



ETSI Industry Specification Group ARF: Building interoperability for AR systems

ISG ARF Leadership Team

Objectives and results

- ❖ To define a framework for the interoperability of AR components, systems and services, in order to reduce market fragmentation and enable providers to offer components of complete AR solutions
- ❖ To encourage an ecosystem with a diverse range of solution providers including smaller players, new entrants and academics
- ❖ Publication of a modular functional reference architecture for AR solutions with interoperability provided at the interfaces between building blocks
 - ❖ An important step towards greater interoperability for AR (and more generally XR)
 - ❖ The focus is on interfaces, defining requirements enabling interoperability between building blocks and APIs

ISG ARF membership - February 2023



**AUGMENTED
INTERACTION**

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cniit
consorzio nazionale
interuniversitario
per le telecomunicazioni

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EBU
OPERATING EUROVISION AND EURORADIO

egm

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The XR Experience Platform

FSCOM

Fraunhofer
HHI

Fraunhofer
IIS

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Institut Mines-Télécom

NOKIA

Orchestrating a brighter world

**OPEN
AR CLOUD**

orange™

P

Perey

Schneider
Electric

Sfera

TECHNISCHE HOCHSCHULE NÜRNBERG
GEORG SIMON OHM

T

SIEMENS

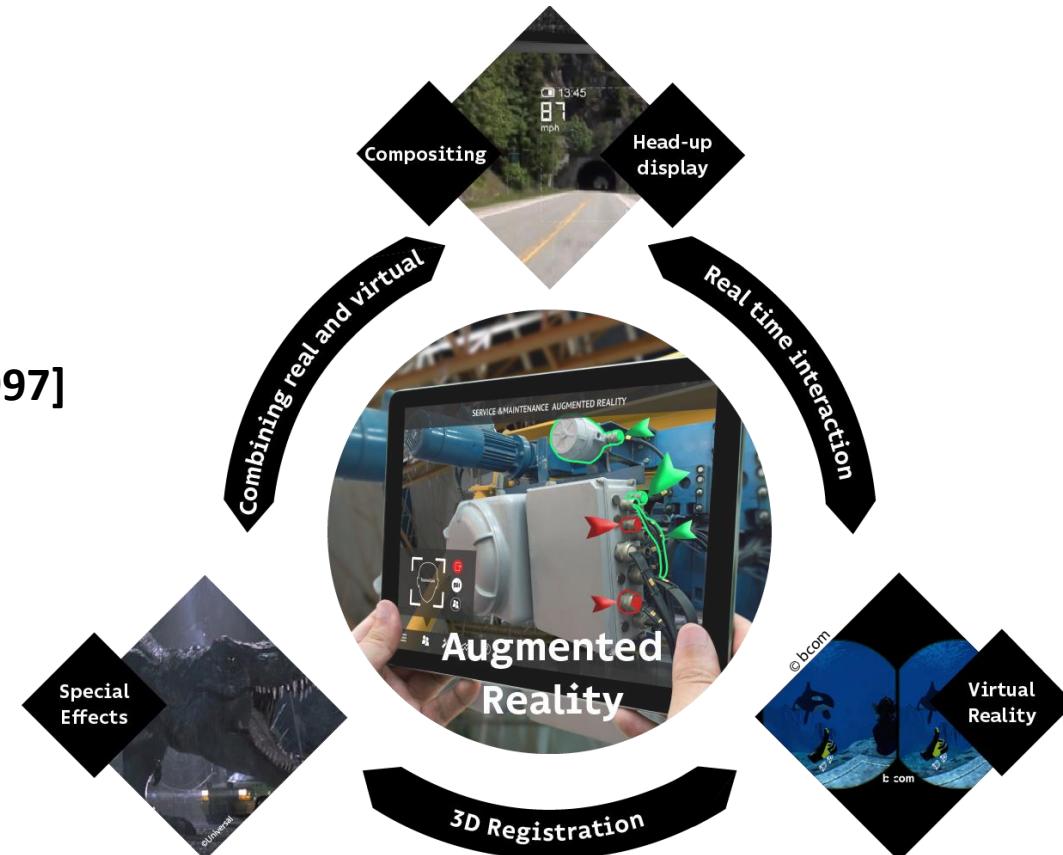
UJI
UNIVERSITÉ DU
LUXEMBOURG

UCD
DUBLIN

Definition of Augmented Reality

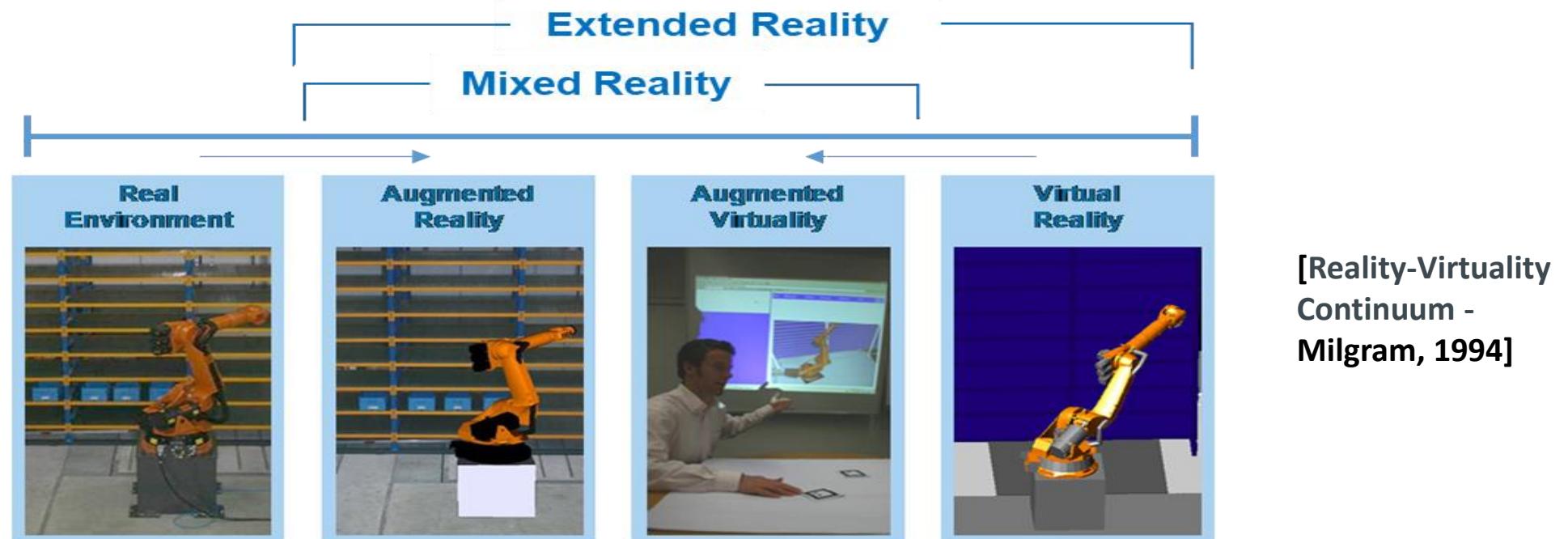
- ❖ Augmented Reality (AR) is the ability to mix in real-time spatially-registered digital content with the real world.
- ❖ Combines real and virtual world
- ❖ Interactive in real-time
- ❖ Registered in 3D

[Augmented Reality - Azuma, 1997]

