

XR4_manufacturing and assembly

12th December 2019, Brussels



seele

DigitalTWIN to improve future grid shell installations

12th December 2019, Brussels





hosting mobility

King's Cross Station, London/UK



King's Cross Station, London/UK



King's Cross Station, London/UK

symphony in glass and steel



Chadstone Shopping Centre, Melbourne/Australia



Chadstone Shopping Centre, Melbourne/Australia



Chadstone Shopping Centre, Melbourne/Australia

9 gridshell installation

Precise Positioning of Heavy Steel Structures on the Construction Site

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10 communication is a key


Interacting between Design and Manufacturing Teams

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123 three-dimensional
curved steel ladders



lean manufacturing

13 interface planning - assembly

Digital production control and assembly documents

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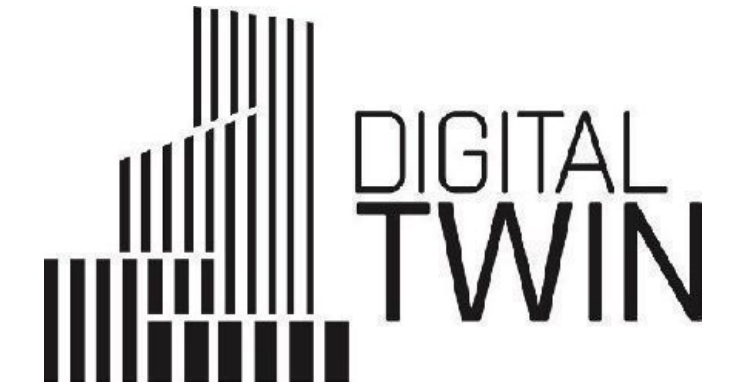


welding of load-bearing
aluminium structures



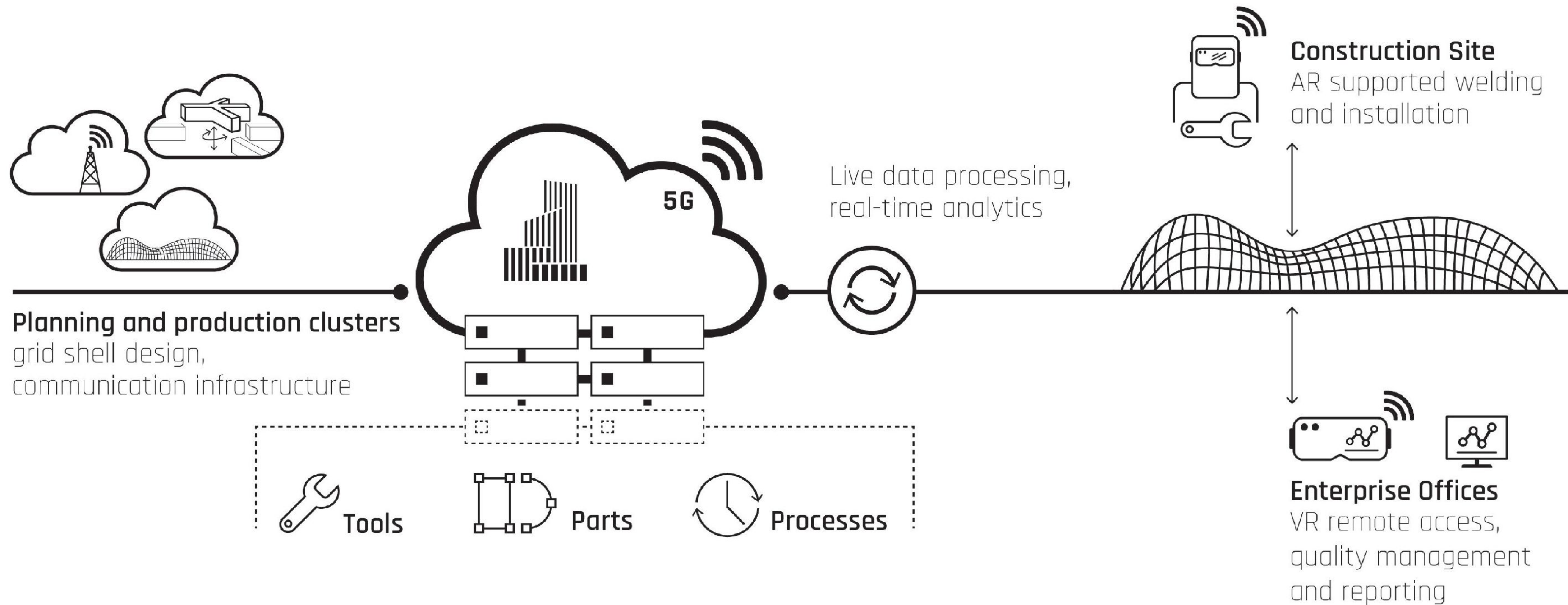
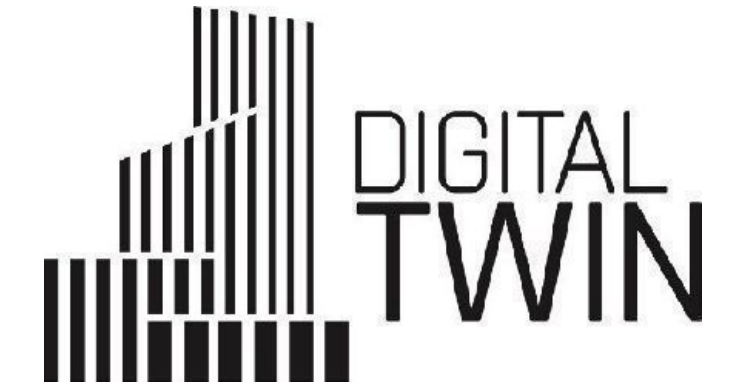
Scenarios for the future

