BDTIC
2ND BUILDING DIGITAL TWIN International Congress

ASHVIN – Real-Time Digital Twin

Rahul Tomar
rahul.tomar@digitaltwin.technology
DigitalTwin Technology GmbH

www.ashvin.eu

ORGANIZED BY:

BUILDING DIGITAL TWIN ASSOCIATION

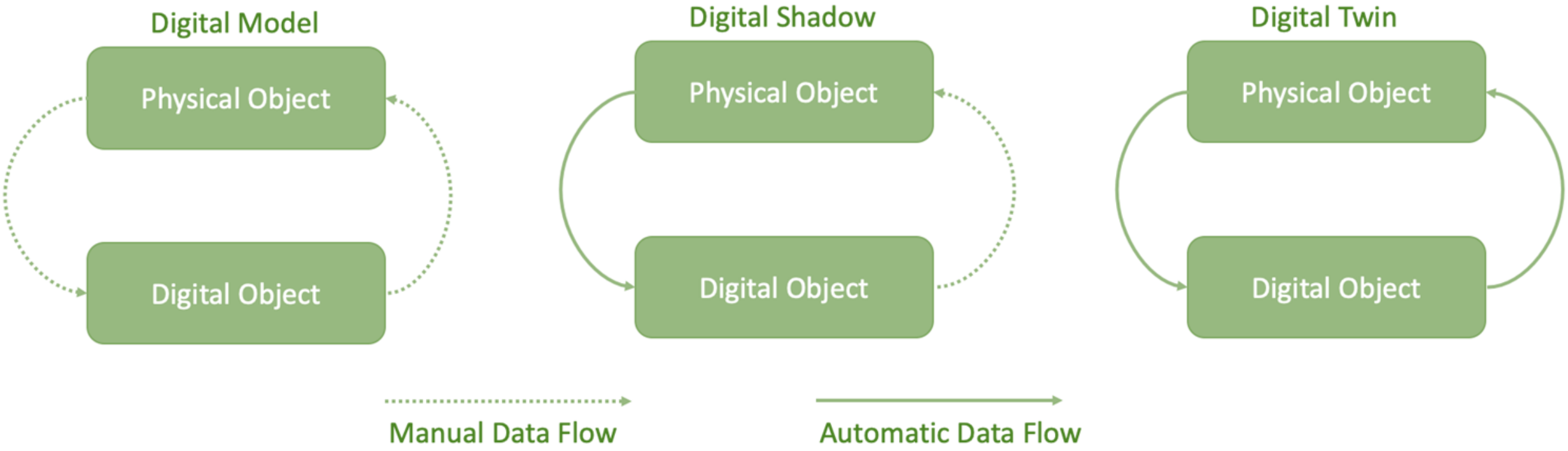
SPHERE

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S H2020 PROGRAMME UNDER GRANT AGREEMENT NO. 820805.