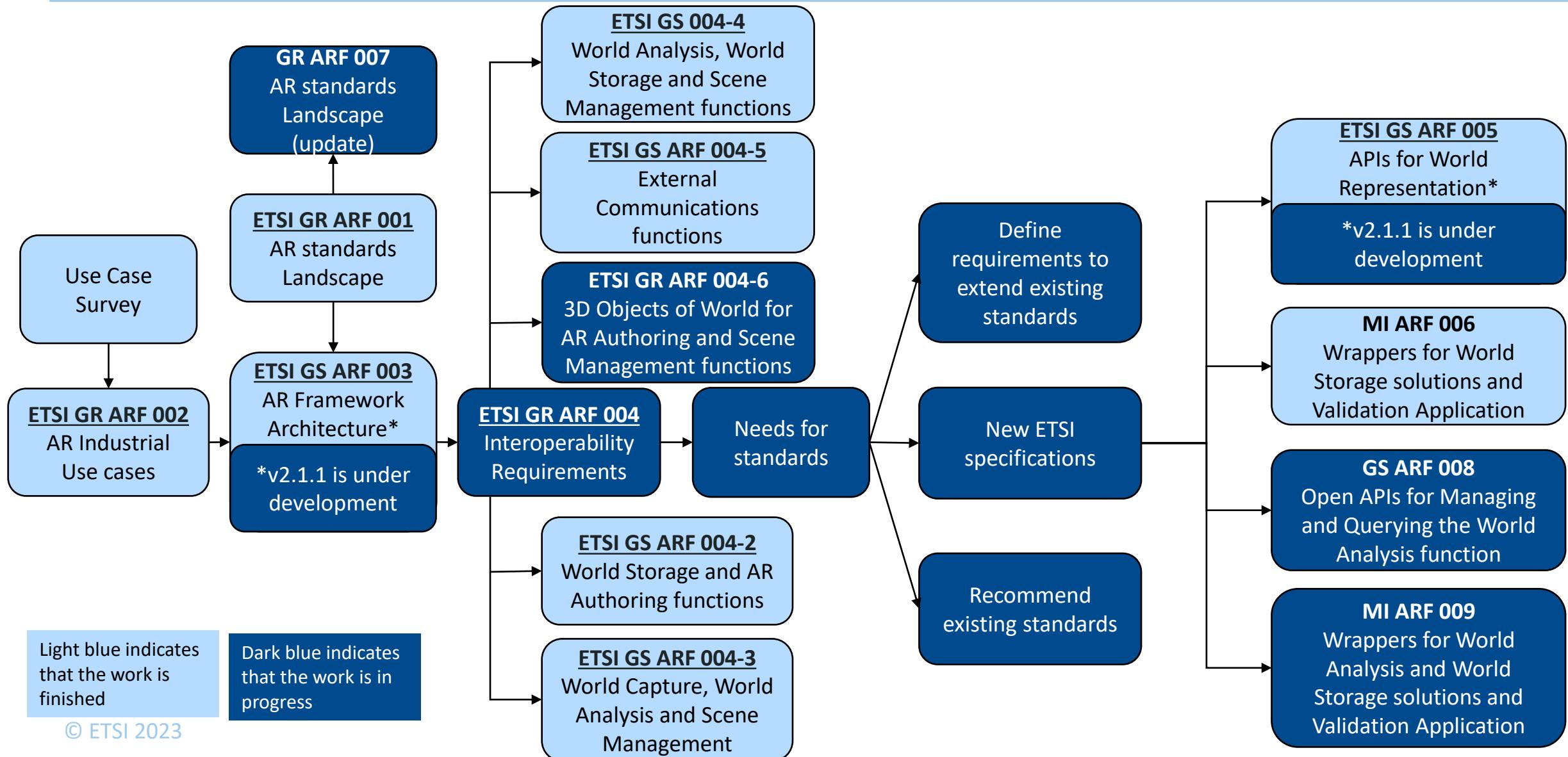


Scope of xReality

- ❖ eXtended Reality (XR) is the umbrella term used for Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), as well as all future immersive technologies.