Use Case 3: XR support for grid shell assembly



17 use case 3

Assembly Support with AR Technology Using a Gridshell Puzzle as an Example



18 digital approach

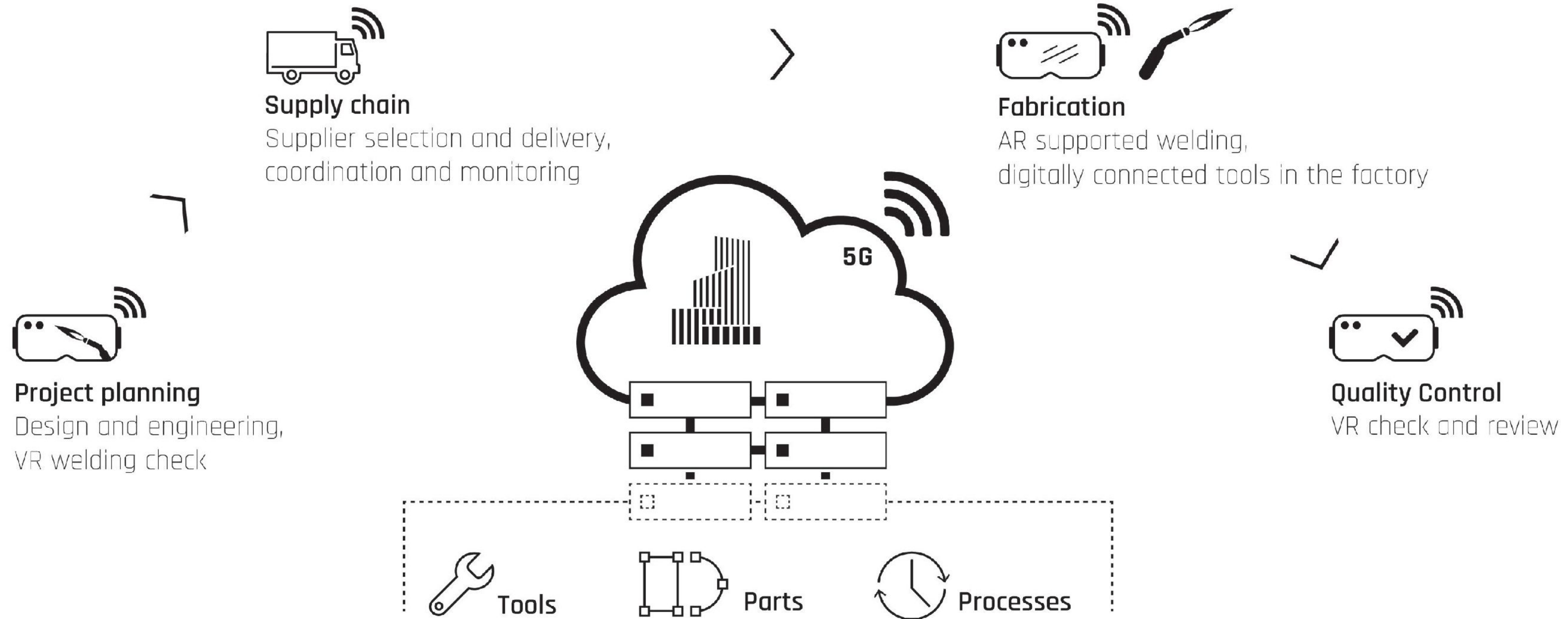
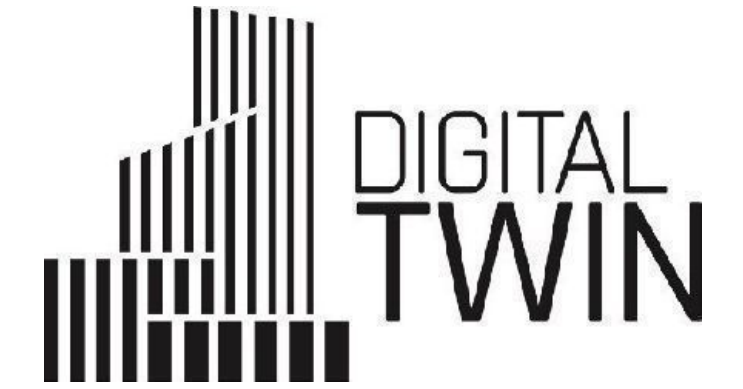
AR-Technology for detailed instructions and remote access

