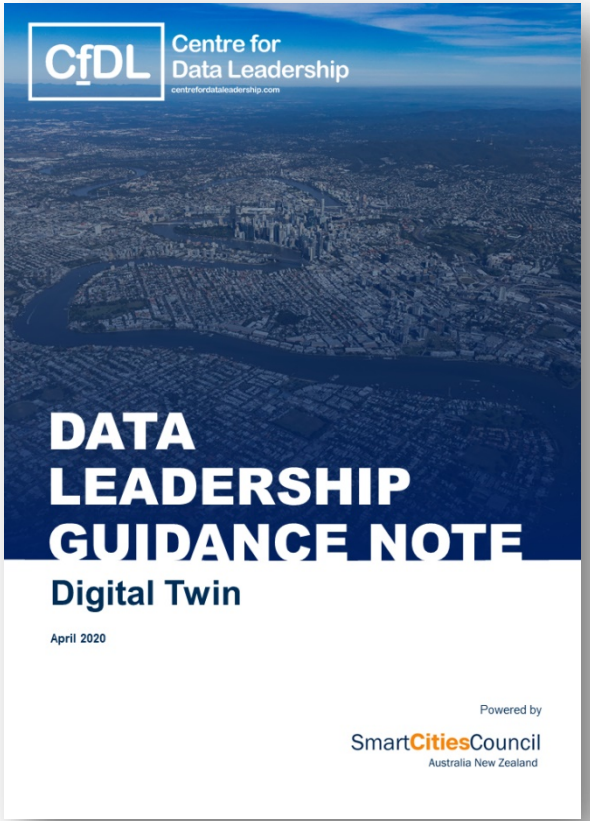
…comes alive.



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…

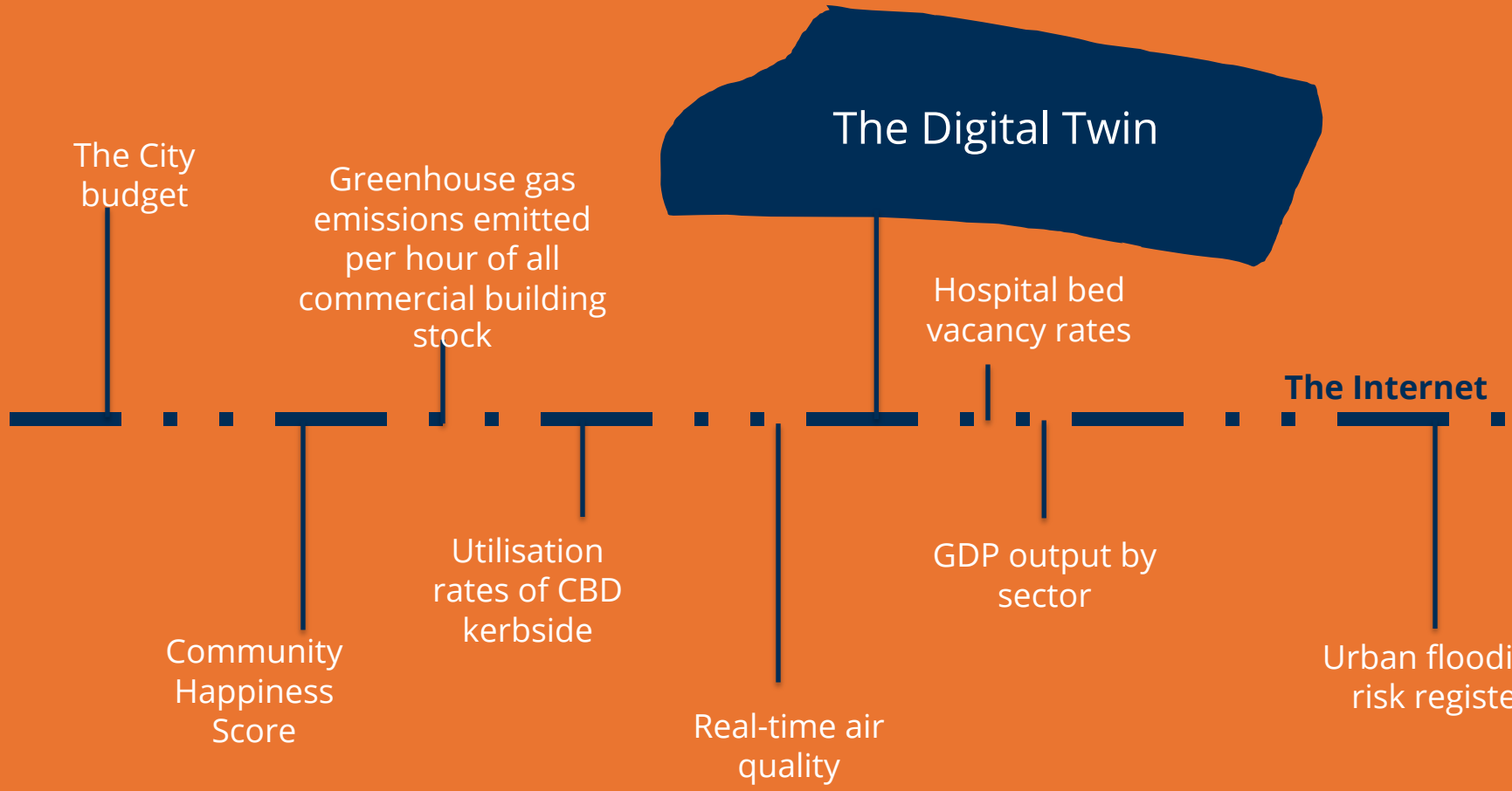


As a minimum, a Digital Twin must ingest the following data sets:

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.

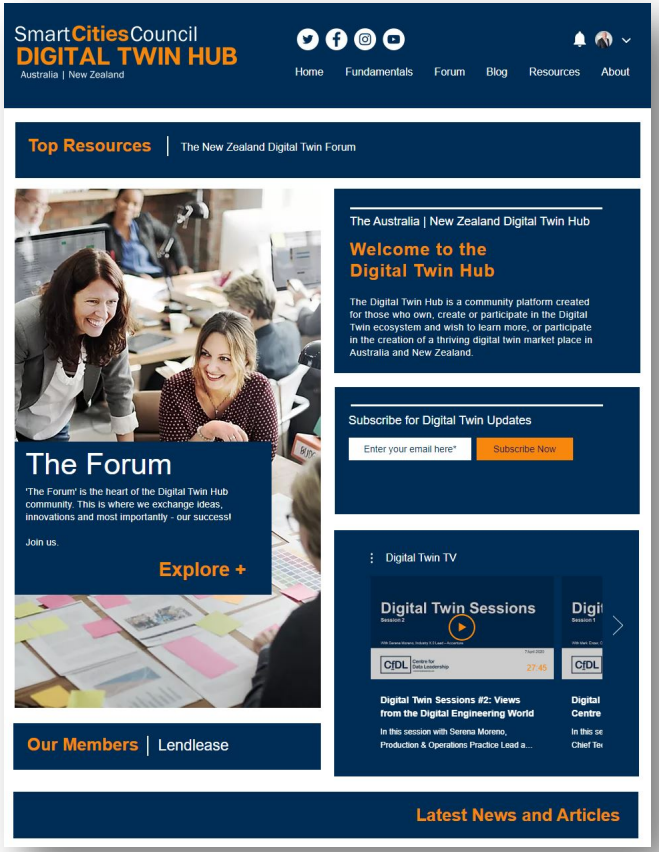
A Digital Twin is not a Digital Twin until it provides the following minimum capabilities:

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 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.**



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