# **xD** Twin

Digital Twin for Built Environment

"Built environment management using open standards"



Jarkko Sireeni CEO and Founder xD Visuals Oy

Chair of City Planning Group buildingSMART Finland



## WDBE 2022 Awards winner The best use of open standards

The WDBE community includes over 2000 professionals from 54 countries. We are CDOs, CTOs, CIOs in real estate and construction, government and city officials, architects, engineers, other experts as well as researchers working with BIM, VDC, AR/VR, Big Data, analytics, IOT, virtual project delivery and more.



Jan Saar, Head of Digital Construction, Ministry of Economic Affairs and Communications for Estonia, announcing the winner of WDBE 2022 Awards for category "The best use of open standards" (29.10.2022, <u>https://kirahub.org/en/wdbe/</u>)

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Whole Earth with terrain, maps and 350M buildings in 3D Integrated into xD Twin

Finland point clouds and 3d buildings (CityGML)

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### **Digital Twins in Multiple Scales**

Global digital twins

FINILAND

- National digital twins
- Regional digital twins
- City digital twins

Helsinki region public transportation network

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City digital twin Helsinki, Finland

Point cloud based City Model, Melbourne, Australia

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### **Digital Twins for Cities**

• Map and GIS (GML, WMS, WFS)

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- Point clouds (LAS, LAZ)
- Photogrammetry (3DTiles)
- Schematic City Models (CityGML)

Photogrammetry based City Model, Helsinki, Finland

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CityGML based City Model, Helsinki, Finland 2 20 20 44 City of Espoo land use maps (WMS) Espoo, Finland

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#### Helsinki public area register (WMS) Helsinki, Finland

### **Open GIS**

- Over 50% project initial data is GIS
- Maps, land use, nature, traffic, energy, ...
- Raster data with attributes (WMS)
- Vector data with attributes (WFS)

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Helsinki streets and city blocks (WFS) Helsinki, Finland • / × @ 0

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Air quality in Helsinki (WMS) Finnish Meteorological Institute

Trigoni towers, winner of architectural competition, Helsinki, Finland

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#### Building BIM for Architecture Helsinki, Finland

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#### Building BIM for MEP / HVAC Helsinki, Finland

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Building BIM for Structures Helsinki, Finland



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DEXEC

**Open BIM for Buildings** 

- 3D / CAD design models
- BIM for Architecture (IFC)
- BIM for Structures (IFC)

and has a should have seen as

• BIM for MEP / HVAC (IFC)

Street BIM project Helsinki, Finland

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### Bridge BIM project

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#### **Open BIM for Infrastructure**

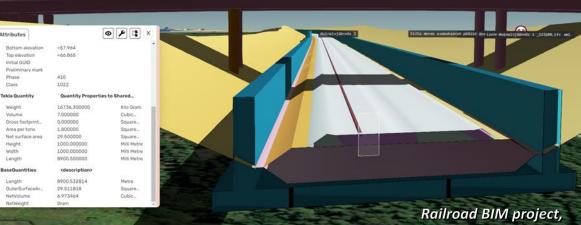
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- Streets and networks (LandXML, IFC)
- Bridges and tunnels (IFC)
- Road (LandXML, IFC 4.3)
- Rail (LandXML, IFC 4.3)

Highway BIM project, Ylämylly, Finland (© Destia)

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Virtual Reality (VR) allows users view data from inside

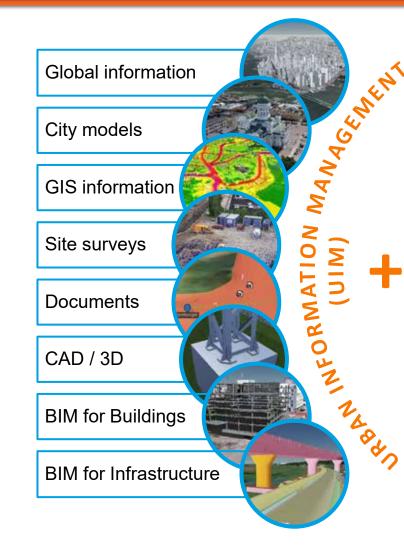
Augmented Reality (AR) allows users view data around them on-site

#### **Built Environment Metaverse**

- Data is already georeferenced around us
- VR takes you inside the data
- AR shows the data around you
- Game engines opens new possibilities

elsinki city model inside Unreal Engine 5 © City of Helsinki, xD Visuals Oy

## **xD** Twin – Digital Twin for Built Environment



## *Information + Processes = Productivity*



#### Collaboration

to co-develop and optimize project solutions

Combined "one source of truth" project model with all disciplines and life cycle phases



#### Coordination

#### to maximize productivity and quality

Integrated issue, task, approval and QA workflows with 4D schedules, 5D costs, 6D sustainability, ... xD



#### Communication

#### to increase acceptance, transparency and trust

Visual and interactive project presentations with citizen and stakeholder participation workflows

## **Modern cloud solution**

"Completely cloud-based SaaS solution and flexible licensing ensures that everyone can participate and benefit from the same commonly shared and always up-to-date information and workflows."

