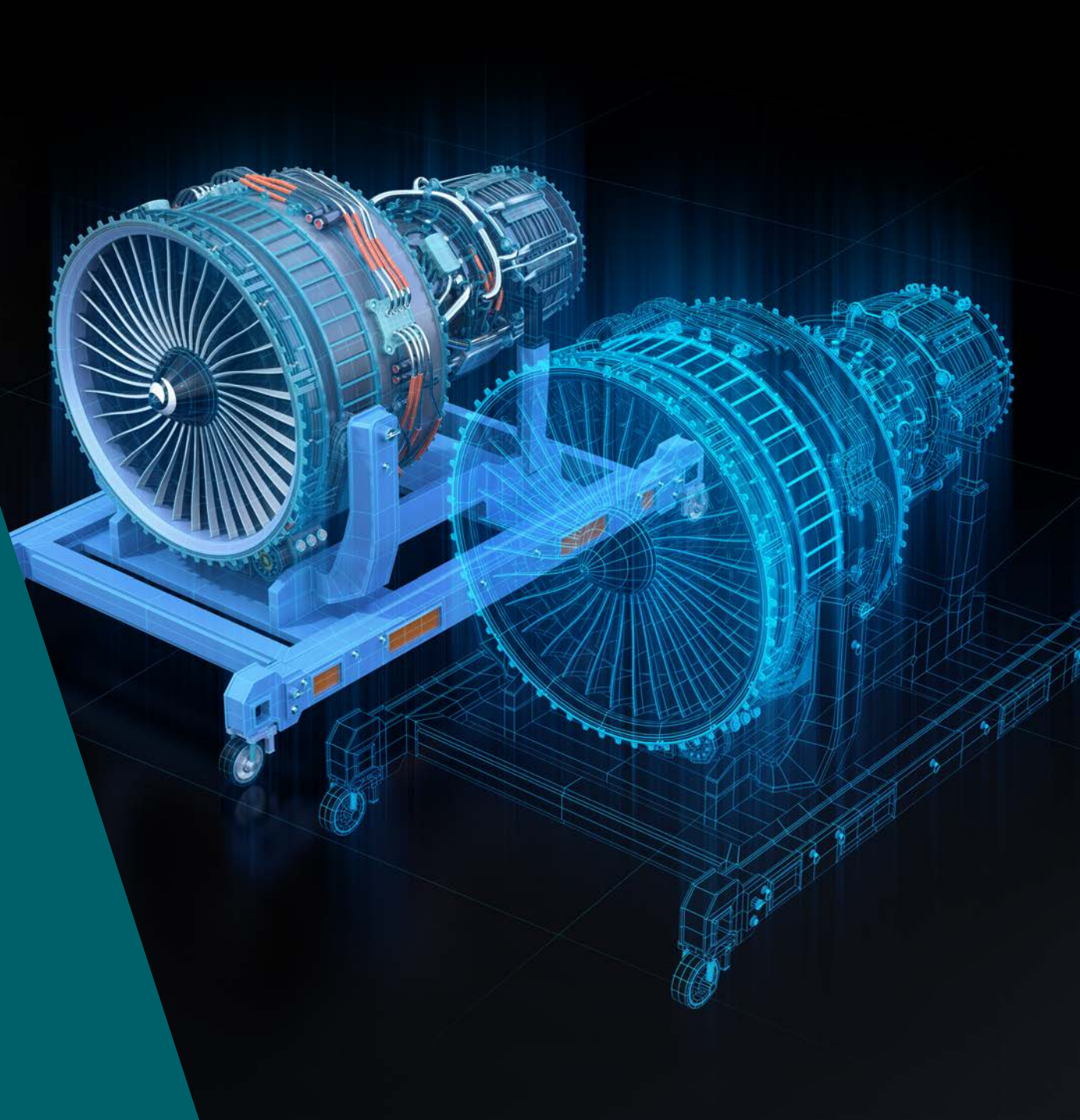
EC ITB

2019 Oil & Gas Project Management Conference



P & J Live Aberdeen

Thursday 7th November 2019

Digital Twins & digital working environments and their impact on collaborative working

Dr Marianthi Leon

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Asset and Collaboration Management

Overview

DIGITAL TWINS AND DIGITAL WORKING ENVIRONMENTS AND THEIR IMPACT ON COLLABORATIVE WORKING

01

Introduction | 4th Industrial Revolution

From fragmented workflows to information continuum.

02

Digital Twin

Assets capturing + assets monitoring + intelligent decision making = Digital Twin.

03

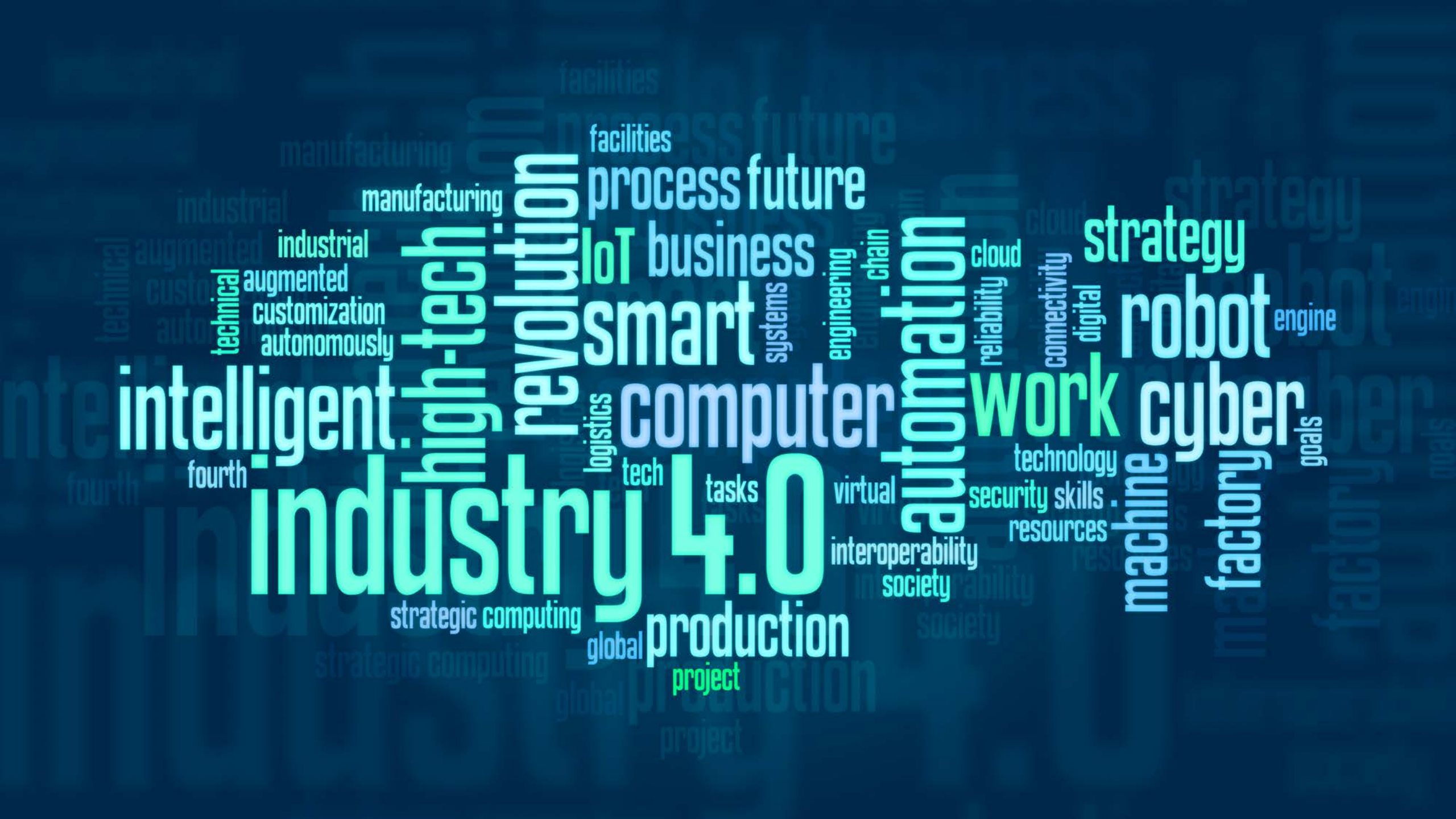
Case Studies

Manufacturing and Resource Industries knowledge transfer.

