



# Digital urban planning is key to creating smart cities

Combining Big Data, smart technologies and unprecedented accessibility, Digital Twins are reshaping city planning for the digital age.



By Team Nomoko

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The digitalization of our cities is inevitable. Indeed, it's already happening across many aspects of our lives, from the beginnings of the **Fourth Industrial Revolution** to the emergence of the Internet of Things.

Described by professor Klaus Schwab, founder and executive chairman of the World Economic Forum, this digital revolution is "characterized by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries, and even challenging ideas about what it means to be human."

These new spatial technologies are powered by **Digital Twins**. They enable us to plan, build, measure, manage and predict using real world data through digital platforms like **Praedia** and **spatial services** like 3D models. Making the physical world digital and interactive opens up many possibilities for the people, businesses and municipalities involved in shaping our cities to fundamentally change how they plan and work on projects.

## Planning processes unfit for the digital age

Current urban planning and development processes are drawn out, laborious, time consuming and, at scale, prohibitively expensive. They are, typically, analog.

Let's take as an example the process for submitting a building permit. But before you can apply for that permit, you'll first need to check if any development falls within the relevant city's planning guidelines, which will include an entirely different application process with its own sets of fees and rules to adhere to.

Once planning is granted, the building permit application requires the applicant to submit 150+ papers covering everything from multiple application forms for each relevant permit (they may be different for construction, plumbing, electrics etc) to detailed scale drawings, as well as reports on everything from energy usage to environmental impact. Once submitted, these physical papers and plans typically take three to five months to process for a decision – if everything goes smoothly.

Apart from the obvious problems such timescales and demand on resources can create, there

are more pernicious side effects as well. Traceability of information and accountability of decision making is inevitably fractured, and that can lead to resubmitting applications at the cost of more time and money.

Overall, it is an approach and process entirely incompatible with the digital ecosystem the real estate (and almost every other) industry is heading for. But by individually digitalizing different parts of the process – assets, formats, interoperability – we will over time create a homogenous digital whole that transforms the planning and development process from the ground up.



**Digitizing 2D plans into 3D models helps digitalize the entire project planning process, which makes it cheaper, faster and more efficient**

## **From analog 2D plans to digital 3D visions**

A first obvious but exponential step is the transformation of working practices from 2D to 3D. The world around us is 3D, so operating in a 3D digital environment makes everything more natural, more realistic and more intuitive – it's what we call 'spatial context'.

Spatial context allows planners, architects and developers to visualize real estate projects in entirely new ways. And more importantly, it allows them to communicate those ideas clearly and effectively with their stakeholders – from the municipalities granting planning permissions to the communities they will directly affect.

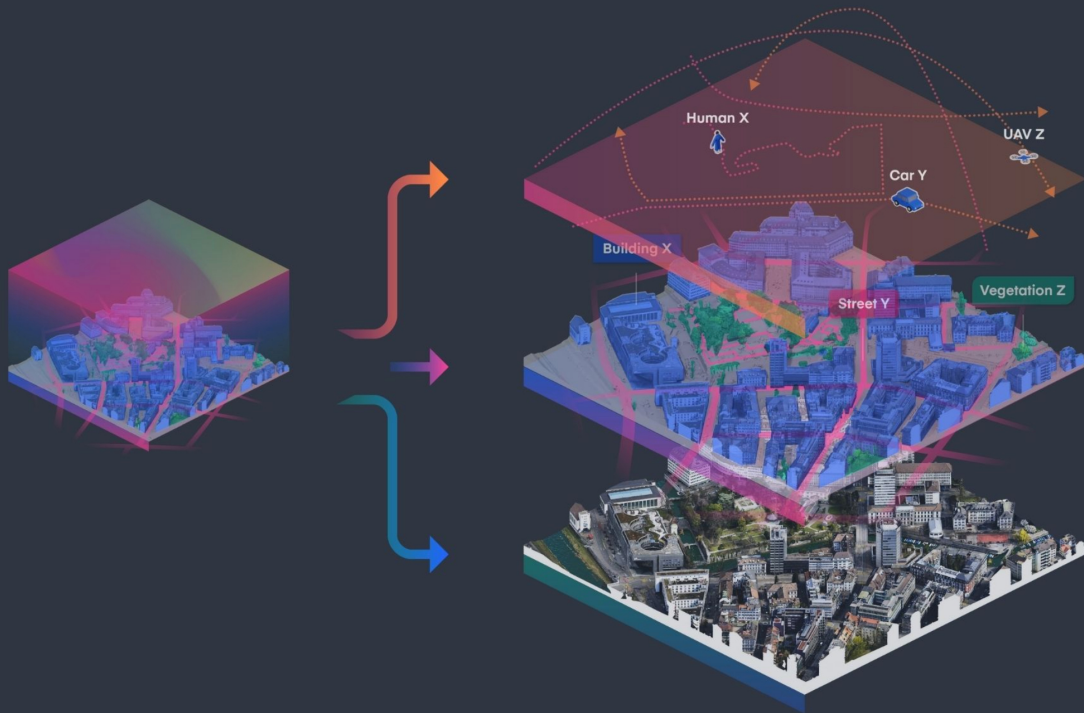
This means making 3D models digital is equally as important – to facilitate that ease of sharing and communication. Creating a digital 3D model that's shareable via a simple URL harmonizes and expedites the entire planning and applications process. Instant sharing with multiple stakeholders, consolidated feedback and real-time updates are all now possible. Applications can be formatted and automated based on model data and multiple applications can be conducted concurrently rather than in a linear fashion. No more hazy paper trails, lack of accountability and inexplicable time delays.