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use case 2

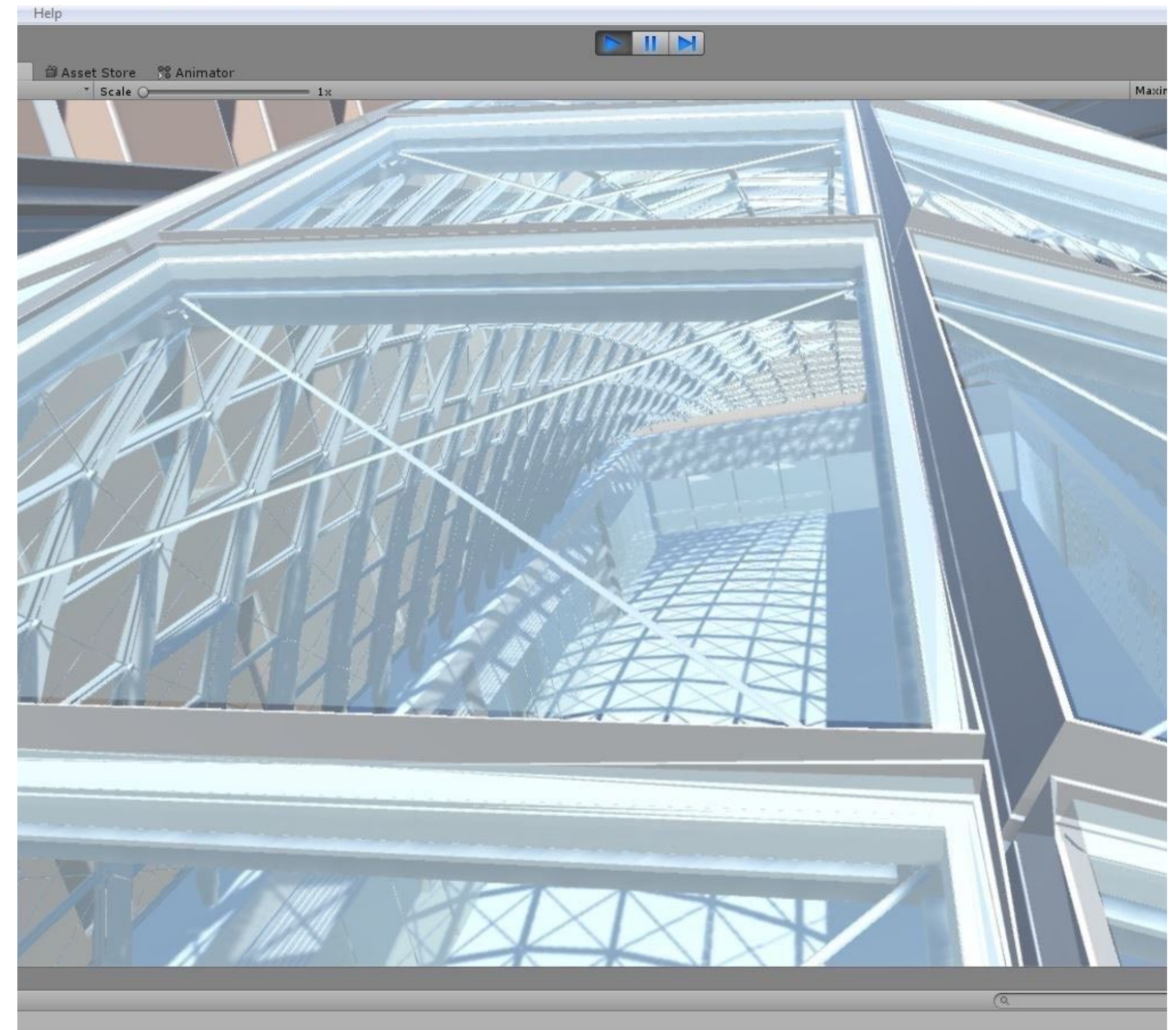