04

Innovation | Collaboration

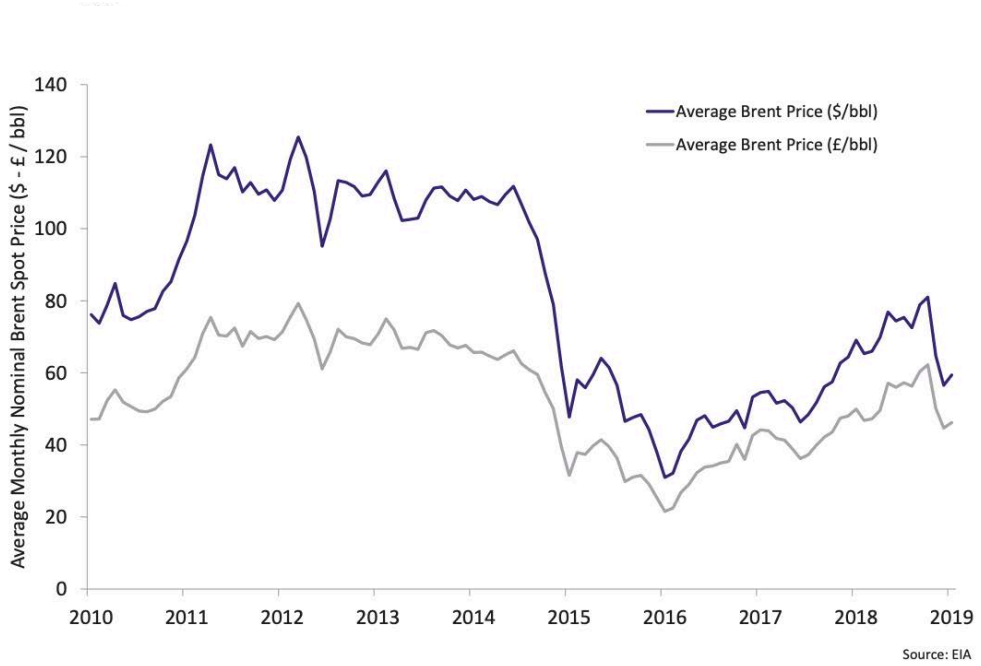
Step change for interdisciplinary team work.


industry 4.0
intelligent
high-tech
revolution
process
future
facilities
manufacturing
IoT
business
smart
computer
automation
work
cyber
robot
strategy
industrial
augmented
customization
autonomously
technical
systems
engineering
chain
cloud
reliability
connectivity
digital
engine
logistics
tech
tasks
virtual
security
skills
technology
goals
machine
factory
resources
interoperability
society
fourth
strategic computing
global
production
project

Introduction

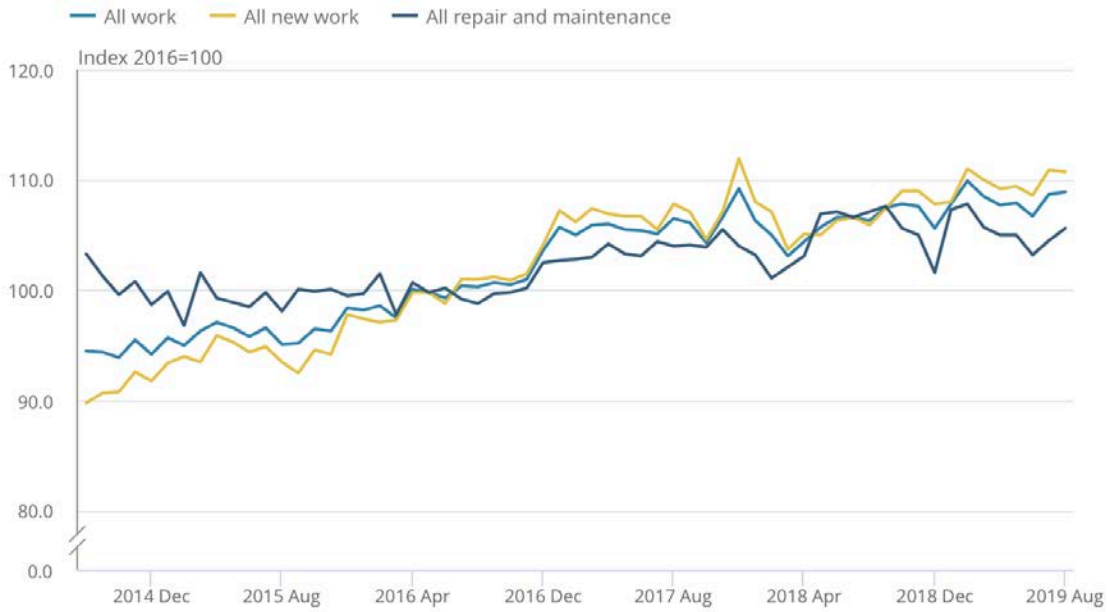
Markets Volatility

Oil & Gas industry

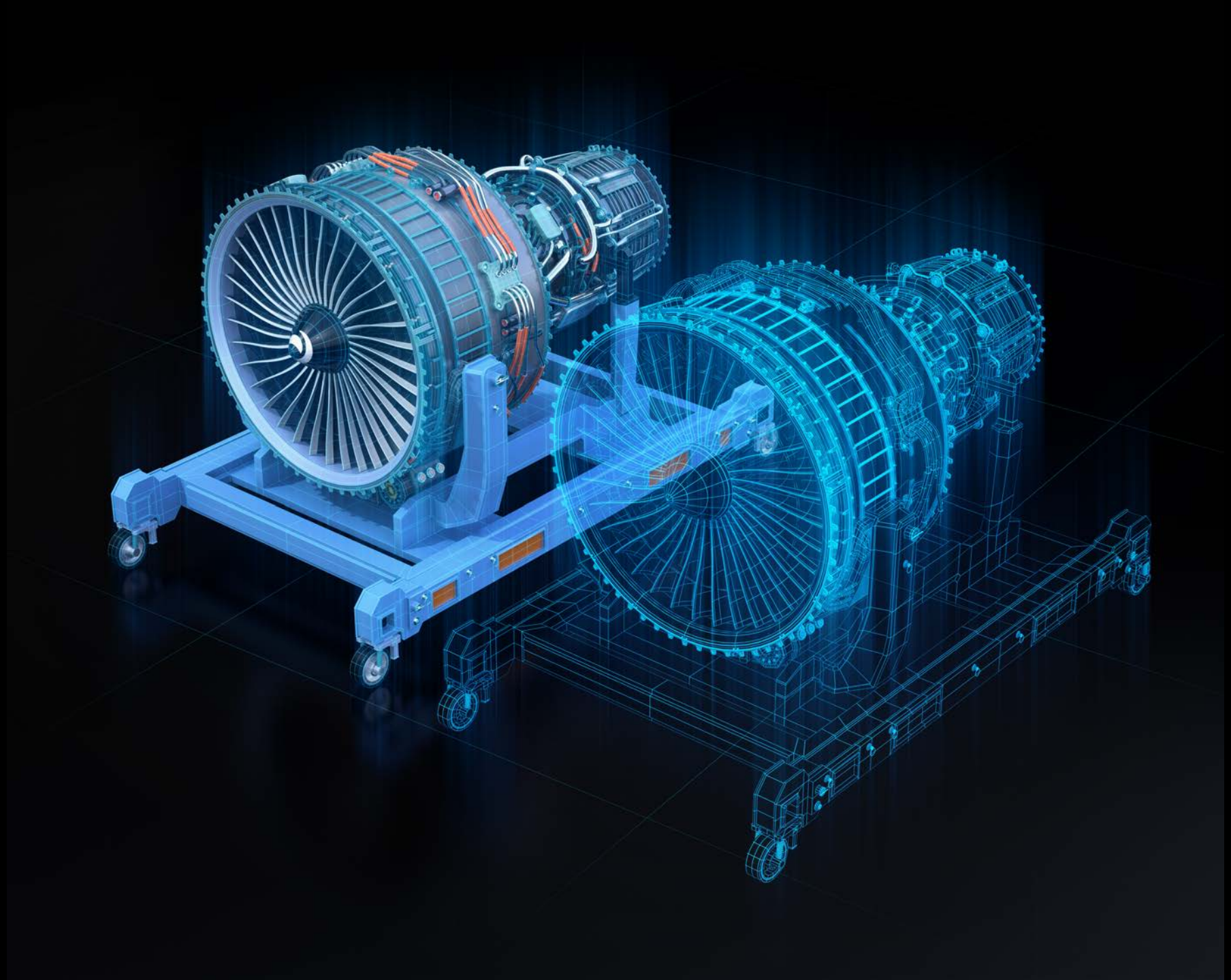


Source: Oil & Gas UK, Business Outlook Report 2019

Construction industry



Source: Construction: Output and Employment, Office for National Statistics, UK, 2019



Digital Twin

- Digital twin 1: **A dynamic model of an asset**, with input of current performance data from the physical twin via live data flows from sensors; feedback into the physical twin via real-time control.
- Digital twin 2: **A static strategic planning model of a system**, with input of long-term condition data from the physical twin via corporate systems; feedback into the physical twin via the capital investment process.