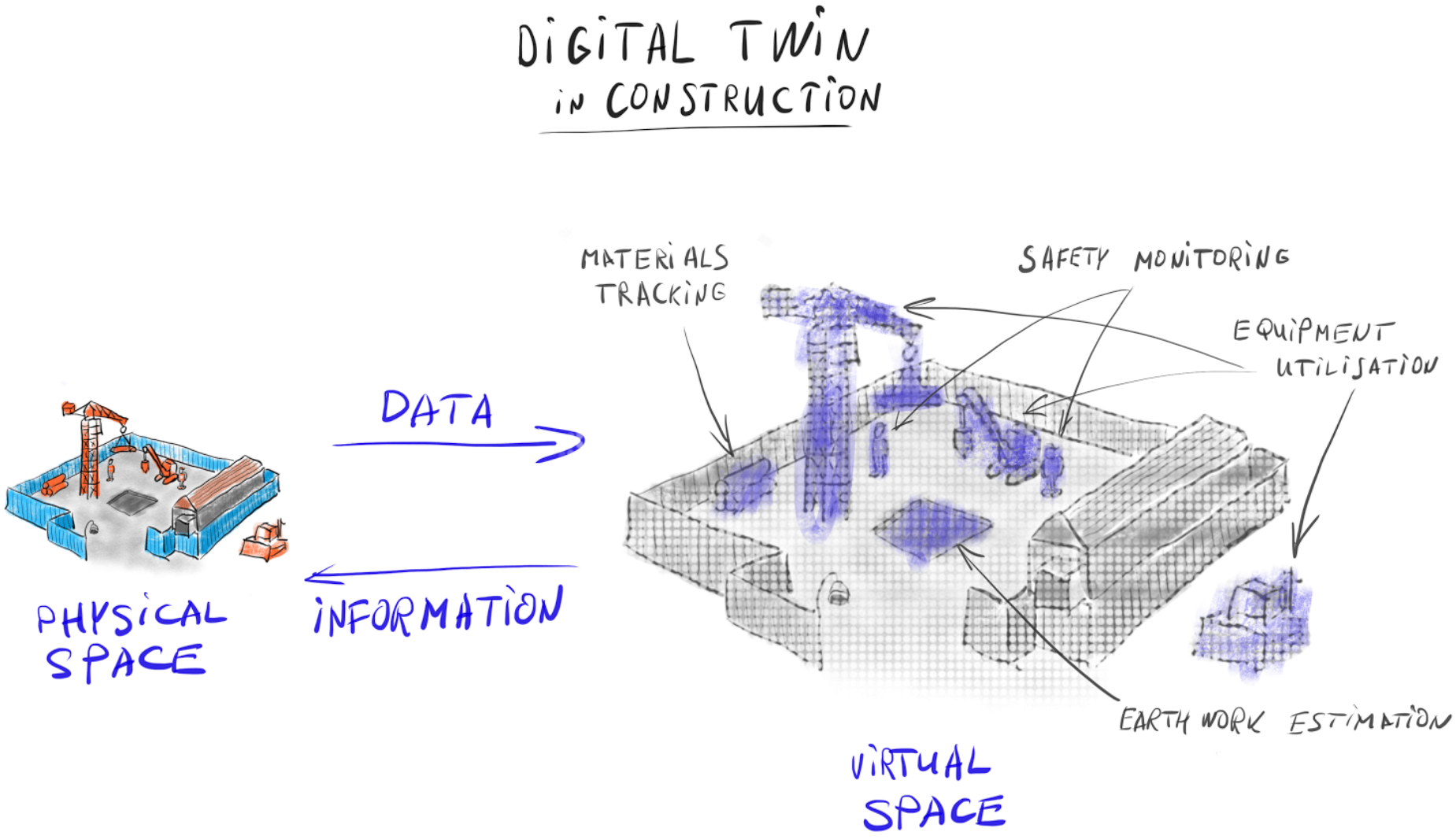
ASHVIN – H2020 Project

Ashvin portrayed as guardian deities that safeguard and rescue people by aiding them in various situations.