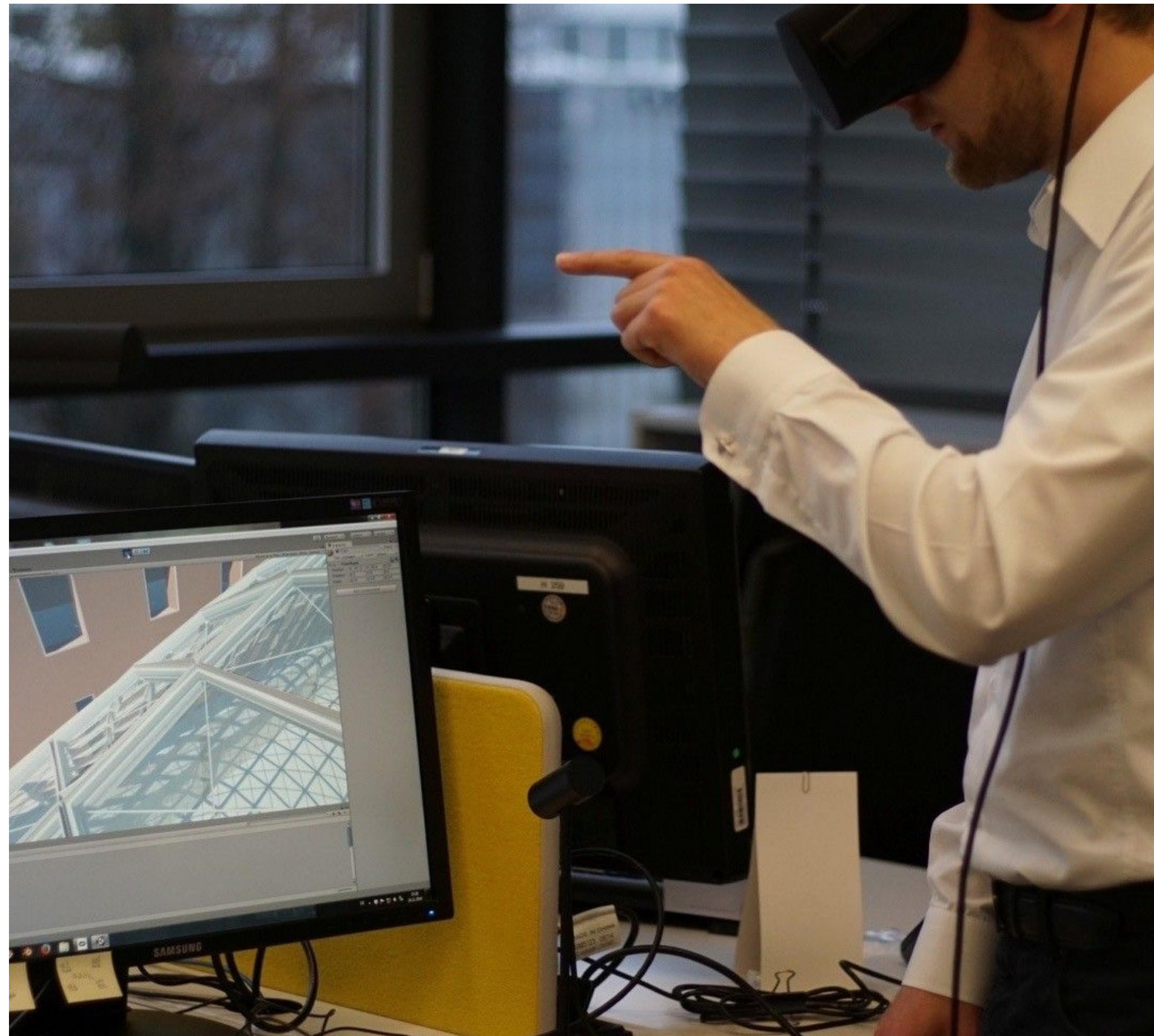
Digital Quality Assurance using Welding as an Example