CDBB (2018) The Gemini Principles.

Digital Twin

- Information included:
  - Data
  - Model
  - Visualisations

- Purposes:

  Current state | Future scenarios | Historic asset information

- Spatial scales:

  Single asset | Network of assets | System level | National level

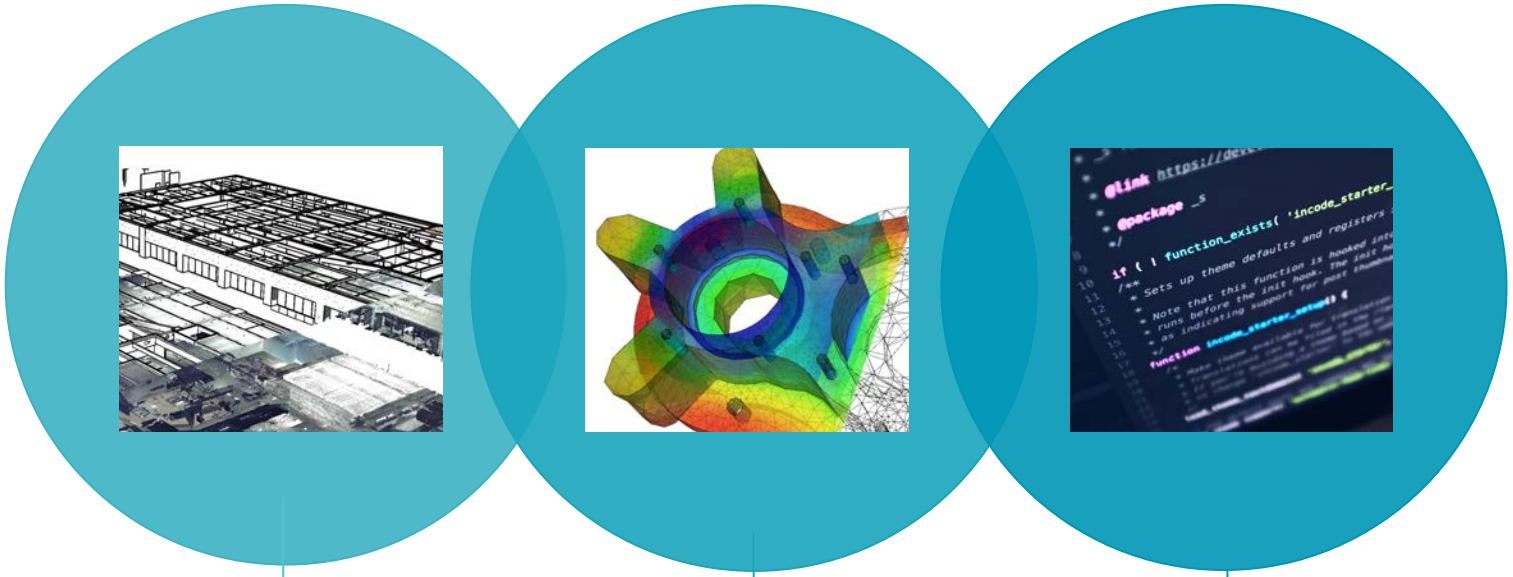
- Temporal scales:

  Lifecycle | timescale | maintenance | capital investment

CDBB (2018) The Gemini Principles.

Digital Twin

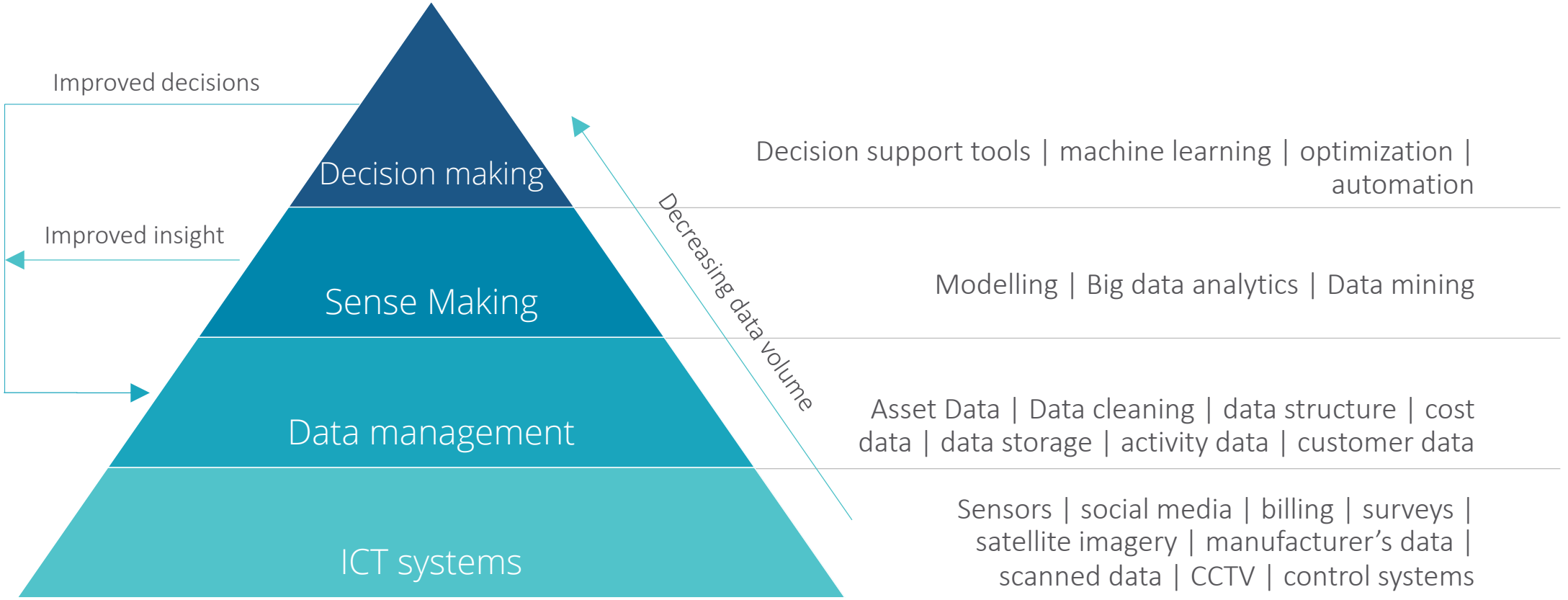
Modelling methods



- Geometric & geospatial modelling
- Computational modelling
- Artificial Intelligence and machine learning

