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Building the Virtual Physiological Human

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EDITH

European Virtual Human Twin

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Vision

Virtual Human Twin (VHT) is an integrated multi-scale, multi-time and multi-discipline representation of quantitative human physiology and pathology. Its realisation through a collaborative distributed knowledge and resource platform is specifically designed to accelerate the development, integration and adoption of patient-specific predictive computer models, which will be used as clinical decision support systems for personal health forecasting or as methodologies for the development and de-risking of personalised medical products.

The vision of EDITH is to facilitate the realisation of the opportunities presented by VHTs for the benefit of patients, healthcare providers, regulatory bodies and industry, both within Europe and globally.

Mission

EDITH is a Coordination and Support Action (CSA), funded by the European Commission, which will capitalise on the developments of digital technologies, high performance computing, availability and access to research and healthcare data in Europe, with the mission of defining a roadmap to go from separated single organ systems, to a data-driven and knowledge-driven fully integrated multi-scale and multi-organ whole-body twin.

EDITH will facilitate this process by building an evolutionary ecosystem, driven by a consensus among the relevant European communities, and implemented through the aid of practical tools, such as a data/model repository and a simulation platform.

Objectives

To frame an **ecosystem** of digital twins in healthcare within the EU, EDITH is conducting a mapping of actors, initiatives, resources and barriers in the digital twins, with the aim of ensuring adequate clinical representation and fostering the integration of all relevant stakeholders such as developers, technology and infrastructure providers, end-users, regulatory agencies and HTA bodies.

To build a **roadmap** towards an integrated Virtual Human Twin (VHT), identifying the main research challenges and infrastructure needs as well as formulating clear policy recommendations. It will also address interoperability, computability and health information integration, identifying implementation needs/barriers and developing a strategy for the clinical deployment of the VHT model and its uptake in personalised clinical decision-making.

To develop a **federated** and **cloud-based repository** of digital twins in healthcare (data, models, algorithms and good practices), pooling together existing resources across Europe and providing access to relevant existing data and model repositories. The ecosystem will be leveraged to create a repository catalogue with available resources and recruit resources from the consortium and beyond.

To outline a **simulation platform**, supporting the transition towards an integrated VHT, that will be implemented as a public infrastructure, providing a one-stop shop to design, develop, test and validate single organ digital twins, and combine them with others for the integrated VHT models. Five use-cases (cancer, cardiovascular, intensive care, osteoporosis, and brain) have been pre-selected to be developed as prototypes to show the added value of a simulation platform.