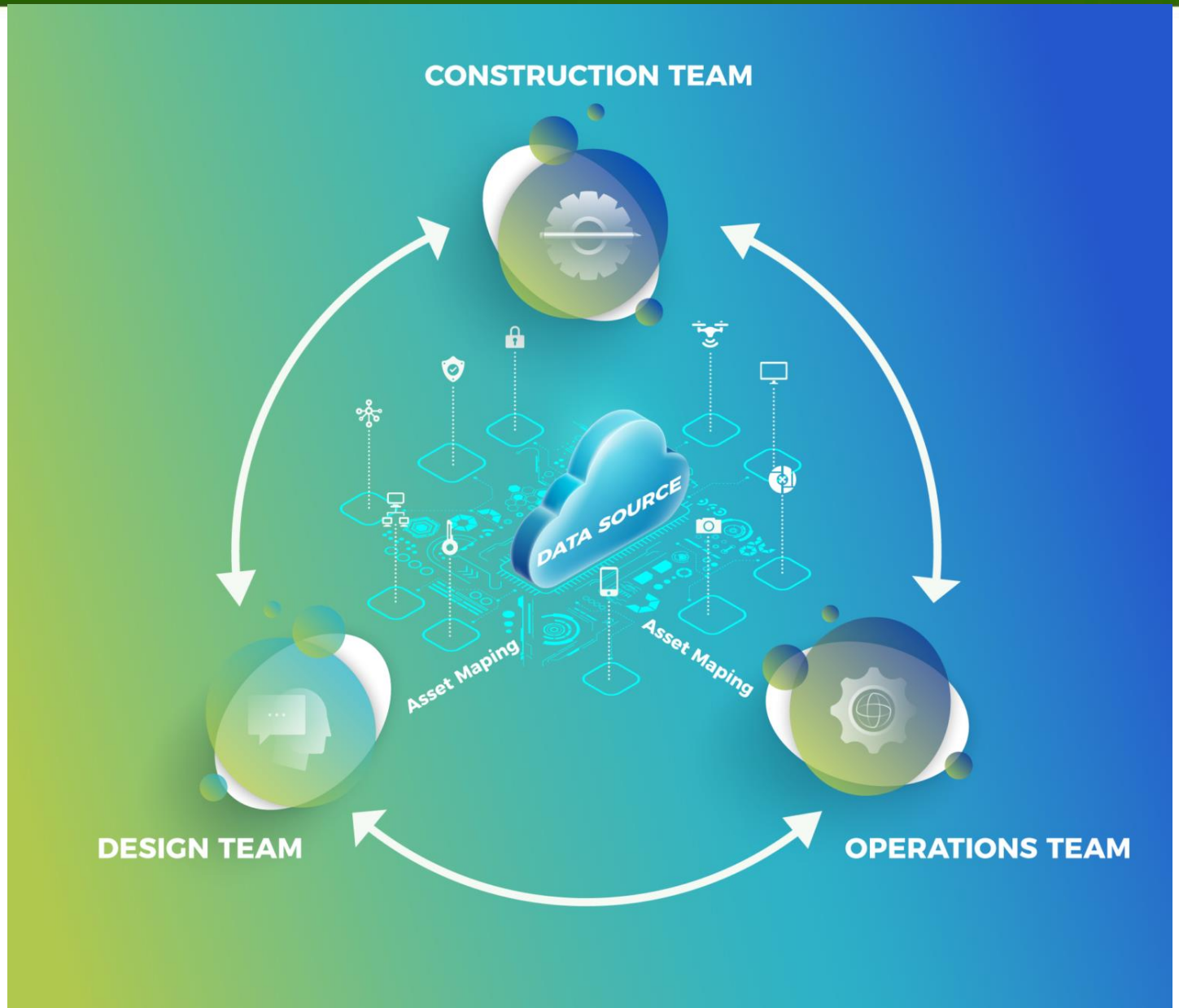
Digital Twin Definition



ASHVIN Objective



ASHVIN– Approach



ASHVIN – Digital Twin Tool Kit

#BDTIC

SMT

Privacy ensuring safety management, simulation, and training tool

RISA

Risk-based status assessment tool with KPI dashboard

MATCHFEM

Multi-physics model matching tool for status assessment of bridges and buildings

GISI

GIS integrator for digital twin-based asset management

GEN

Generative design modeller to support design for productivity, resource efficiency and safety

DES

Simulation-based real-time construction site and logistics planning tool

A configuration management tool to track as-designed and as-built, as well as, to allow for seamless commissioning

CMT

Evidence based design support tool for productivity resource efficiency and safety

