

D5.3: Report on collaboration with other existing EU initiatives (V1)

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Abstract	This report details efforts to engage EU initiatives in Virtual World technologies. It covers the first 18 months, mapping key stakeholders, analysing technological trends, and fostering collaboration through structured frameworks. By aligning with European initiatives, it ensures a sustainable, community-driven approach and lays the groundwork for future activities of the project that will engage those initiatives.
Keywords	



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* R: Document, report (excluding the periodic and final reports)

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

DATA: Data sets, microdata, etc.

DMP: Data management plan

ETHICS: Deliverables related to ethics issues.

SECURITY: Deliverables related to security issues

OTHER: Software, technical diagram, algorithms, models, etc.



EXECUTIVE SUMMARY

This report describes the coordination efforts, engagement strategies, and progress in fostering collaboration with EU initiatives executed within Task 5.3 and focused on Virtual World technologies.

It covers the first 18 months of the project with an update on month 36. The document reflects efforts to map, engage, and collaborate with key stakeholders, including research institutions, industry leaders, and policymakers, providing a strategy for fostering meaningful partnerships.

A structured and dynamic inventory of EU Virtual Worlds initiatives has been developed, helping to analyse technological diversity, identify gaps, and uncover opportunities for innovation and standardisation. Additionally, the report introduces structured collaboration frameworks to facilitate knowledge-sharing, joint activities, and alignment with broader European digital transformation strategies. These frameworks ensure that engagement efforts contribute to actionable outcomes and reinforce the development of the OPENVERSE Technology Framework (OTF).

By integrating engagement efforts within the broader objectives of OPENVERSE, this report ensures that Virtual Worlds technologies are developed in a sustainable and community-driven manner. Furthermore, it establishes a foundation for long-term growth beyond the project's lifespan, identifying key contributors and viable operational models to support the continued evolution of Virtual Worlds as a central element of Europe's digital innovation landscape.

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ABBREVIATIONS

AI	Artificial Intelligence
BB	Building Block
EC	European Commission
EU	European Union
IoT	Internet of Things
IP	Internet Protocol
IPR	Intellectual Property Rights
OETF	OPENVERSE Ecosystem Task Force
OTR	OPENVERSE Technology Framework
PPP	Public-Private Partnership
R&I	Research and Innovation
TCP	Transmission Control Protocol
XR	Extended Reality

1 INTRODUCTION

Virtual Worlds are becoming an increasingly significant part of the digital landscape, offering immersive environments that drive innovation across multiple sectors, including industry, education, entertainment, and governance. This report serves as a key milestone in Task 5.3 of the OPENVERSE project, detailing the coordination efforts, engagement strategies, and progress made in establishing a network of collaborations with EU initiatives focused on Virtual World technologies.

This deliverable, D5.3, reports on the first 18 months of the project and acts as a foundation for future activities, including the forthcoming D5.4 report and the final D5.7 deliverable. The work presented here follows two main strands: the development of a holistic technological framework and the engagement with EU initiatives. The latter serves as a crucial enabler of the former, ensuring a broad, representative, and expert-driven approach to shaping the European ecosystem of Virtual Worlds.

The primary objective of this deliverable is to document the efforts taken to map, engage, and collaborate with relevant European initiatives in the field of Virtual Worlds. The report provides an evolving and comprehensive strategy that focuses on engagement – from mapping of projects, a critical tool for understanding the European landscape, to fostering meaningful collaborations. Additionally, the work carried out contributes to other tasks within the OPENVERSE project, such as the Virtual Worlds Observatory, ensuring alignment and synergy across work packages. Finally, this report lays the groundwork for the OPENVERSE Technology Framework (OTF), which aims to establish a comprehensive, sustainable, and community-driven technological framework for Virtual Worlds in Europe.

By covering the mapping process and engaging with European initiatives focused on Virtual Worlds, a structured and dynamic inventory of these initiatives is being developed to ensure that all relevant stakeholders, including research institutions, industry leaders, and policymakers, are identified and actively engaged. The mapping effort also evaluates the diversity and complexity of Virtual Worlds technologies, analysing key trends, identifying gaps, and uncovering opportunities for standardization and innovation within the European ecosystem.

Additionally, the deliverable establishes structured collaboration frameworks designed to foster knowledge-sharing, joint activities, and strategic alignment with broader European digital transformation strategies. These collaboration frameworks facilitate coordination between various stakeholders and ensure that engagement efforts are effectively channelled into actionable outcomes.

Furthermore, the report integrates these engagement efforts within the broader objectives of the OPENVERSE project, ensuring that the findings contribute directly to the creation of a holistic and inclusive technological framework. By consolidating insights from multiple sources, the framework will reflect a broad spectrum of technological and regulatory considerations, ensuring a sustainable and forward-looking approach to Virtual Worlds development.

This deliverable also aims to promote sustainability and long-term growth of the Virtual Worlds ecosystem beyond the lifespan of the OPENVERSE project. By identifying potential operational models and main contributors in the European community, it lays the groundwork for continued support and expansion. The insights gathered will be instrumental in ensuring that Virtual Worlds technologies remain a key component of Europe's digital innovation landscape, fostering collaboration, standardisation, and the seamless integration of new technological advancements.