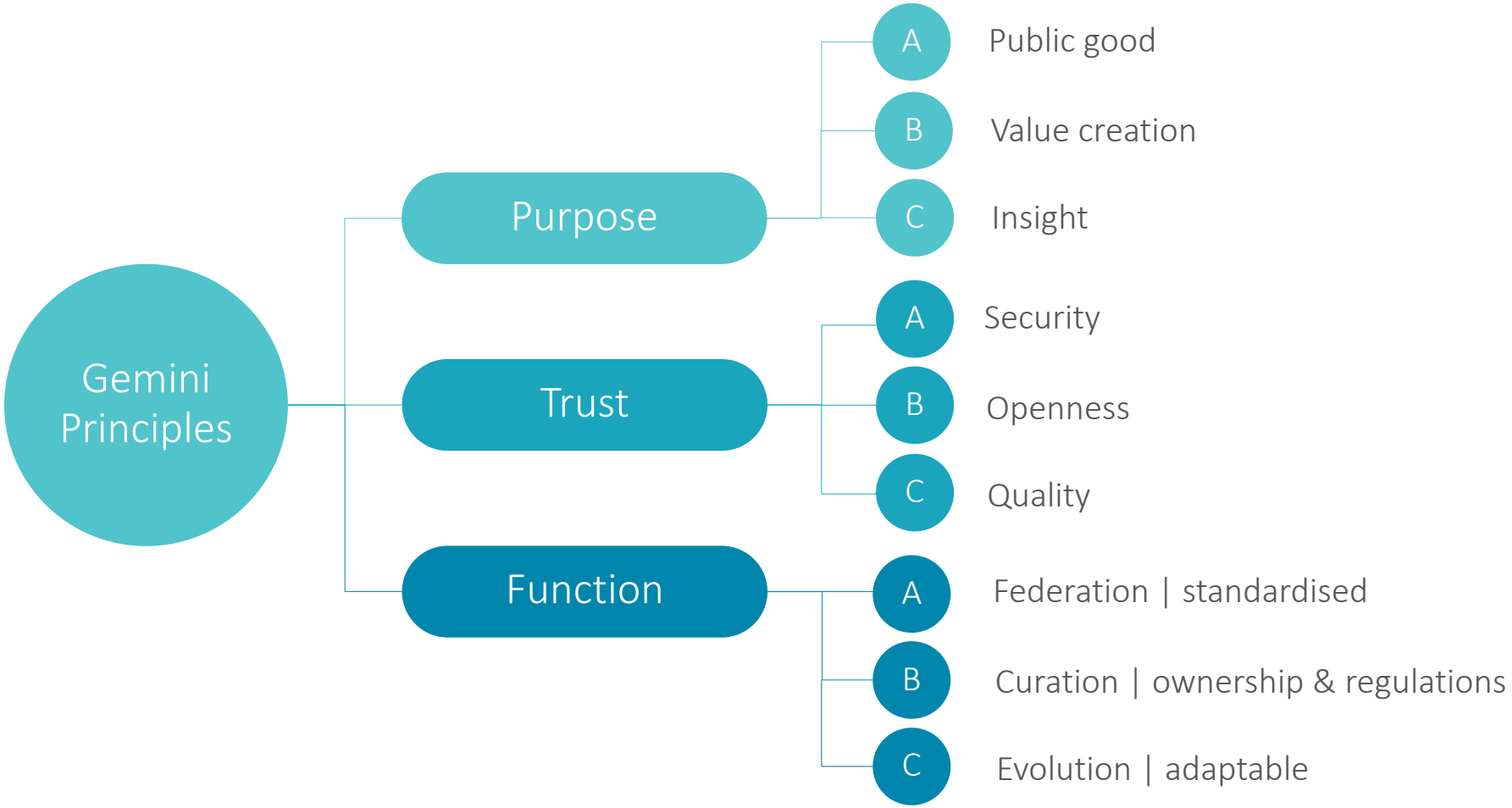
Digital Twin

Information Value Chain

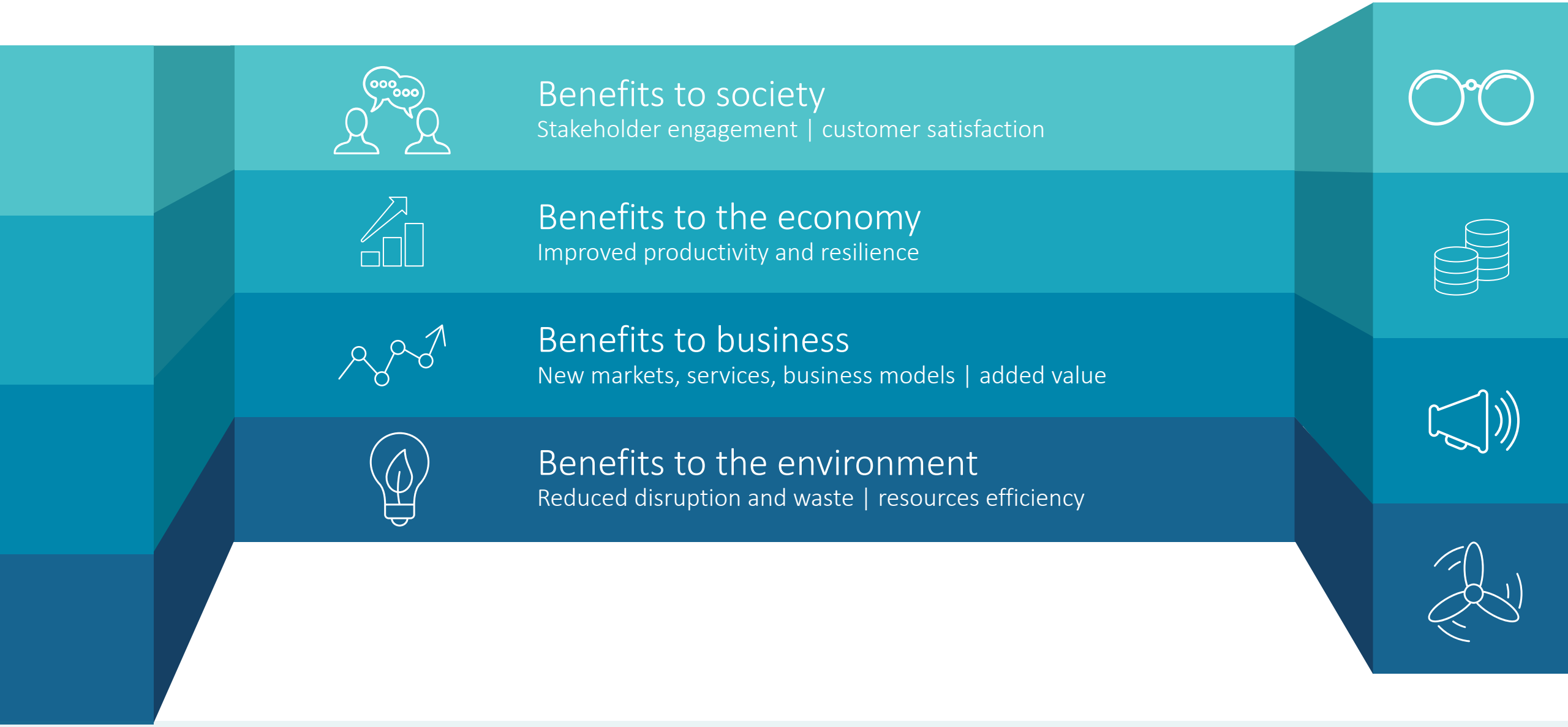


Digital Twin

Gemini Principles on Digital Twins & National Digital Twin

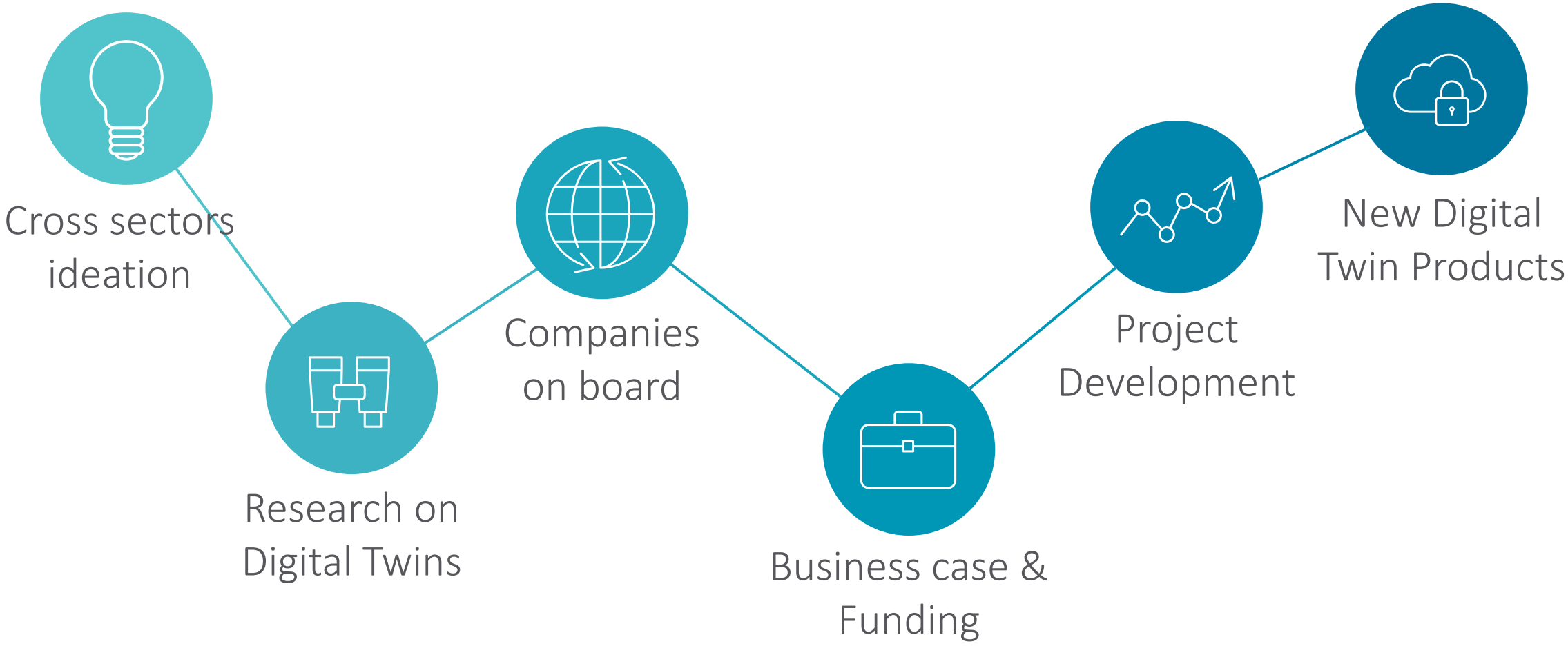