BRICS

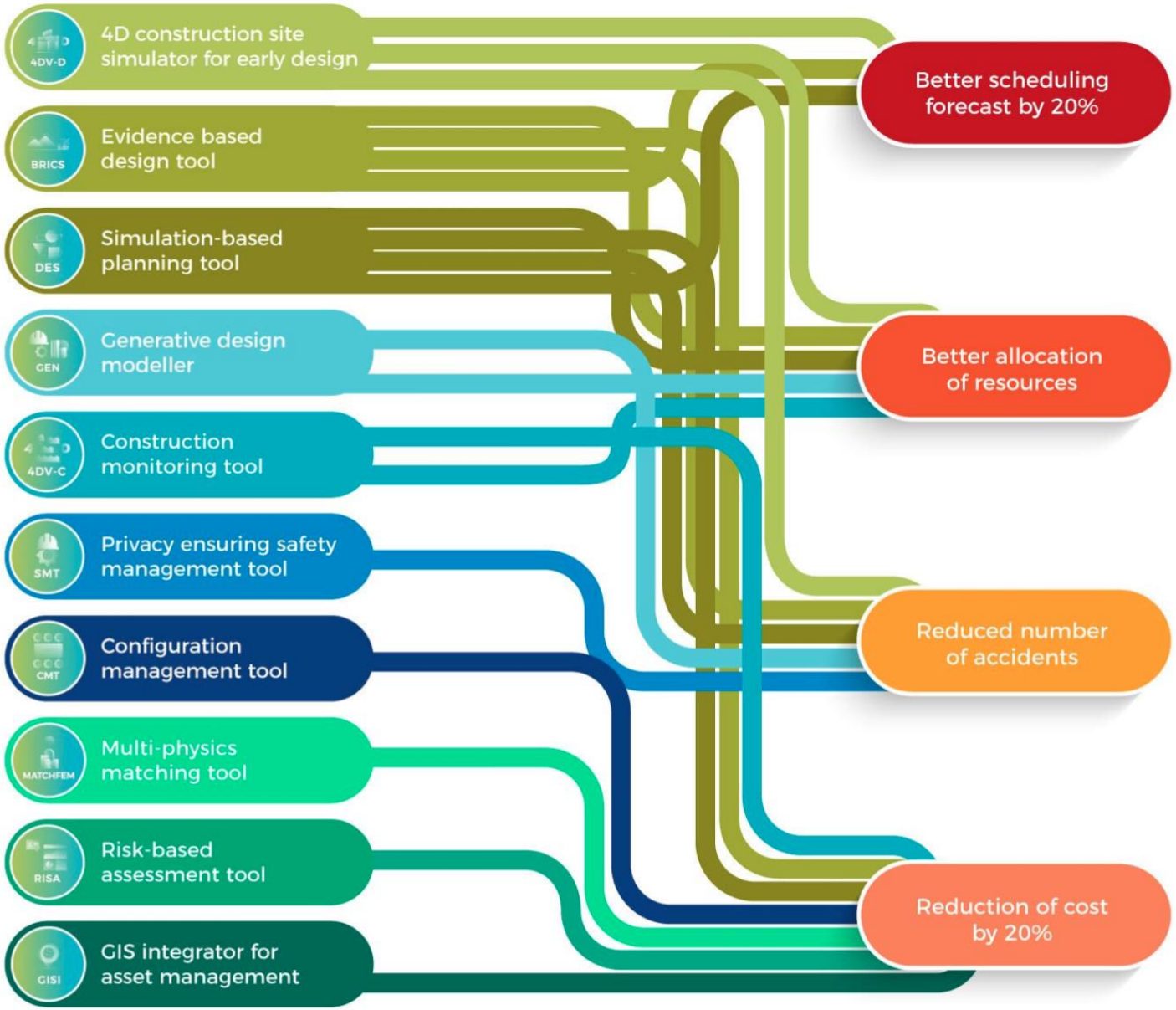
Construction site simulator for early design phases with 4D visualizer