20 virtual reality technologies

Variant Design and Assembly Sequence Verification

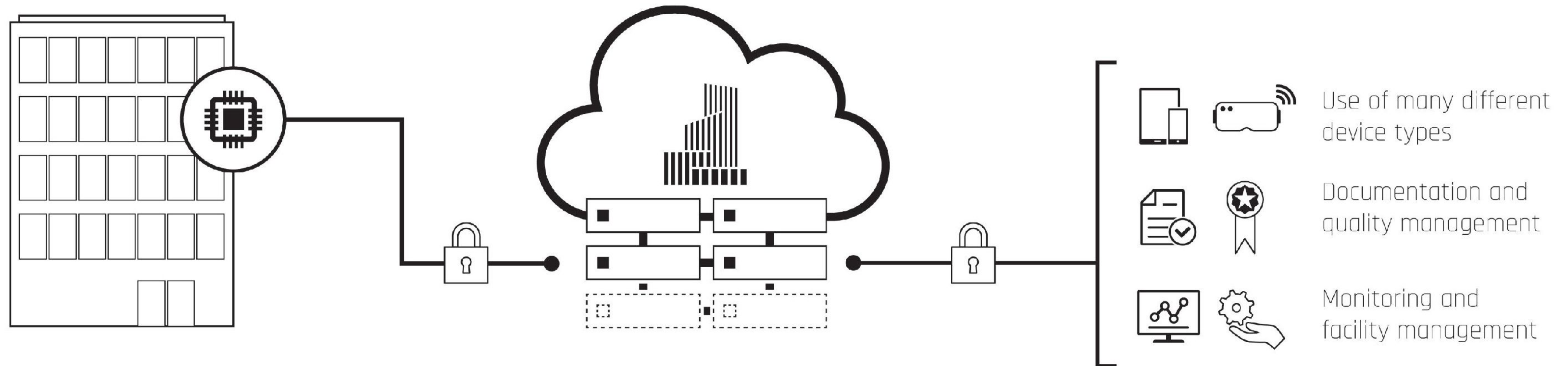
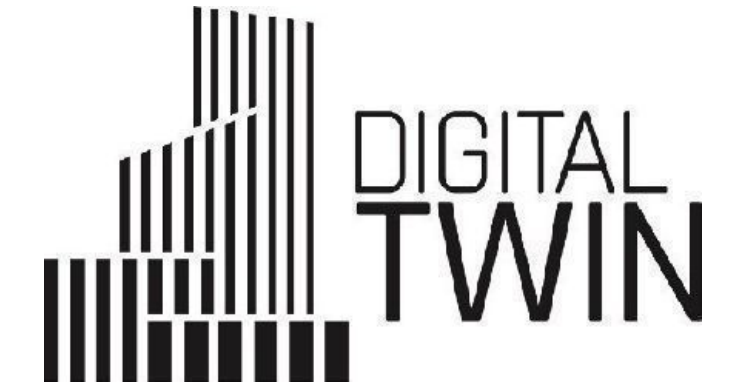
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use case 1