Digital Twin



Digital Twin

Case Studies

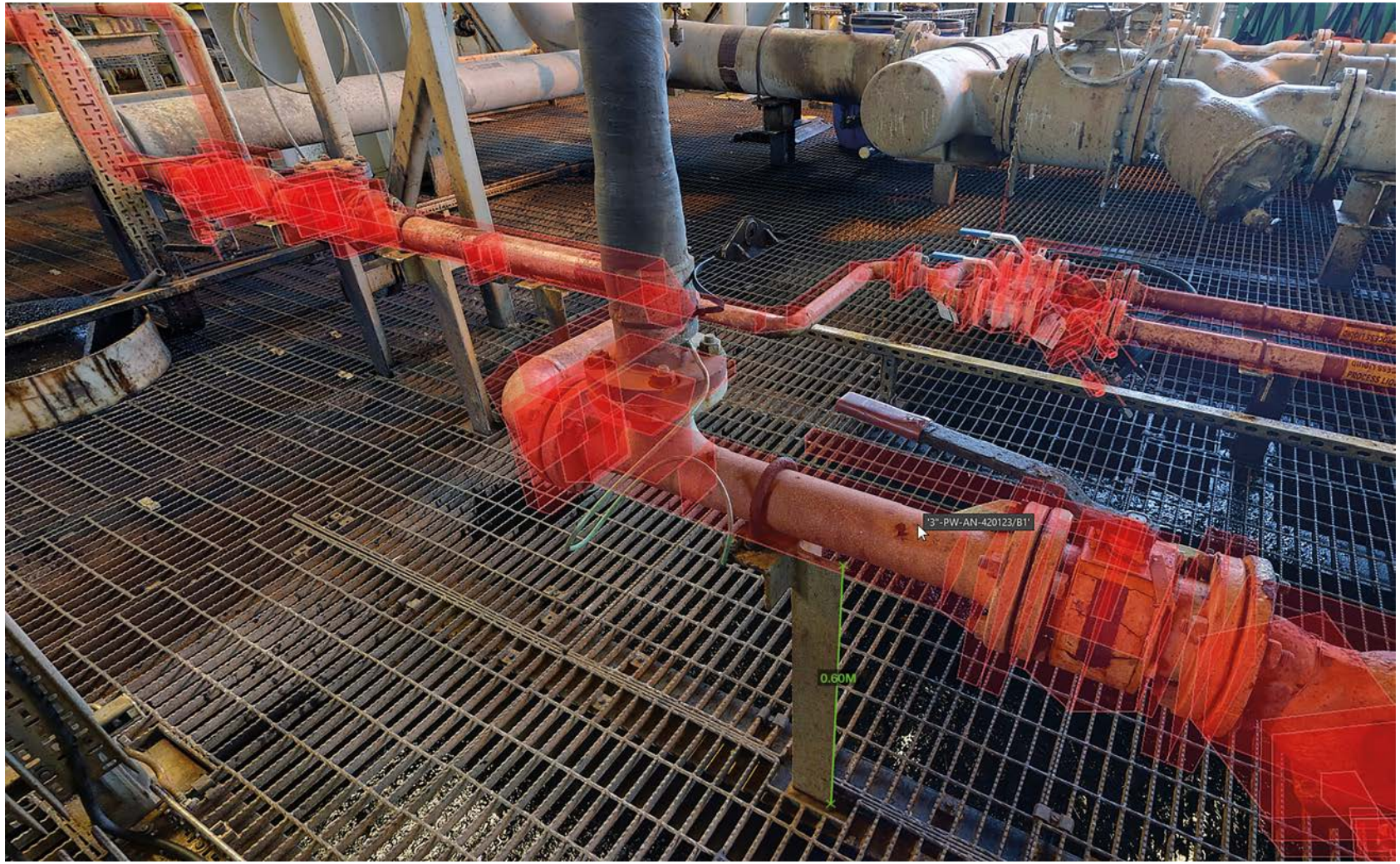


Digital Twin

Case Studies

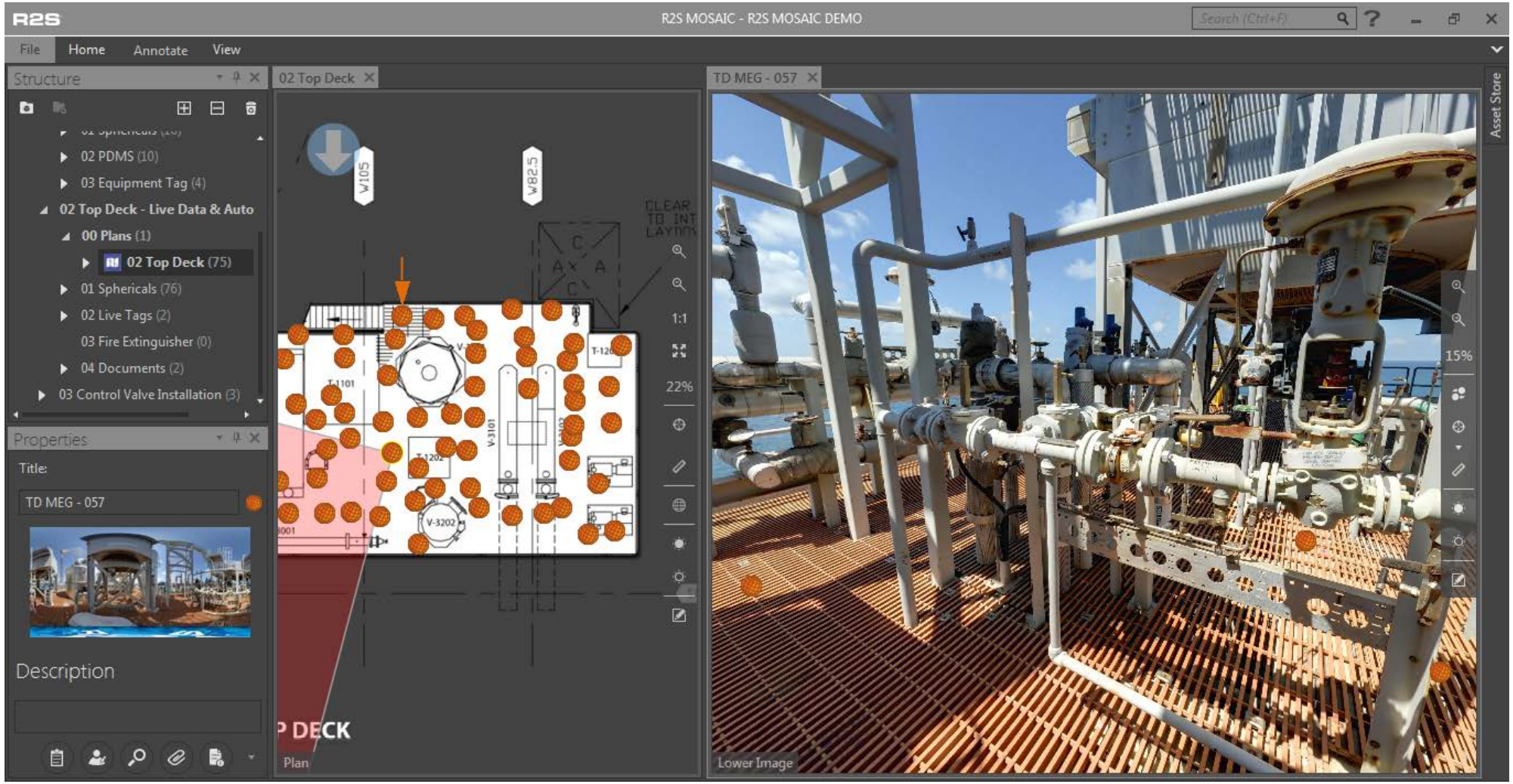
Digital Twin

Case Studies



Digital Twin

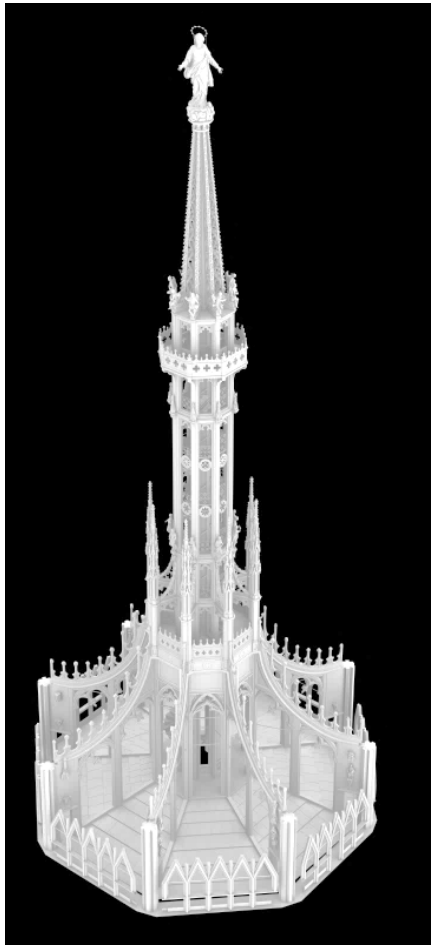
