

# Industrial Metaverse Interoperability

## Working Group Charter

### FINAL

Approved by Oversight Committee March 13, 2024

#### 1. Status and Change History

14 November 2023 - v0.5 - Draft

30 January 2024 - v1.0

#### 2. Officers

Frank Salzburger (Siemens)

Guy Martin (NVIDIA)

#### 3. Motivation and Goals (and NON-Goals)

"The industrial metaverse enables collaboration between geographically dispersed teams through virtual environments, expert avatars, digital twins, data visualization, AR/VR and the emerging concept of Shared Reality (SR)"<sup>1</sup>. The metaverse for industrial use cases is expected to be deployed prior to and to grow rapidly by comparison with the consumer market over the next few years. The consumer market is mostly gaming-centric with willingness-to-pay, QoE and form-factors still requiring improvement for mass scale deployment and device proliferation. The industrial metaverse benefits from use-cases having clear and attractive return on investments. While the consumer market is still awaiting a technological breakthrough, the early industry and enterprise use cases have been proven and are closer to deployment at scale.

The metaverse is often confused with the use of XR for interaction with 3D digital content, but when it comes to industrial and enterprise use cases, it is much wider in scope. Beyond topics already addressed by other working groups (connectivity, 3D assets, privacy & security, etc.), topics such as interoperability and communications between digital twins as well as twins and their physical counterparts (including network and geospatial) and secure and commercial asset exchanges for a successful industrial metaverse need to be further developed and studied. Coordination and collaboration between industry associations, forums and SDOs is essential for defining requirements and identifying the best SDOs to develop the necessary standards.

To address the needs for coordination and to accelerate ecosystem development for the industrial metaverse, the goals and scope of this proposed group are the following:

- Identify synergies, needs (requirements), and roadblocks for interoperability in the industrial ecosystem.
- Identify ecosystem gaps
- Collect use cases and functional requirements for the industrial metaverse, beyond the technical requirements already addressed by other Forum Domain Groups.
- Coordinate with relevant organizations (e.g. Catena-X, Gaia-X, Manufacturing-X, digital twin consortium, IDTA, AR for Enterprise Alliance, Open Industry 4.0 Alliance, OPC foundation, Plattform-i40, ...) and SDOs (e.g., ISO/IEC, ITU...) in the industrial field in order to leverage synergies and harmonize the ecosystem.
- Coordinate with other Forum Domain Groups on technical aspects to ensure expectations from the industrial ecosystem are met (e.g. network KPIs).

In order to avoid overlap with other working groups and Forum activities, this proposed group will not work on deliverables that are already covered by existing working groups, but contribute Industrial Metaverse-specific aspects to these groups:

- Network requirements and capabilities
- 3D assets interoperability
- 3D web interoperability
- Cybersecurity and Identity
- Efficient collaboration
- Real/Virtual world integration

- Standards Registry

#### 4. Project Deliverables and Requirements

The expected deliverables for this group include documentation of:

- Relevant industrial metaverse use cases
- Existing resources (e.g., architectures, standards, etc) applicable to industrial metaverse use cases and for the partial achievement of the objectives of this WG
- Gaps in ongoing standardization efforts

Based on the above deliverables, the working group will develop:

- Prioritized roadmap on industrial metaverse requirements
- Materials to inform (SDOs, among others), to educate target audiences and to accelerate industrial metaverse adoption and deployments at scale through liaison agreements, workshops, and production of white papers with relevant organizations

#### 5. Milestone Plan

We will follow a 6-phase process: Discovery, Planning, Execution, Research & Analysis, Output & Delivery. During the Discovery phase, specialized task groups will be formed to develop domain expertise and leverage to collaborate with and advise other working groups and sub-groups on their specific use cases and scenarios. The initially planned task groups are as follows:

1. Clarification of IMV definitions/Develop and collect use-cases
2. Document existing resources developed outside MSF and that address the industrial metaverse (may be by another name)
3. Definition of high-level conceptual model
4. Requirements for industrial metaverse
5. Ecosystem dissemination