Monitoring for Facility Management and Maintenance Support





ISO Grade #001

Temperature	100%	100%
Humidity	100%	100%
Air Pressure	100%	100%
Wind	100%	100%
Light	100%	100%

ISO Grade #002

Temperature	100%	100%
Humidity	100%	100%
Air Pressure	100%	100%
Wind	100%	100%
Light	100%	100%

Login (Role)

 **Facility Manager**

 **Service Technician**

ISO Grade #003

Temperature	100%	100%
Humidity	100%	100%
Air Pressure	100%	100%
Wind	100%	100%
Light	100%	100%

ISO Grade #004

Temperature	100%	100%
Humidity	100%	100%
Air Pressure	100%	100%
Wind	100%	100%
Light	100%	100%

ISO Grade #005

Temperature	100%	100%
Humidity	100%	100%
Air Pressure	100%	100%
Wind	100%	100%
Light	100%	100%

manufacturing and assembly

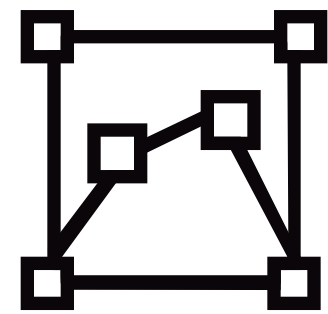
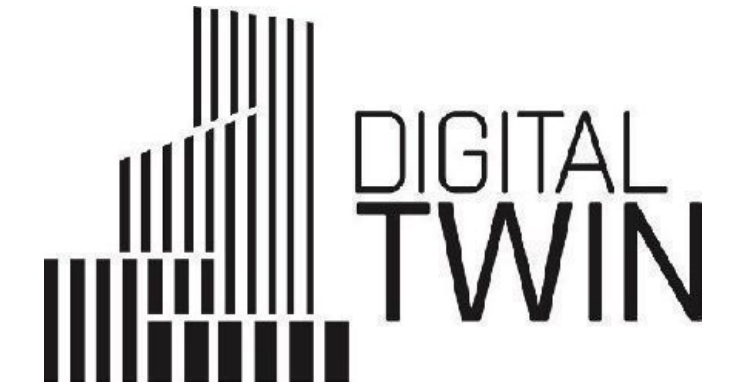
categories and examples



	Single Tasks	Series of Tasks	Interconnected Tasks	Single Tool	Interconnected Tools
VR	Checking Accessibility	Guided Tour (Preparing Assemblies)	Guided Interaction (Preparing Inspections)		Remote Access Data Exchange Data Processing
AR	Picking Things	Support for the correct sequence	Flexible sequences	Video Call	
MR	Checking Accessibility	Support for the correct sequence and geometry	Flexible sequences and geometry		Remote Access Data Exchange Data Processing

25 research tasks

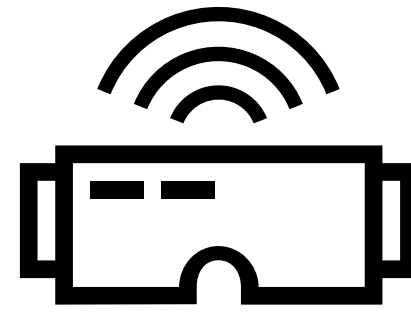
Flexible, Safe and Secured Technology for Demanding Use Cases