Digital transformation also enables another benefit that's fundamental to maintaining a competitive and healthy commercial balance. It democratizes the planning and development process for all companies, big and small. 3D digital models are more affordable than physical models and the myriad paperwork they create. They are multi-purpose across a range of areas and outputs and can be reused over and over again, making them extremely cost effective.

Accuracy and detail minimizes mistakes and rejections, which brings down fees. Suddenly, smaller developers can feasibly compete against industry giants on a level playing field.

## Digital Twins empower creativity and deliver certainty

Data-based, photorealistic, interactive, editable and able to update in real time where the data is available, Digital Twins are reshaping cities at every stage, from initial planning to ongoing management.



**Our 3D models incorporate layers of spatial, building and other types of data that add benefits for every stakeholder**

- **Virtual experimentation and data-led decision making.** Test and refine planning scenarios to optimize building location, layout, orientation and efficiencies. Incorporate CAD models to test designs and run ultra-precise simulations for everything from shadow casts to noise analysis, optimal solar panel allocation to 5G propagation.
- **Research and support for new initiatives.** Experiment with and adopt new approaches to community-led living that offers better conditions to live, work and play and align them more easily with planners, municipalities and authorities to make buildings and cities more durable and sustainable.
- **One holistic platform as a single point of entry.** Say goodbye to disparity, miscommunication and repetition. A Digital Twin is a single point of entry for everyone involved at every step of the process (from planners to managers) – all seeing the same version of the same thing represented at the same point in time.
- **Big Data made accessible, understandable and actionable.** Tap into unlimited, trusted and verified data sets from a range of government and private sources. From cadastral, zoning and transport maps to highly detailed individual property information – floor plans, plot sizes, building orientation, historic retail and rental values, and development potential to name but a few.
- **Access and accessibility.** Create realistic, interactive and easy-to-use visualizations that