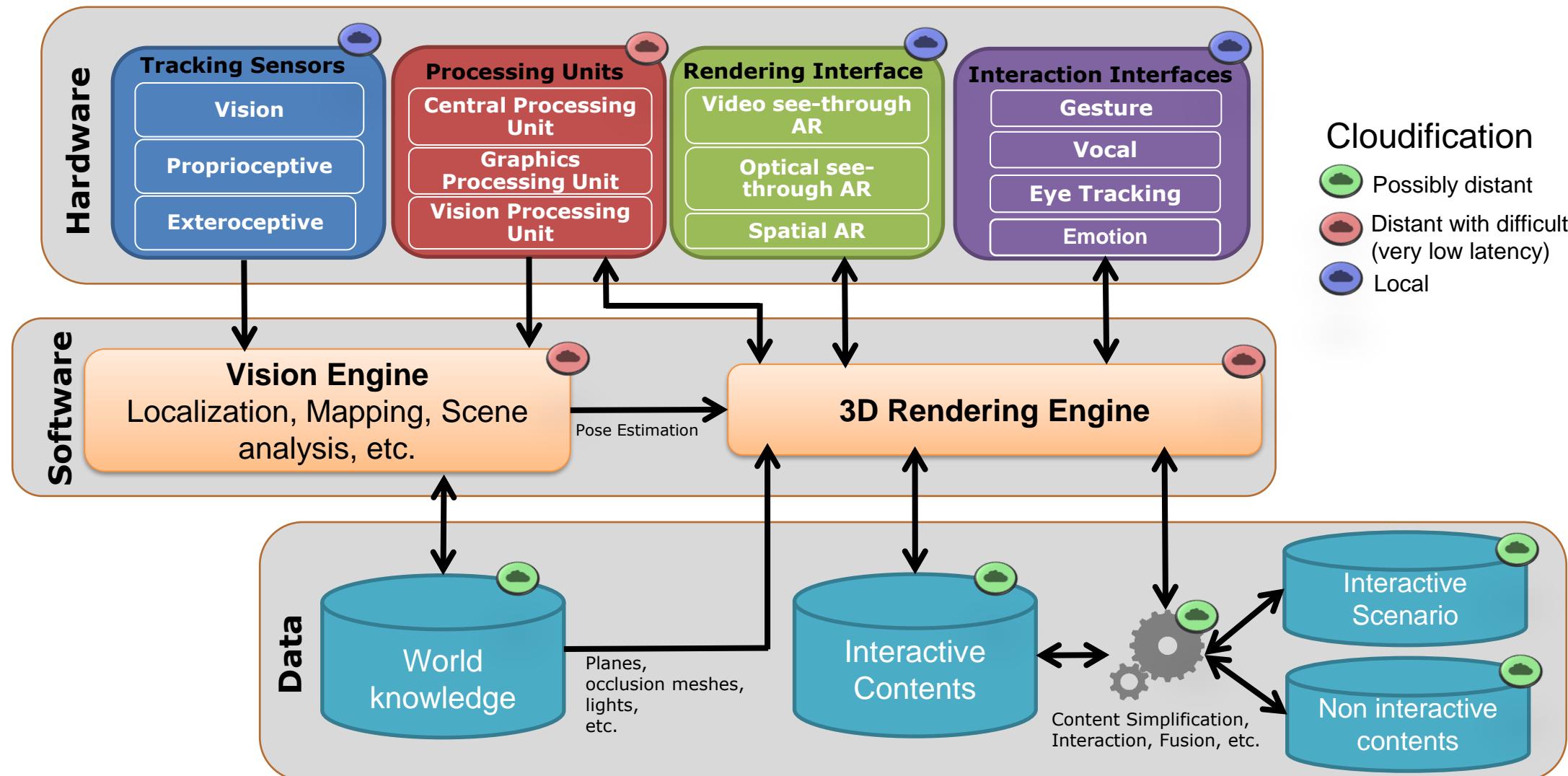
ISG ARF Work Structure



