



Fujitsu

124,000 employees worldwide, over 3,000 in Germany

Industry: IT



Hexagon

24,500 employees in 50 countries, around 200 at Hexagon's Safety, Infrastructure & Geospatial Division in Germany

Industry: Software

ORGANIZATION DESCRIPTION

Fujitsu's goal is to make the world more sustainable by building trust in society through innovation. As the digital transformation partner of choice for customers in over 100 countries, our 124,000 employees are working to tackle some of humanity's biggest challenges. Our range of services and solutions is based on five key technologies: computing, networks, AI, data and security, and converging technologies, which we bring together to bring about sustainable transformation.

As a full-service IT provider, our focus is on data & AI, hybrid cloud, SAP solutions, workplace solutions, consumption-based IT and sustainable data centres.

Find out more: <https://www.fujitsu.com>

ORGANIZATIONAL VISION

Fujitsu's vision for 2030 is to become a technology company that realises Net-Zero through the development, improvement and use of digital services. To realise this vision, Fujitsu is committed to a Sustainability Transformation (SX) that will transform our business to have a better impact on the environment, the economy and people's well-being.

We always work in a people-centred way to enable optimal physical and digital experiences, use data-driven processes and innovative technologies to strengthen resilience in companies and society and rely on secure digital connections and services.

Hexagon is the world's leading provider of digital reality solutions that combine sensor, software and autonomous technologies. We use data to increase efficiency, productivity, quality and safety in industrial, manufacturing, infrastructure, mobility and public sector applications. Our technologies contribute to the design of production and human-connected ecosystems that are increasingly connected and autonomous - for a scalable, sustainable future. Hexagon's Safety, Infrastructure & Geospatial division improves the resilience and sustainability of critical services and infrastructure for the benefit of communities worldwide.

Learn more: <https://hexagon.com>

Hexagon's vision encompasses a future in which data is used and utilised comprehensively, autonomously and sustainably for the benefit of all. Hexagon has set itself a net zero target for the entire value chain by 2050. The sustainability targets are divided into milestones for the years 2025, 2027, 2030 and 2050. These include, for example, the reduction of CO₂ emissions and the expansion of the use of renewable energies. One of the most prominent initiatives to support sustainable change involves profit-orientated investments in green tech initiatives using Hexagon technologies, including digital twins.

PROBLEM STATEMENT

Description of the problem and formulation of the question

Urban Digital Twin meets Social Sustainability

Over 75% of people in Germany live in cities or urban centres. As an urbanised society, the current situation in our living environment and future urban planning is of great importance, as it has an influence on our everyday lives and well-being that can hardly be underestimated. In recent years, buzzwords such as "smart cities", "urban data platforms" and "digital twins of cities" have become established, promising digitally supported, optimised management and further development of cities. But what exactly does this mean?

A digital twin is a virtual representation of a physical object, system or process. This can be a single product such as a food processor, a production process in manufacturing, a park or an entire city. Ideally, this digital representation is linked to continuous data streams that are generated in real time by sensors, machines or users. This creates a replica of a city, for example, that is as close to reality as possible, which in turn enables analyses, optimisations, automated reactions, simulations and planning.

In an urban context, digital twins have been used for a long time for various issues. This often involves building development, traffic optimisation or the representation of barrier-free routes. Digital twins and the simulation of environmental data (e.g. air quality, heat distribution, heavy rainfall) are also being used to take account of the ongoing climate change. However, climate change and urbanisation are just two of the challenges facing our society.

The development of the age pyramid and sustainable digitalisation place additional demands on us, increasing the complexity for those involved. Due to their integrative concept, digital twins are potential tools for responding to these challenges.

And also against the background of the ESG criteria¹, these digital solutions must be appropriately selected and used sustainably, e.g. they must be functional, application-orientated and user-friendly, but also resource-efficient (in their creation and operation).

How can a digital twin help with intergenerationally equitable and sustainable urban planning, taking the context into account?

Step 1: Digital twin for intergenerational equity

- What characterises **generation-friendly** urban planning and its use? What aspects play a role in this (e.g. accessibility, accessibility, education and culture, crime rate)?
- What **data** is available or required to map and plan these aspects?

Step 2: Goals and measures must be SMART²

- Is a digital twin indispensable for this, or are there alternatives? Does it offer advantages in the context of the **various stakeholders** (e.g. population, various authorities within a city, civil society actors)?
- What criteria can be used to measure and evaluate the **benefits of using** digital twins in the ESG context for the implementation of measures?



JOKER QUESTION

What relevant criteria are there to measure "Liveability³", how can these be integrated into a digital twin and what benefits can be derived from this?

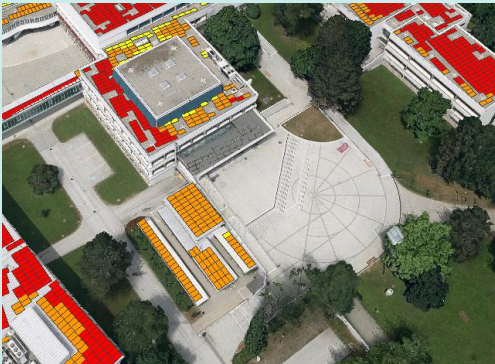
OTHER

For example, existing guidelines, previous efforts, and strategies for responsible AI, digital ethics, or digital responsibility.

What is the general starting point for digital twins?

- 3D city model
- Geoinformation, sensor and socio-demographic data (see attached data table)
- Urban Data Platform (UDP)

You are welcome to include other data sources or ideas for these. Take a look at the various use cases and applications for a better idea of the possibilities.



Example of Klagenfurt: 3D city model with potential areas for photovoltaics and solar thermal energy determined by GeoAI (© Hexagon)



Example of model positioning: Interactive urban planning (© Hexagon)

Digital twins in an urban context:

- [Expert paper "Urban digital twins": German Association of Cities \(staedtetag.de\)](https://www.staedtetag.de)
- [Lecture International Forum on Urban Digital Twins](#)

Digital twins, measurability and ESG:

- [\(1\) Environmental, Social and Governance - Wikipedia](#)
- [\(2\) Organisation handbook - SMART rule / SMART method \(orghandbuch.de\)](#)
- [Effects of smart city measures on cities \(egovernment.de\)](#)
- [Digital Twin Models with ESG Methodology as a Tool for the Transformation of Cities in the Area of Transport and Energy | IEEE Conference Publication | IEEE Xplore](#)
- [Requirements for a Digital Twin for Energy, Social, and Governance Data of Commercial Buildings | SpringerLink](#)

Use case examples:

- [Digital twin - Klagenfurt](#)
- [Fujitsu launches 'digital twin' trial on Isle of Wight for e-scooter sharing service : Fujitsu Global](#)
- [Welcome - Connected Urban Twins](#)
- [Increasing Safety and Government Transparency in Baton Rouge](#)

Liveability:

- [\(3\) Global Liveability Index 2024 - Economist Intelligence Unit \(eiu.com\)](#)
- [Index Methods and Sources - AARP Livability Index](#)
- [VL ETH Zurich_160228_Criteria_of_Livability \(ethz.ch\)](#)