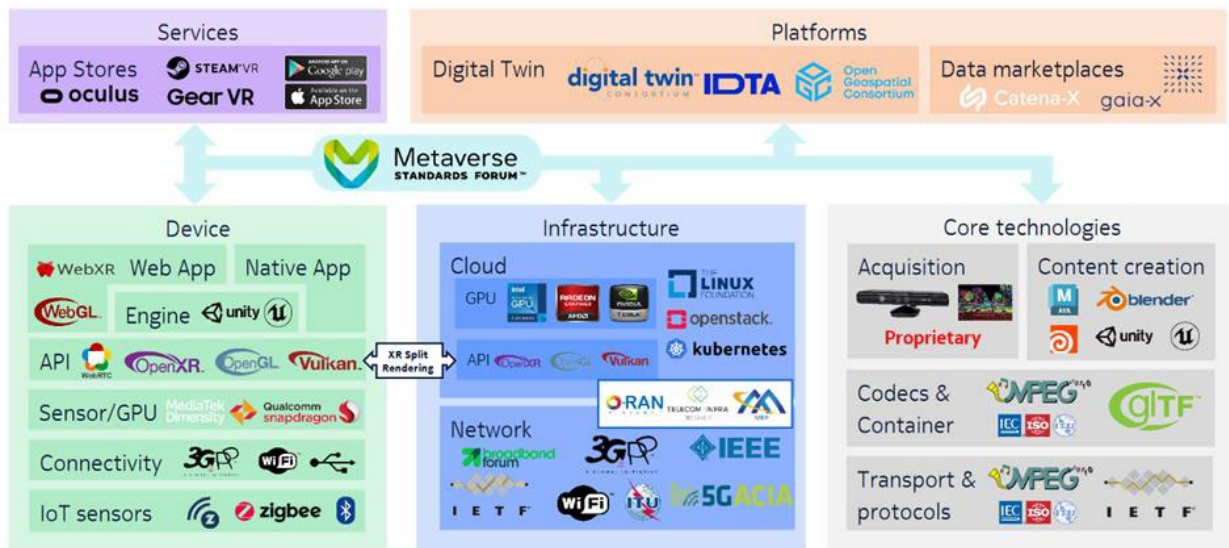
The task groups will be assigned 6-12 months of working duration (renewable based on the outcome), within which the leads of each task group will work closely with the co-chairs of the Industrial Metaverse Interoperability Working Group to stay aligned and execute the charter's agenda as appropriate.

Phase	Description	Milestone	Start	Duration
1	Clarification of IMV definitions	Definitions submitted to the MSF Glossary	T0	3 months
1	Collection and development of use cases and requirements for industrial metaverse	Submission of use cases to the MSF Use Case Register	T0	3 months
2	Document existing resources developed outside MSF that address the industrial metaverse (maybe by another name) and gaps in ongoing standardization efforts	Publication of state of the art document	T0+3	3 months
3	Development of a high-level conceptual model	Publication of conceptual model	T0+6	3 months
4	Final requirements for industrial metaverse, minimal requirements for interoperability	Publication of requirements	T0+9	3 months
5	Ecosystem dissemination		T0+12	3 months

## 6. Coordination

The Group shall coordinate with the Standards Register Working group for identifying and reaching out to relevant organizations.

The Group shall seek to encourage appropriate companies and SDOs as outlined below to join the Forum, or alternatively enter external liaisons in accordance with Forum-defined liaison procedures.



## 7. Communication Plan

The Working Group will provide updates to the Forum Oversight Committee and Forum membership every 6 months or when major milestones are achieved.

The Working Group will provide material to the outreach task force to feed potential dissemination actions.

## 8. Risk Factors

Principal risk for this proposed group is that the ecosystem (SDOs, organizations, forums, ...) refuses to collaborate with Metaverse Standard Forum on a common ground.

It's possible that this Risk Factor is included in the above (depending on how "ecosystem" is defined): There are no (or insufficient number of) actual industrial metaverse customers involved in this working group. In the absence of the perspectives of those already deploying these emerging technologies, there risks over-emphasizing on only those problems that providers of technologies and services wish to address.

## 9. Working Group Renewal

Every 24 months

## 10. Project Funding and Resources

None