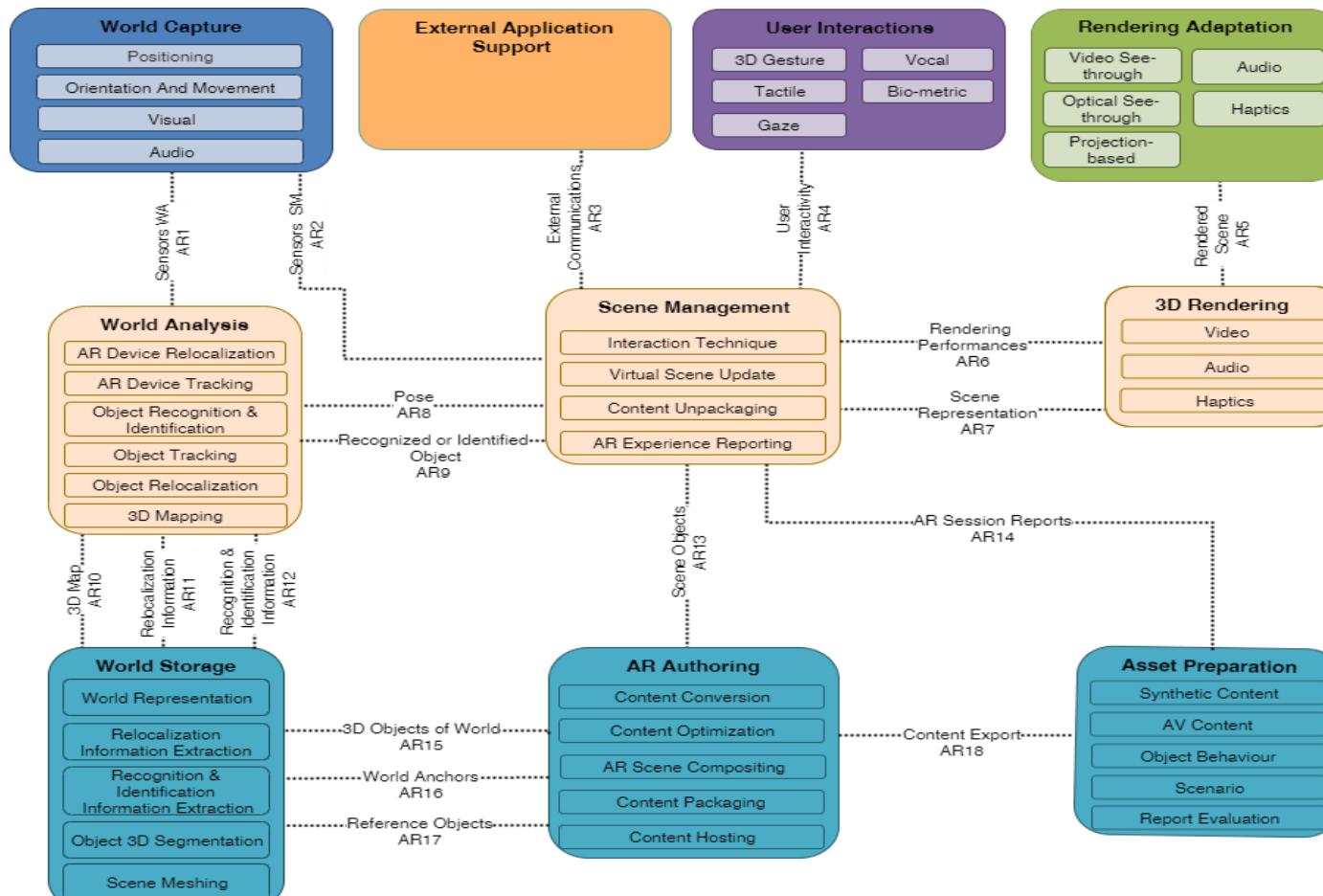
Light blue indicates that the work is finished