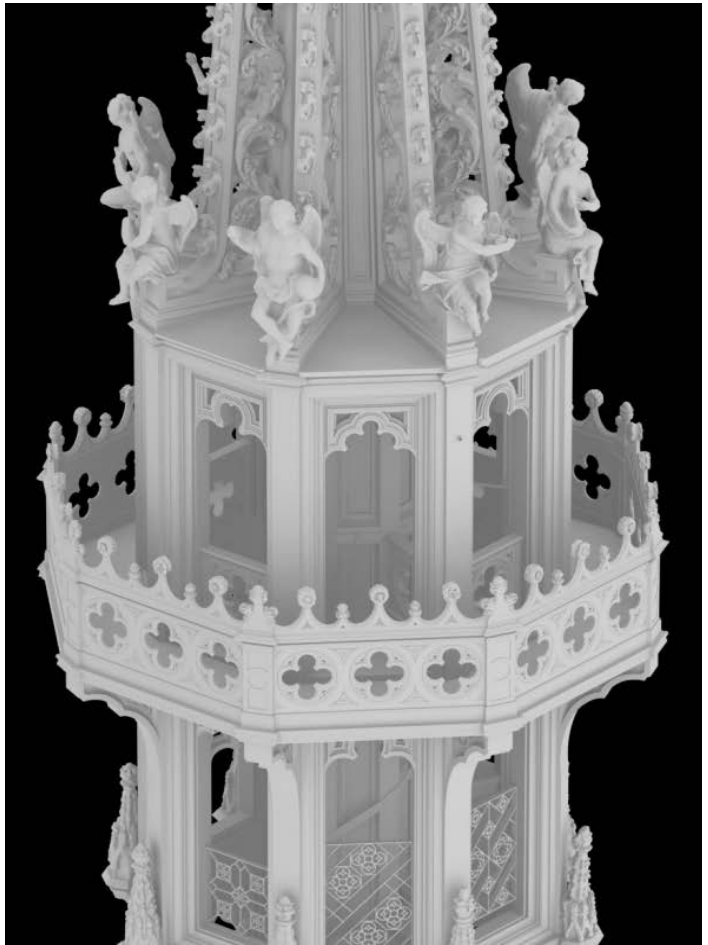
Case Studies



Digital Twin

Case Studies

POLITECNICO
MILANO 1863


Digital Twin

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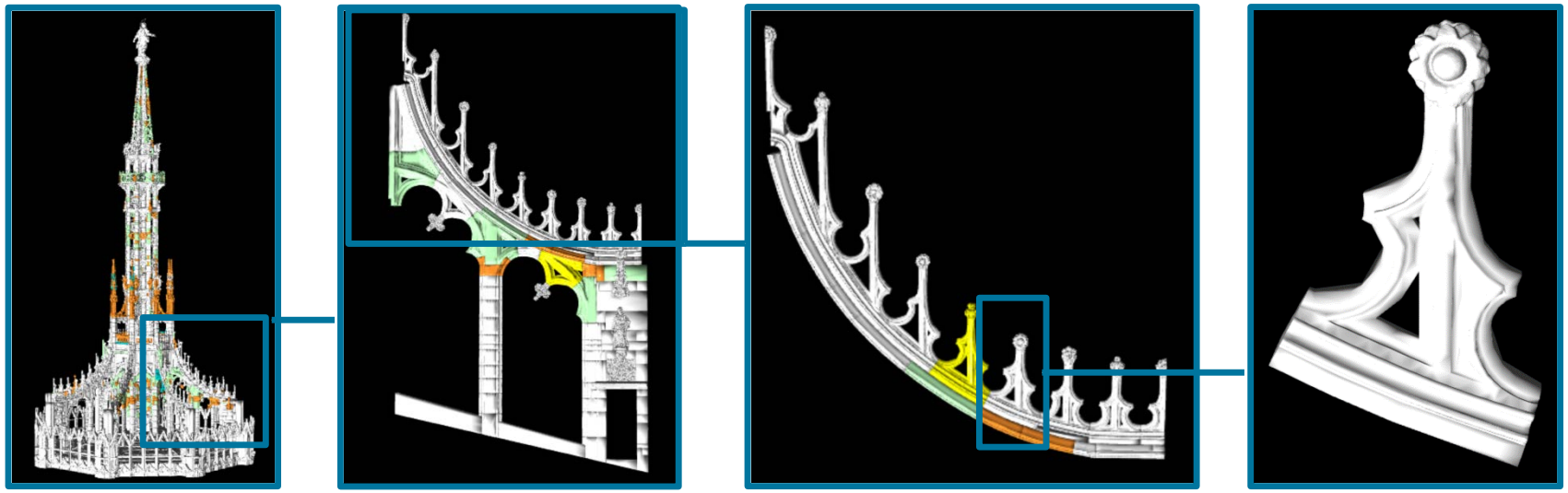