## Localized in your local language



*Computer browser* 

## With any smart device

## Easily, anywhere, anytime

Tablet browser

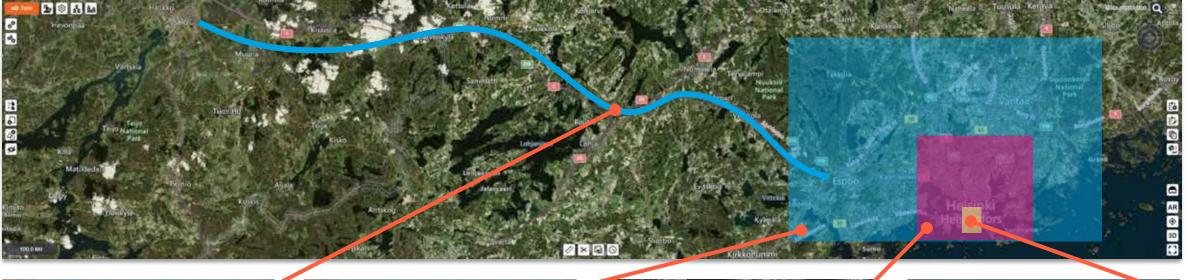


Smartphone browser



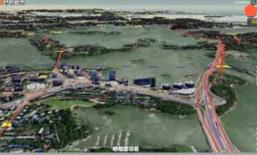
Model data © Väylä 2021

## **Projects in All Scales**





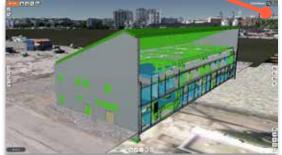
National (transportation, energy, natural resources, ...)



**Regional** (traffic, water, waste, circular economy, ...)



City (city planning, traffic, environment, ...)



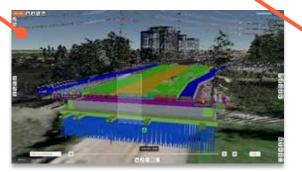
Area (buildings, infrastructure, landscaping, ...)

## **Projects in all Life Cycle Phases**

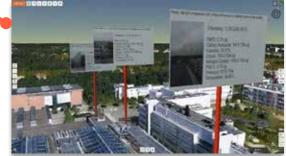


Planning (ideas, sketch, volumes, requirements, ...)

Design (coordination, collaboration, communication, ...)



Construction (survey, as-built comparing, scheduling, tasks, BIM on-site, ...)



Hiedanranta Area Plan, Tampere

Maintenance & Operation (service manuals, digital twin, start city, ...)

## **Projects of any Type**



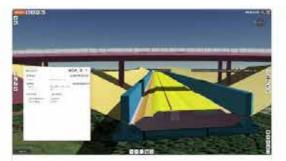
**City Planning** 

Manage and collaborate city plans with citizens with a 4D digital twin of a city and feedback tools



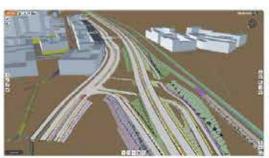
Architecture

Manage architecture in their real world location and integrate into city models. Compare architecture competition alternatives with VR and AR.



Infrastructure

Manage even large scale infrastructure projects and combine designs with survey, drone and as built data.



Transportation Manage harbor, alroort and logistics center projects by combining infrastructure, buildings, and city models.



#### Environment

Bring landscaping and environmental planning five with AR and VR. Manage environmental effects analysis in large scales.



#### Energy

Manage geographically large distribution networks, windmill parks and power plants in their real world surroundings.



#### Industry

Combine buildings, machines, processing plants and infrastructure into one digital twin of the facility.



#### **Real estate**

Show apartments and housing virtually in their real location and surroundings with city model integration. Thank You! www.xd-twin.io

### Contact: xD Visuals Oy



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