4DV-D

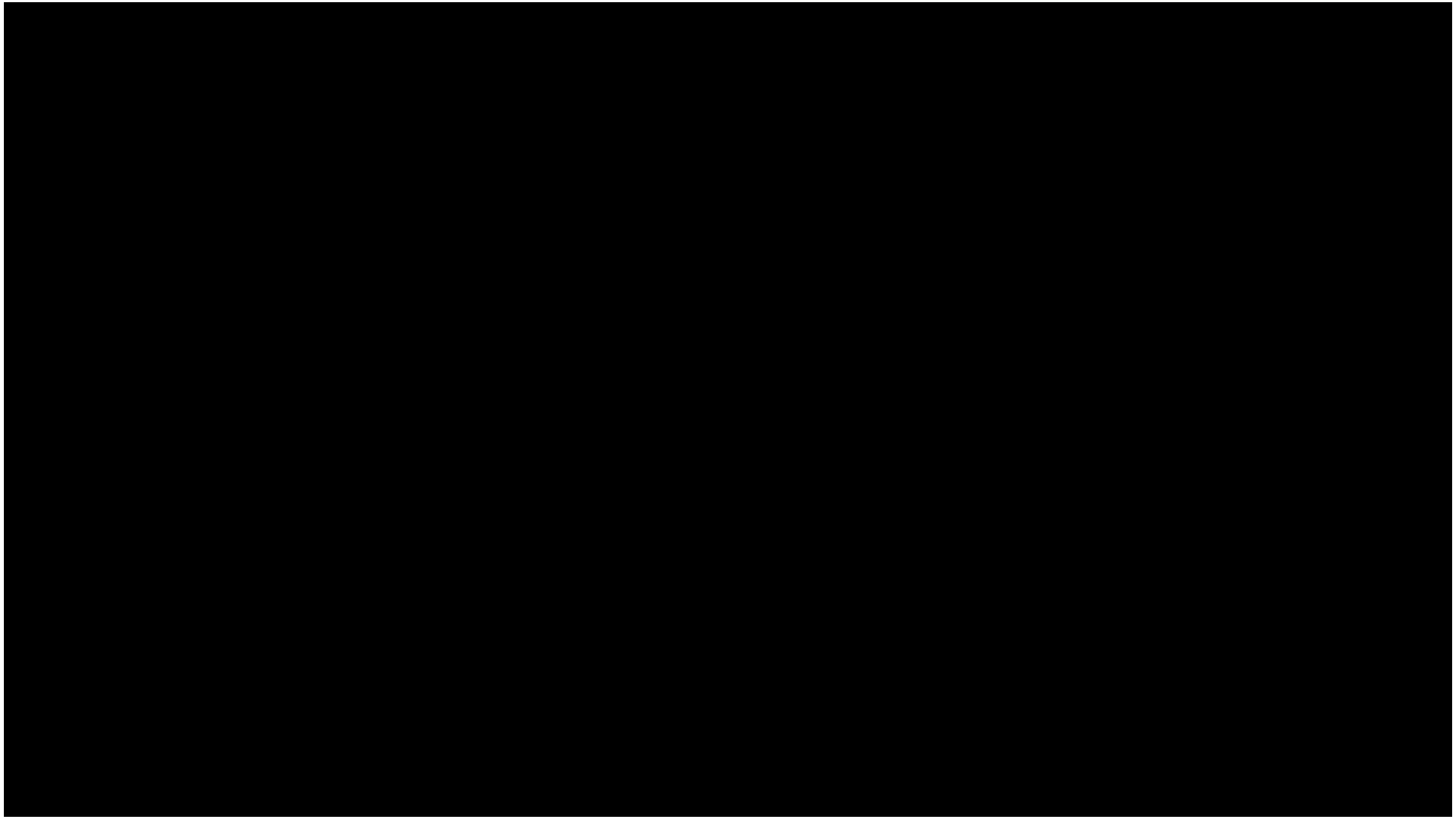
Construction monitoring tool with productivity and safety KPI decision making dashboard