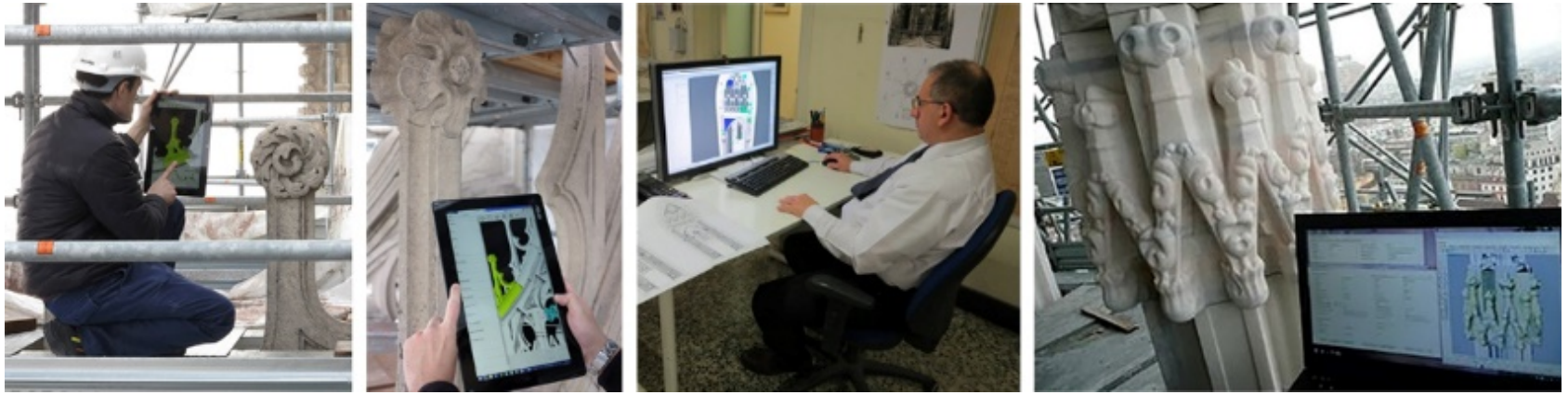

Digital Twin

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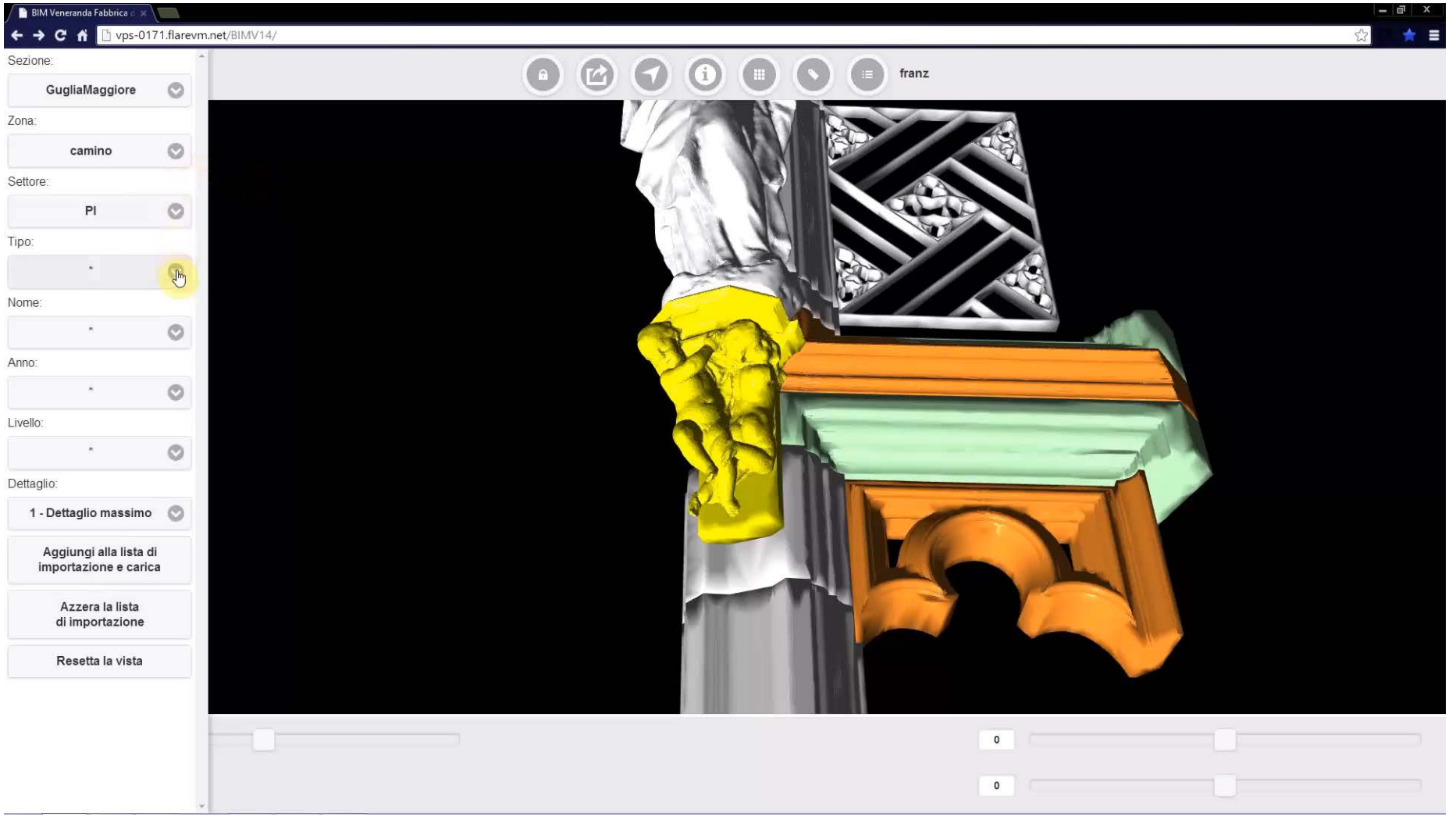

Digital Twin

Case Studies

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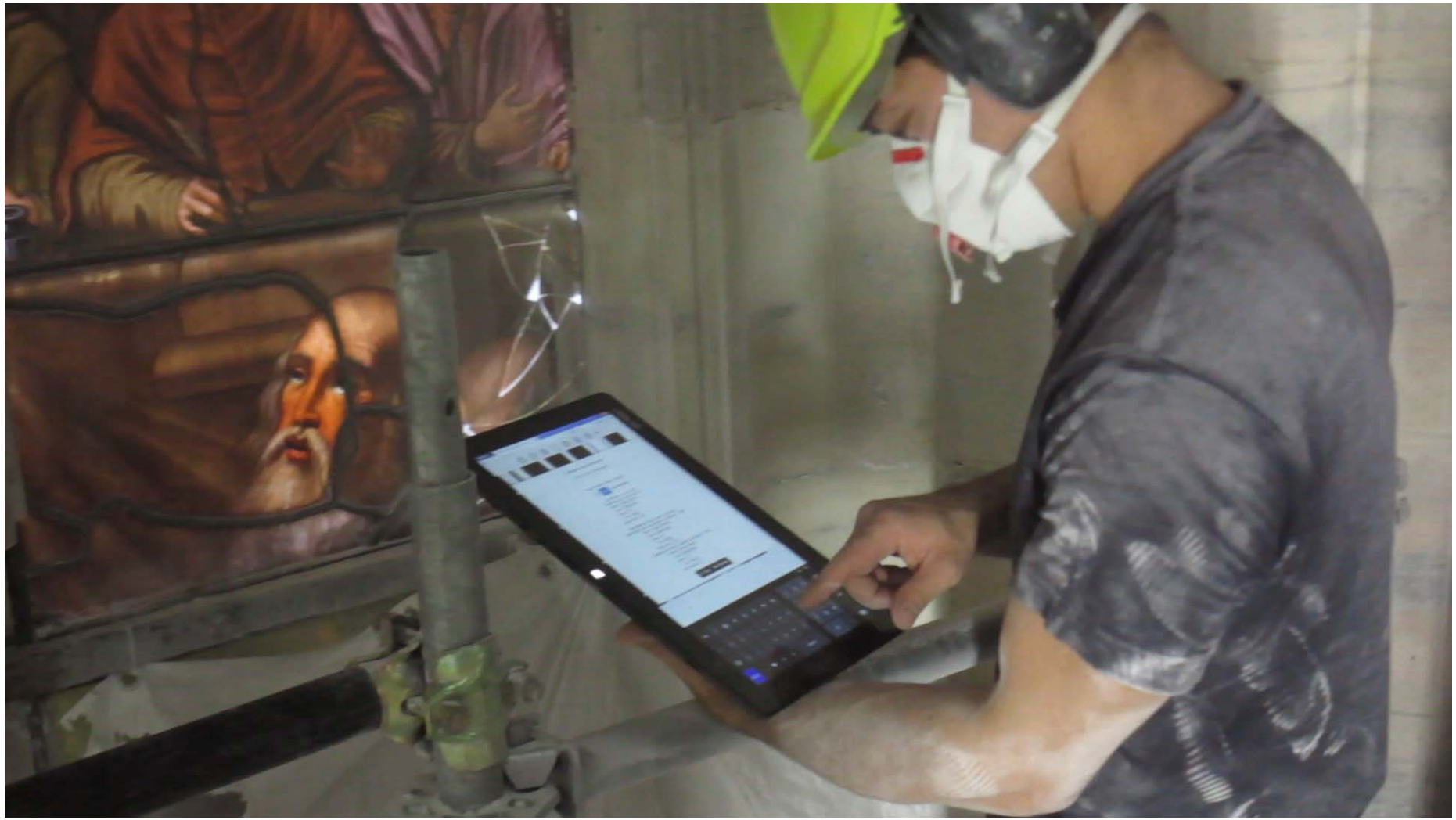
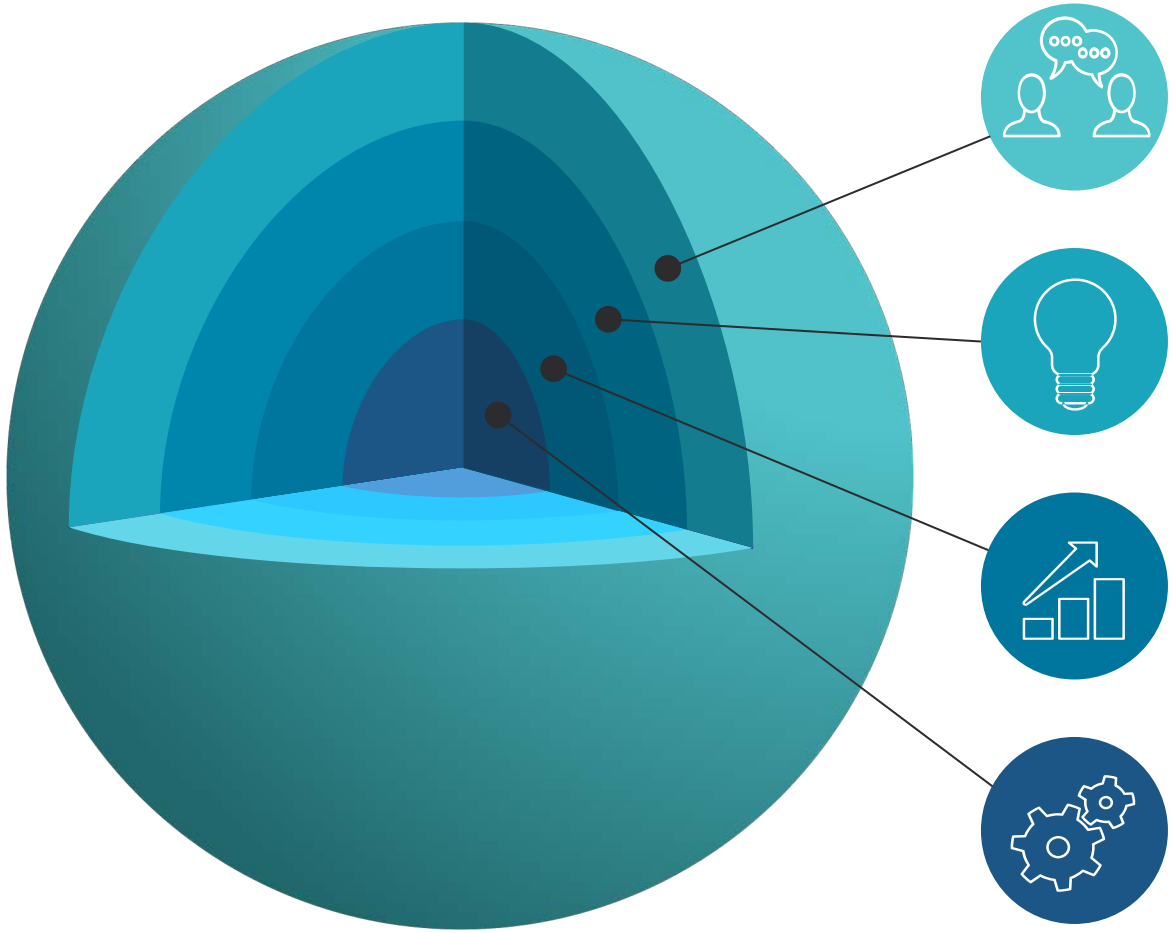


