

HÖGANÄS KOMMUN OCH DIGITAL TWIN CITIES CENTRE (DTCC)

DIGITAL TWIN CITIES

- ARCHITECTURAL DESIGN & CONSTRUCTION
- URBAN PLANNING & DESIGN
- MAINTENANCE & MONITORING
- DECISION SUPPORT

DESIGN

DECISION

VISUALISE

MODEL

SIMULATE

- CITIZEN ENGAGEMENT
- WHAT-IF SCENARIOS

WHY NOW?

EXPONENTIAL GROWTH OF COMPUTING POWER & DATA AI / IoT / VR / AR / BIM / CIM

CHALMERS UNIVERSITY OF TECHNOLOGY

TACKLING URGENT SOCIETAL CHALLENGES

- RESOURCE EFFICIENCY & CLIMATE CHANGE
- SOCIAL & SPATIAL URBAN SEGREGATION
- URBAN AIR POLLUTION, FLOODING, TRAFFIC CONGESTION, SPREADING OF FIRE & INFECTIOUS DISEASES, MICROCLIMATE, WIND COMFORT, PARKING, ...

Establish **Digital Twin Cities** as the foundation for digital planning, design, construction and management of sustainable, intelligent and inclusive Swedish cities and regions.





CHALLENGES AND SUCCESS FACTORS





KNOWLEDGE

TRANSFER

DIGITAL TWIN CITIES CENTER

DATA MANAGEMENT & INTEGRATION



COORDINATION

& INTEGRATION



STAKEHOLDER INVOLVEMENT COMMON DIGITAL TWIN PLATFORM STUDE

KUGGEN CHALMERS LINDHOLMEN

MATHIN

/irtual City @ CHALMERS

ORGANISATION

STAKEHOLDERS







MISSION

To develop an **open** multimodal data, simulation and visualization **platform** for interactive planning, design, exploration, experimentation and optimization of cities.

- For urban planning
- For citizen dialogue
- For research communication



TIMELINE



August 2019

Start preparation



November 2019

Signed centre agreement



February 2020

DTCC launch



March 2020

Kickoff meeting



End of 2020

Conference



DIGITAL TWIN PLATFORM (RA0)

RA Leads Anders Logg (Chalmers) Björn Skoogh (Sweco)

Objectives

Develop an open platform for interaction, design, experimentation and optimization of cities



MODELING & SIMULATION AT THE CITY LEVEL (RA5)

RA Leads

Fredrik Edelvik (FCC) Odd Tullberg (Ramboll)

Objectives

Methods, algorithms and software that support interactive visualization and exploration of simulation results to assist urban planning



VISUALISATION & AURALISATION (RA6)

RA Leads

Liane Thuvander (Chalmers) Åsa Andblad (Visual Arena)

Objectives

Develop methods and tools to integrate, model and visualise both qualitative and quantitative data in a digital twin.





VIRTUAL REALITY (VR)

- Visual
- Audio
- Haptic
- Interactivity



AUGMENTED REALITY (AR)

- Multi-stakeholder
- Collaboration
- Immersion
- Horizontal conversation





SCIENTIFIC VISUALIZATION

- Heat maps and clipping
- Streamlines
- Glyphs
- Isosurfaces
- Volume rendering
- Networks
- Interactivity



INTERVIEW FROM THESIS STUDENTS ABOUT DIGITAL TWIN CITY CENTER

- DO YOU THINK A DIGITAL TWIN CAN HELP WORK TOWARDS A MORE SUSTAINABLE FUTURE? PLEASE ELABORATE
- WHAT ARE YOUR BIGGEST CONCERNS ABOUT A DIGITAL TWIN FOR YOURMUNICIPALITY?







- MORE HOLISTIC OVERVIEW
- BETTER FOUNDATION FOR DECISION-MAKING
- BETTER VISUALISION
- KNOWLEDGE SHARING MORE EASILY (ACCESSIBLITY)





PAINS

• INTERNAL COMMUNICATION ISSUES



TIMETABLE AND MILESTONES

THE OPERATION OF DTCC WILL BE DIVIDED INTO 3 STAGES:

- 1. Formation, planning and recruitment (month 0-6)
- 2. Project establishment, preparation and initial implementation (month 6-18)
- 3. Project implementation, dissemination and reporting (month 18-60)

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VISION

The vision of the centre is to be a leader in establishing the Digital Twin Cities concept for digital planning, design, construction and management of sustainable, intelligent and inclusive cities.