4DV-C

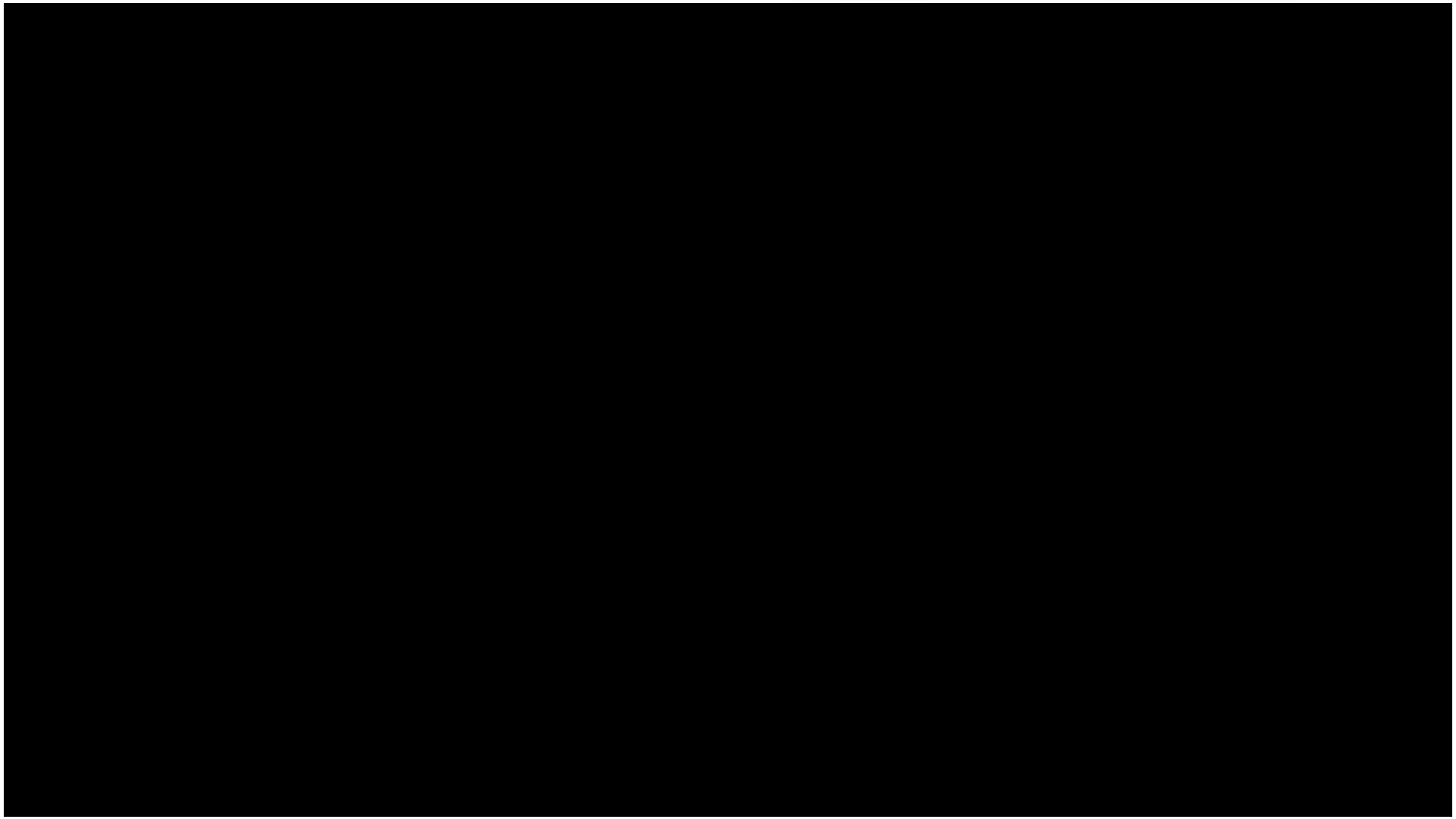
ASHVIN Tools & Expected Outcomes



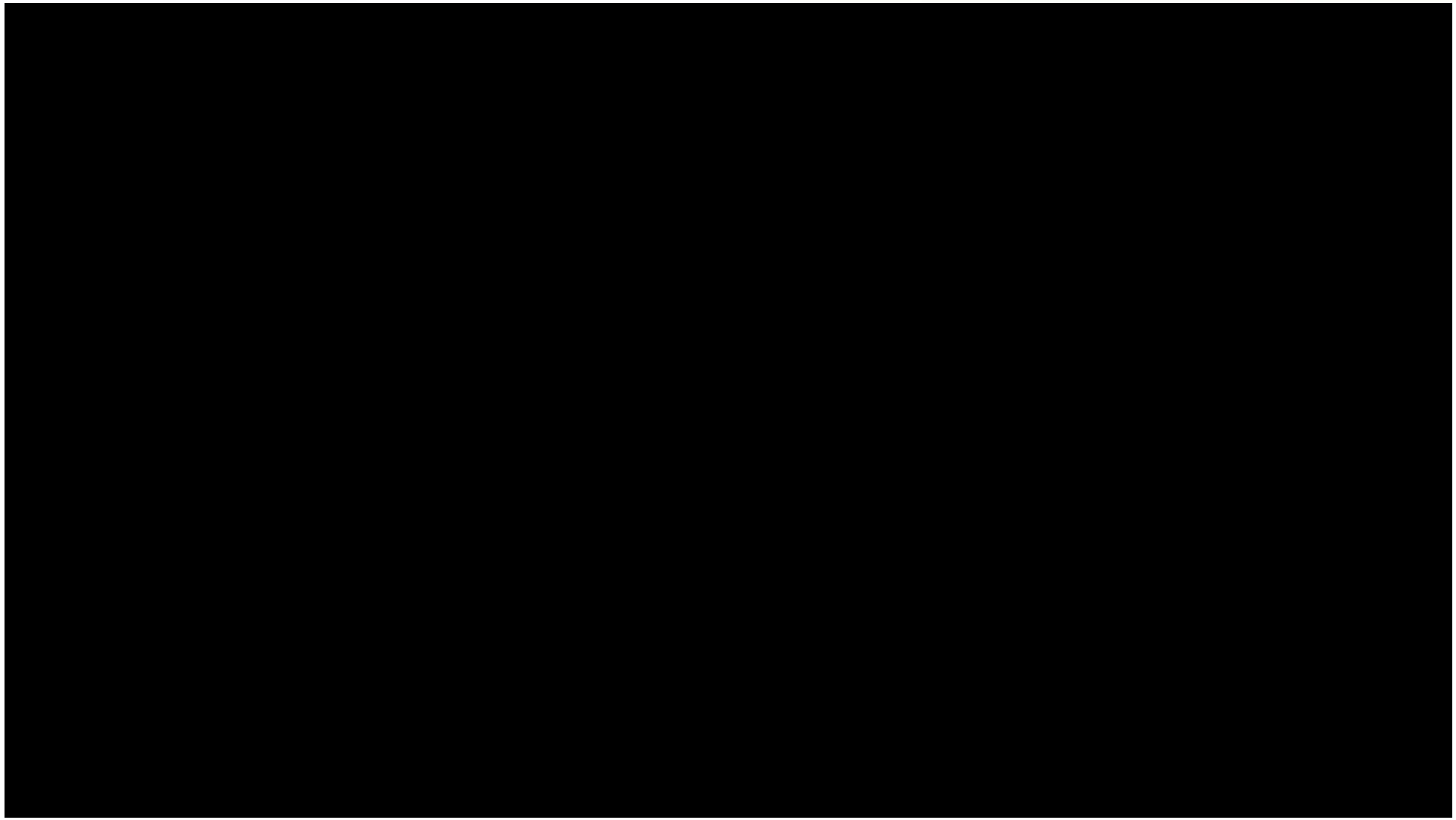
ASHVIN – Project Achievements



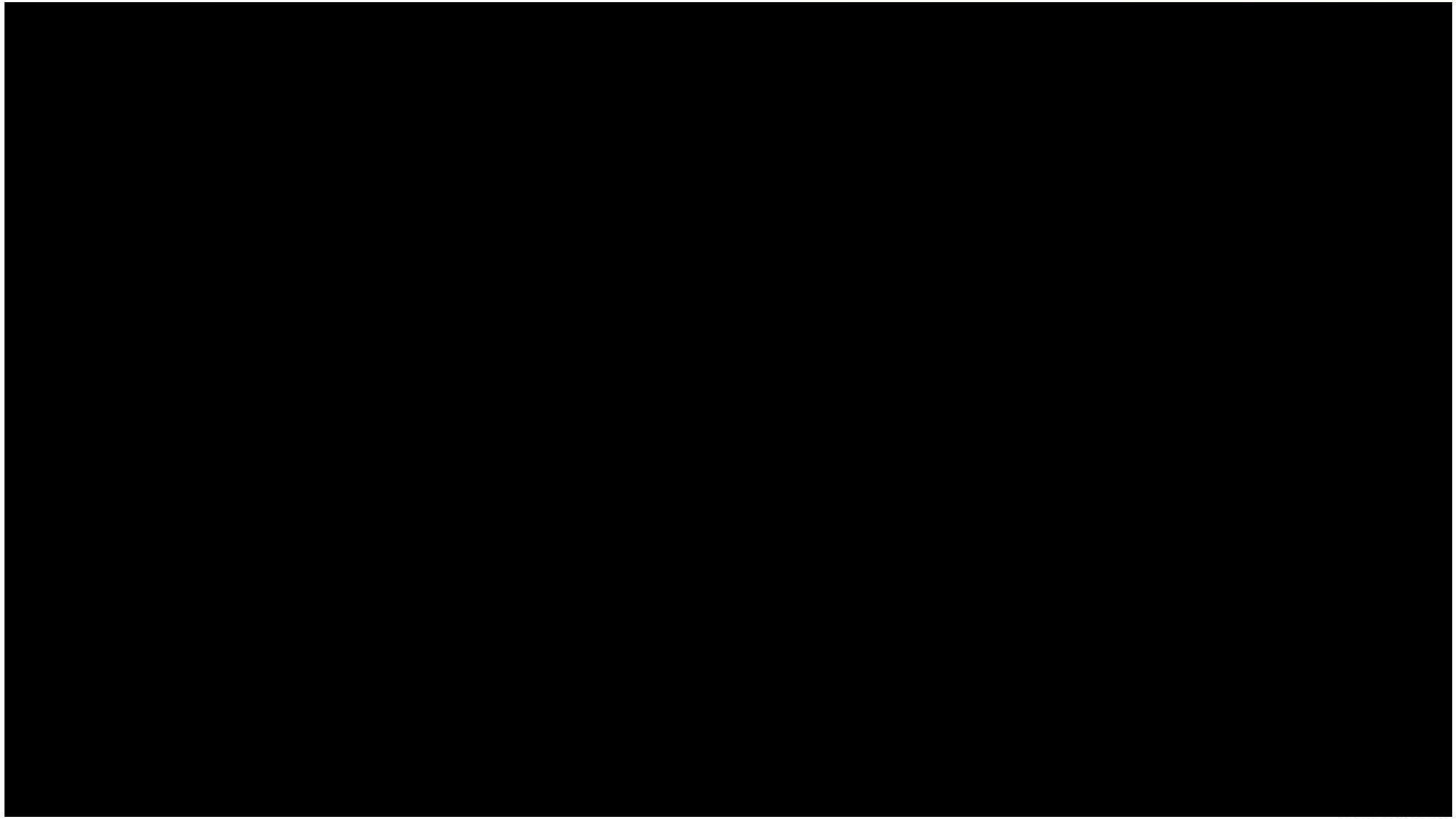
ASHVIN – Project Achievements



ASHVIN – Project Achievements



ASHVIN – Project Achievements



ASHVIN – Project Achievements

ASHVIN – Project Achievements

ASHVIN TOOLKIT

DESIGN AND ENGINEERING APPLICATIONS

Parametric Modeling Software	Statistical Programming Environment	Simulation Platform	Building Energy Simulation	Multi-physics Modeller	Open-source GIS Software Application
Autodesk Dynamo	R	AnyLogic	Energy Plus	FEM	QGIS Software

3D BIM Models

3D Models of Buildings and Structures

Game Engine-based Digital Twin Platform

3D Visualisation and Modeling

DIGITAL TWIN

IoT Platform

Data Fusion | Video, Images & Data Processing Algorithms | Machine Learning | Advanced Simulation

IOT DATA & DEVICE MANAGEMENT

MAINFLUX