Dark blue indicates that the work is in progress

Global overview of the architecture of an AR system



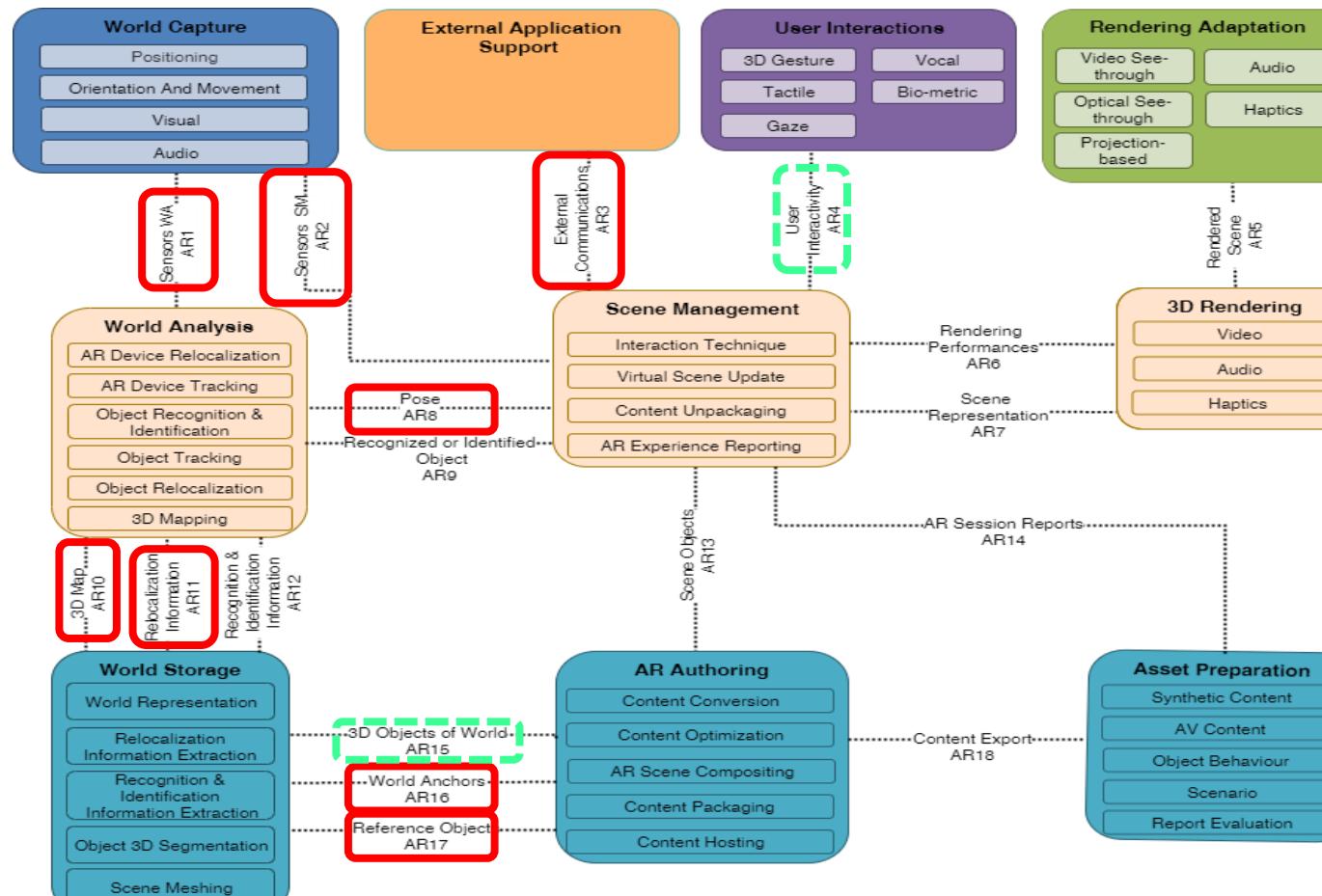
ISG ARF functional reference architecture



For more information see the webinar:
["Overview of ETSI reference architecture for Augmented Reality solutions"](#)