Facilitating project success & profitability



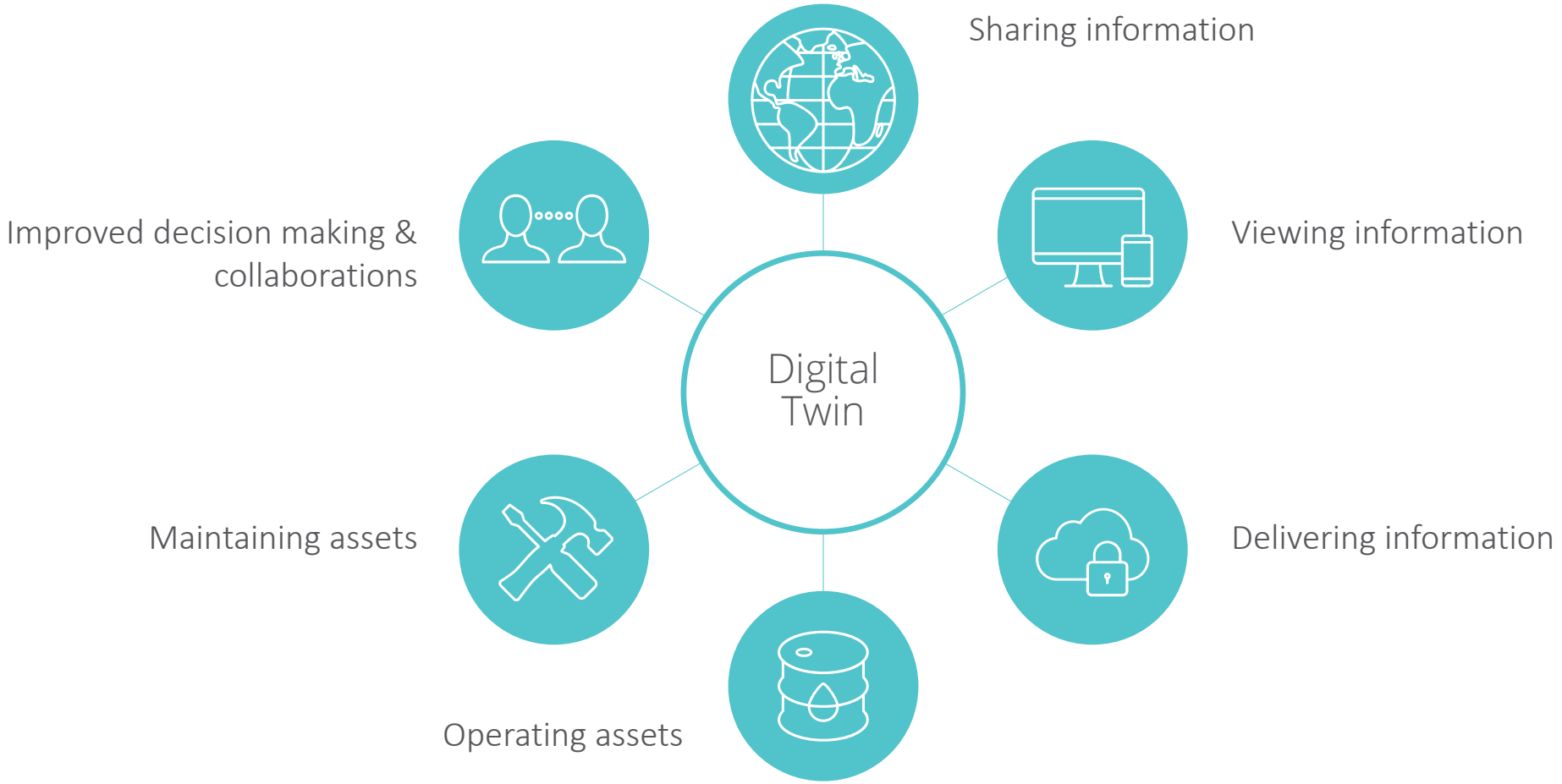
Visual Communication
Knowledge artefacts

Innovation
From shared understanding to ideation

Productivity
Information Access

Collaboration
Multidisciplinary | face to face and distant | synchronous & asynchronous | trust development

Facilitating collaborations



Facilitating collaborations

- Timely information access:

  Enhanced decision making | Sense making| Historic asset information

- De-risking unknowns:

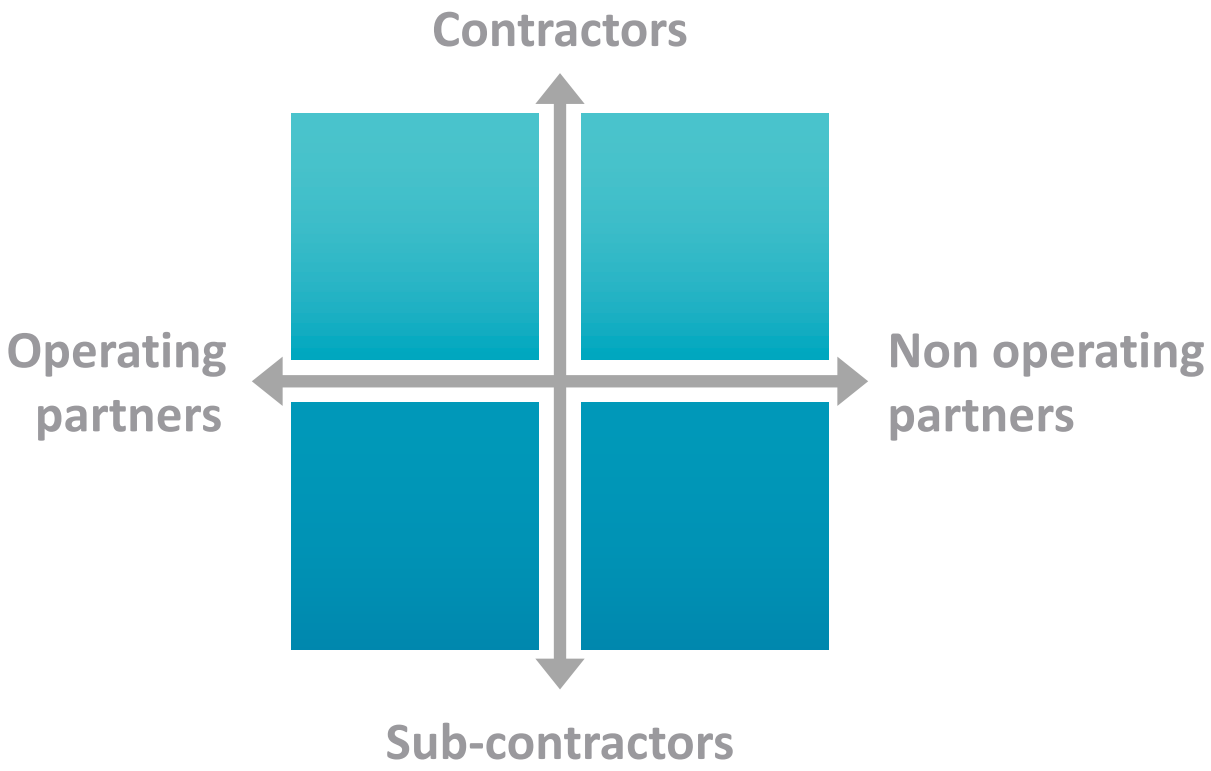
  ICT data | AI ML & simulations | improved insight

- Future proofing critical infrastructure:

  Lifecycle | timescale | maintenance | capital investment

- Innovative business models:

  Integrated project delivery | complex projects delivery



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