Platform Administration UI

Core Services

Connectivity | Data management | Device management

Storage

CassandraDB | MongoDB | InfluxDB | PostgreSQL

Digital Twin

Security

Mutual TLS Authentication with X.509 Certificates

3D Models

3D models of the environment, soil weather, climate traffic transportation

EDGE COMPUTING DEVICES

EDGE COMPUTING AND DATA FILTERING

Edge computing gateways, LoRa gateways Microntrolers

SENSORS & MONITORING DEVICES

DATA ACQUISITION AND TRANSITION

Sensors, LIDAR, Photogrammetric & Thermal scanners, Drone & Robot cameras

ASHVIN – Value Proposition

The four value propositions

Enviromental impact and sustainability

- Contribute to achieve carbon reduction targets and net zero energy
- Integrate energy management with utilities and other renewable resources
- Holistic approach to performance-based solutions
- "Erase" human footprint (carbon negative, etc.)

Building maintenance and operations

- Data driven decision making
- Perform real time fault detection and diagnosis
- Identify resource waste
- Predict future state behavior
- Continuous optimization cycles
- Iterative operational efficiencies

People improvements and real estate interface

- Improve occupant experience and real estate interface
- Support stratgeic decision making based on human computer integration (HCI)
- Provide greater employee retention
- Create safer, more secure environments

Health and wellness

- Create healthy workplace for employees and promote collabration
- Promote employee engagement with the built envionment
- Comply with various building standards such as LEED, WELL, ASHRAE, ISO, etc.

BDTIC

2ND BUILDING DIGITAL TWIN International Congress

ORGANIZED BY:

BUILDING DIGITAL TWIN ASSOCIATION

SPHERE
BIM DIGITAL TWIN ENVIRONMENT

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S H2020 PROGRAMME UNDER GRANT AGREEMENT NO. 820805.