Development of interoperability requirements



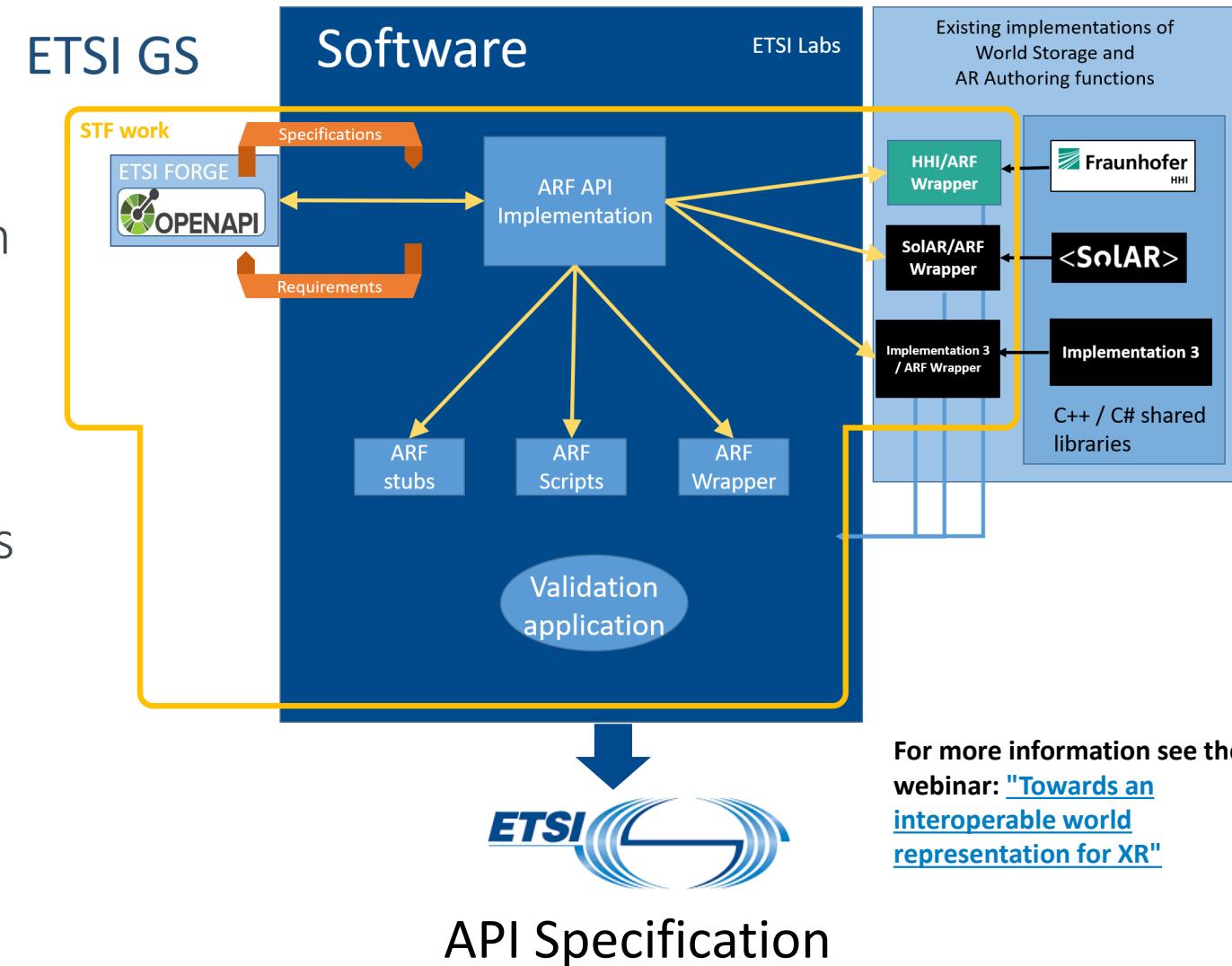
Published Deliverables

- ❖ Standards Landscape: the role of existing standards relevant to AR [ETSI GR ARF 001 v1.1.1](#)
- ❖ Industrial use cases for AR applications and services [ETSI GR ARF 002 v1.1.1](#)
- ❖ Reference architecture for AR solutions [ETSI GS ARF 003 v1.1.1](#)
- ❖ Interoperability Requirements; Overview [ETSI GR ARF 004-1 v1.2.1](#)
- ❖ Interoperability Requirements for World Storage and AR Authoring functions [ETSI GS ARF 004-2 v1.1.1](#)
- ❖ Interoperability Requirements for World Capture, World Analysis and Scene Management [ETSI GS ARF 004-3 v1.1.1](#)
- ❖ Interoperability Requirements for World Analysis, World Storage and Scene Management functions [ETSI GS 004-4 v1.1.1](#)
- ❖ Interoperability Requirements for External Communications [ETSI GS ARF 004-5 v1.1.1](#)
- ❖ Open APIs for the Creation and Management of the World Representation [ETSI GS ARF 005 v1.1.1](#)

World Representation APIs - Implementation Driven Standards Development



- ❖ Iterative process
- ❖ Initial specification of the APIs
- ❖ Implementation of the APIs as Open Source
- ❖ Testing/validation on existing implementations through the development of dedicated wrappers and use cases
- ❖ Publication of an implementation-independent specification (see [ARF GS 005 v1.1.1](#))



Coordination and collaboration are key

- ❖ Partnering with a range of organisations to coordinate efforts for the benefit of the XR ecosystem



MoU in place



MoU in place



By individual membership of participants



MoU in place



MoU in place



A GLOBAL INITIATIVE

Do get involved!

- ❖ More information: <https://www.etsi.org/committee/1420-arf>
- ❖ ISG ToR : [Terms of Reference](#)
- ❖ If your company is **an ETSI member** just register to any ISG ARF meeting
- ❖ If your company is **not an ETSI member**, you can participate after signing the [ARF participant agreement](#)
 - ❖ Access to ISG ARF documentation, subscription to mailing list and participation to online conference calls are free
 - ❖ There is a small fee per day per plenary meeting (F2F/online participation)

THANK YOU