**Digital
Ecosystem**



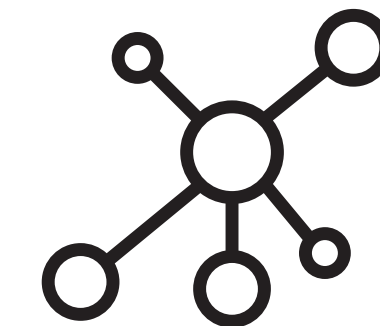
**Communications
Technology (ICT)**



**XR & Machine
Integration**



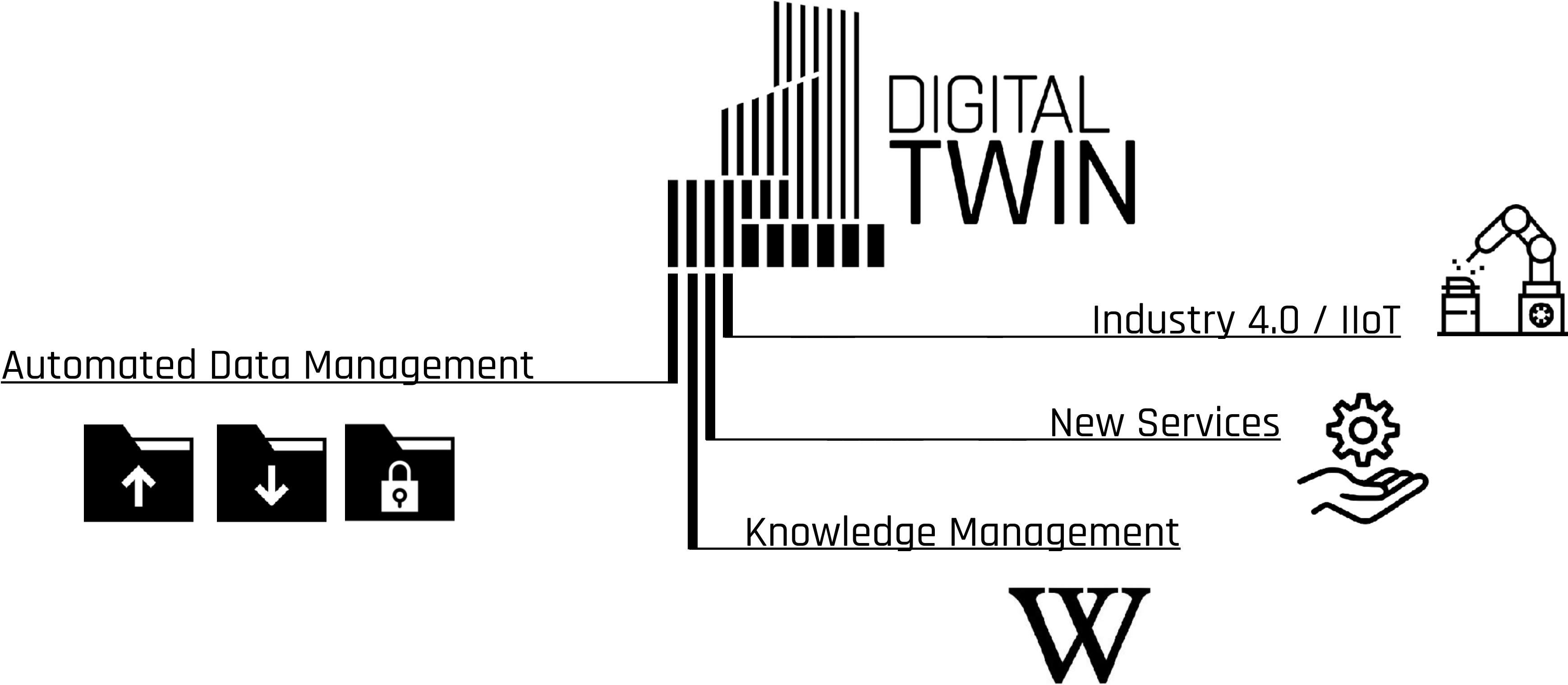
**Data Safety
Data Security**



**System
Integration**

next steps

Interconnected and Integrated Services



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Supported by:



on the basis of a decision
by the German Bundestag

