# DT4HEALTH – Digital Twin Platform for Intelligent and Sustainable Management of Hospital Facilities


## Summary

The DT4Health project was proposed as a response to the COVID-19 pandemic, which has had unprecedented impacts on the management of hospital buildings. Hospital buildings have had to provide space for patients, medical staff, and equipment storage while simultaneously imposing limitations on access by the teams responsible for managing the building. Additionally, there has been a need to adapt the space and its functionality quickly, ensure continuous control of air quality and adequate ventilation of spaces, develop digital management tools, and monitor assets in real-time.

The main objectives of the DT4HEALTH project between Portugal and Norway are to develop a Framework for the digital twin of hospitals that considers different target groups, enabling real-time monitoring and management of assets and building systems in the healthcare context. It also aims to improve the efficiency and effectiveness of built environment management operations by taking advantage of advanced technologies such as the Internet of Things, information modeling, and artificial intelligence. This study emphasizes the significance of using an integrated approach to develop digital twin technology to realize its full potential in the built environment industry. It puts forward a framework specifically designed for hospital facilities. The proposed framework comprises five key pillars: visualization, processes, information, sensors, and intelligence (Figure 1).

Furthermore, the project intends to improve the sustainability and resilience of buildings and infrastructures by optimizing the use of resources, reducing energy consumption, and enhancing safety. Recognizing the unique challenges of hospital buildings, the project emphasizes improving the interaction between buildings and infrastructure, optimizing the customer experience and internal operating systems.
The uniqueness of this project lies in the fusion of technological and management dimensions, emphasizing stakeholders' active involvement and contribution. Through these efforts, the partnership aims to improve the digitization of the Facility Management sector and promote economic growth. Thus, the project will explore the current state of the art of digital twins for managing the built environment in the context of hospitals, promoting the development of new tools, methods, and best practices for managing buildings, operations, and user experiences.

The collaboration between the Instituto Superior Técnico (IST) of the University of Lisbon and the Norwegian University of Science and Technology (NTNU) represents a significant effort with far-reaching impacts. This partnership is focused on creating new business opportunities and advancing research to actively contribute to reducing socio-economic disparities in Portugal and other countries in the European Economic Area with the support of grants from EEA Grants Portugal.

Principal Investigator Professor António Aguiar Costa leads the IST team, including Professor Inês Flores-Colen and PhD student Rodrigo Pedral Sampaio. Meanwhile, the NTNU team is coordinated by Professor Nora Johanne Klungseth and comprises Professor Marco Semini and master's student Sondre Sommerset Nordvik.


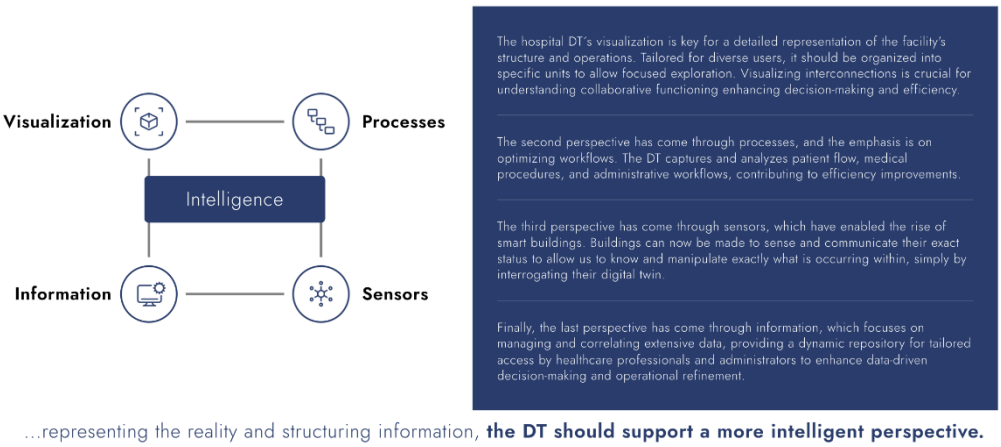


*Figure 1. Pillars of the Framework.*

CERIS : Civil Engineering Research and Innovation for Sustainability

**Project Reference**

DT4HEALTH

**Leading Institution**

IST-ID – Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento (Portugal)

**Partners**

NTNU – Norwegian University of Science and Technology (Norway)

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**Funding**

EEA Grants

**Period**

2023-2024

**Total**

1 465.23€

**CERIS**

1 465.23€

**Project Website**

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