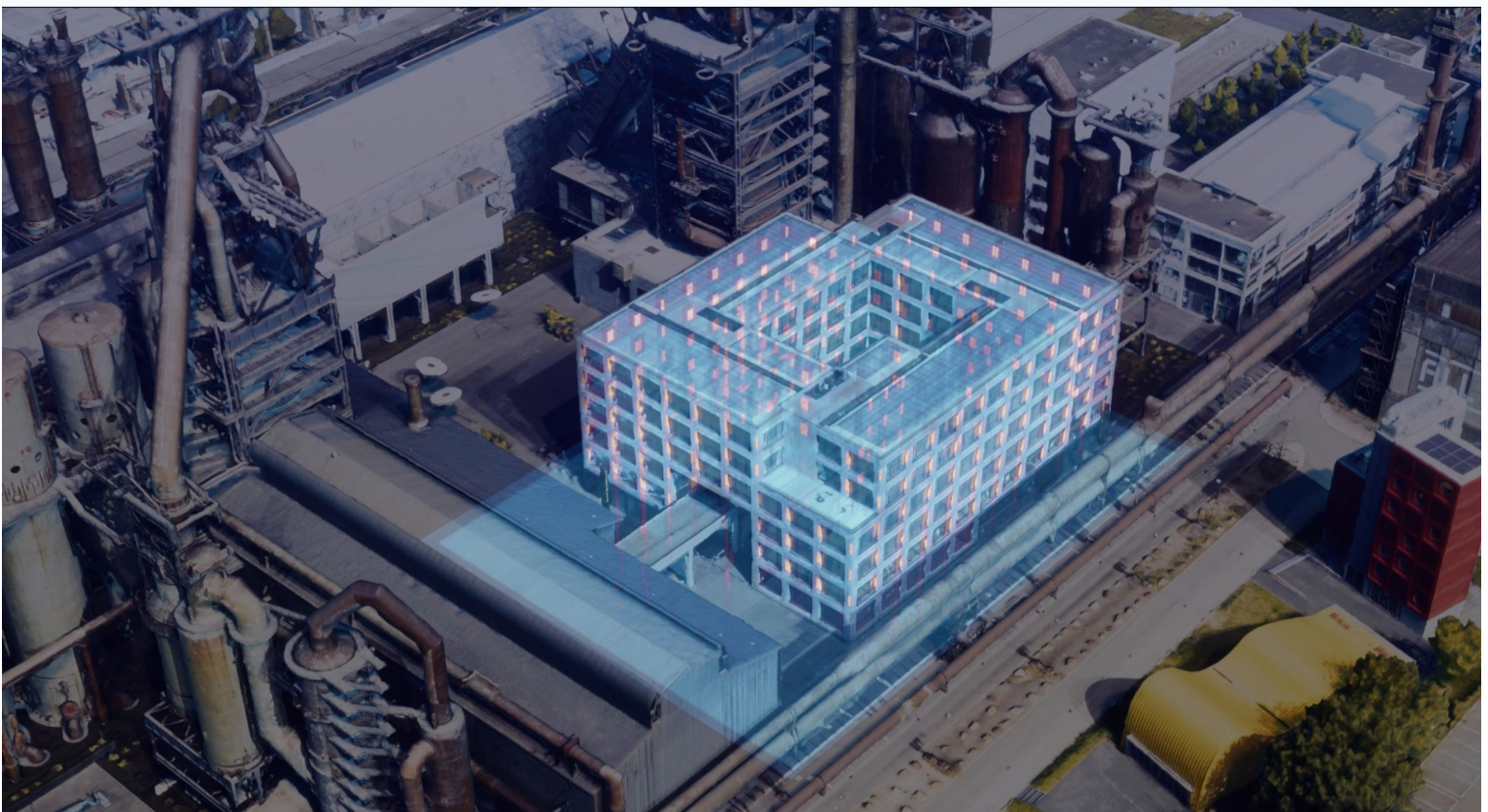
give non-technical people the ability to interpret and understand plans and developments, even at scale. Incorporate terrains and scenarios that are hard to model in analog or 2D – bodies of water, vegetation, changing infrastructures.

For stakeholders across every part of the planning process, these attributes deliver immediate benefits.

- **Governments** – the Digital Twin is a critical enabler in the emergence of smart city initiatives.
- **Municipalities** – project applications can be reviewed in unprecedented detail to better understand impact on environments and communities, improve sustainability and expedite workflows.
- **Architects** – integrating CAD models and designs helps visualize, test and plan projects. Outputs like orthophotos and flythrough videos can be shared instantly and Digital Twins reused on multiple projects.
- **Developers** – improved workflows, collaborative feedback and concurrent applications reduce costs and improve investor awareness and confidence.
- **Residents** – features like geo-visualization, analytical tools and semantically-embedded 3D information improve awareness, empower opinions, create a channel to influence decision making and provide opportunities to enrich communities.
- **Businesses** – real-time data and analytics enable specialized services, stabilize resource planning and provide opportunities for growth.
- **Research community** – innovation and opportunity is rife. Research and development will develop tools for multi-party collaboration, interoperability, deep analysis and test-bedding.

## Nomoko is powering digital transformation in real estate

We're already forging ahead with our [spatial services](#) and [Praedia](#) platform, providing digital solutions to age-old problems for architects, planners, developers and municipalities. We believe truly transformative digitalization comes from a collaboration between public bodies and private organizations that can together deliver on the potential smart digital cities offer.



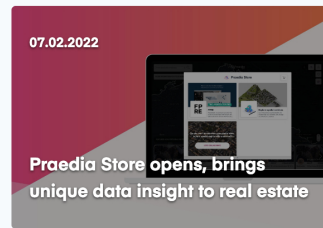
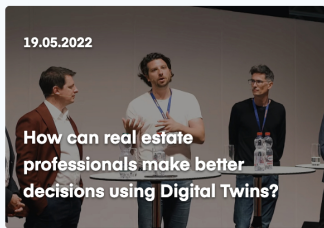
**A screenshot of the 3D model of the Luxembourg Institute of Science and Technology (LIST) HQ in Luxembourg, captured and created by Nomoko**

By collaborating with entities like **LIST** and **Myni Gmeind**, we're exploring new use cases and applying Digital Twin technology in exciting and profound new ways. We're participating in other areas too, such as the **Swiss Blockchain Hackathon 2021** to find new ways to **solve existing real-world challenges** using cutting-edge blockchain protocols.

Want to find out how Digital Twins can reshape your processes to work smarter and build better?

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