This deliverable seeks to:

- **Provide a comprehensive mapping:** Develop and maintain a dynamic database of European Virtual World initiatives, categorizing them based on technological domains, use cases, and strategic importance.
- **Facilitate coordination and collaboration:** Establish strategic collaborations and foster value for industry, academia, and policymakers to enhance interoperability and innovation.
- **Support IPR and standardization efforts:** Align the engagement efforts with existing and emerging EU policies and standards to ensure compliance and promote harmonization in Virtual Worlds development in liaison with *T3.5 IPR and Governance Models for Open and Human Centric virtual worlds* and *T6.1 Input to industry standards*.
- **Contribute to the OPENVERSE Technology Framework:** Utilize the insights gathered through engagement to refine and enhance the OTF, ensuring it reflects a broad spectrum of technological and regulatory considerations.
- **Promote sustainability and future growth:** Lay the foundation for ongoing support and expansion of the OPENVERSE technology framework beyond the OPENVERSE project lifecycle by identifying potential contributors and operational models.

By providing a structured and detailed overview of the work accomplished, this document aims to report on the activities towards supporting stakeholders in the Virtual Worlds sector in understanding the current European landscape of Virtual Worlds while setting the stage for continued progress and collaboration in this rapidly evolving field.

2 STRATEGY AND METHODOLOGY

The primary focus is on the creation of a group of strategic stakeholders that would serve the co-creation of a Technology Framework for the European Virtual Worlds, while reinforcing links between the different technological areas, infrastructures, and disciplines behind the different elements that compose Virtual Worlds. Hence, the stakeholder engagement strategy is key for successfully building trust, collecting interests, and ensuring project goals.

The strategy foresaw the engagement of experts around the OPENVERSE project with the purpose of creating a heterogeneous ecosystem, representing those technological areas enabling the creation of Virtual Worlds. The representation of the technological areas is meant to be equally distributed across the number of engaged stakeholders. However, a strategic importance was decided to be given to XR technologies, as those play a main role in the development and uptake of virtual worlds.

The fundamental points to consider for the engagement strategy are:

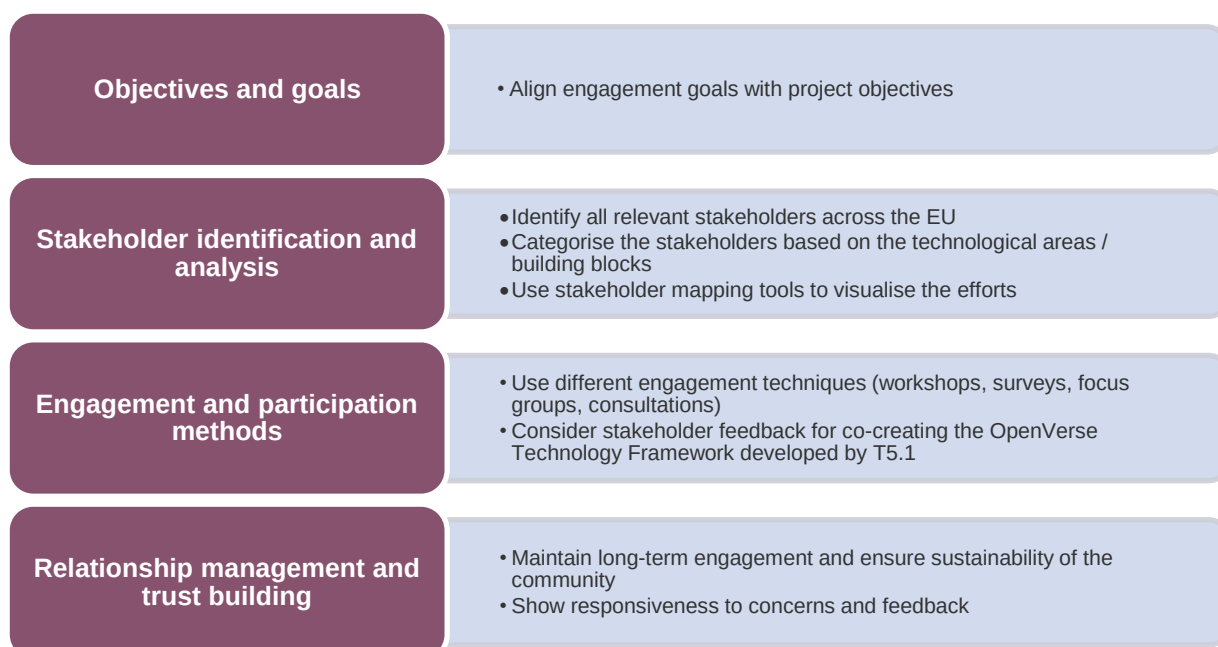


Figure 1 - Engagement strategy of T5.3

To follow this strategy, a methodology has been defined to systematically map, engage and solidify the relations with several stakeholders in the Virtual Worlds sector across the EU. A collaborative work among the WP5 participants has been done to define the *technological areas* and the *categories of stakeholders*. This was necessary given the nature of Virtual Worlds, as a set of technologies encompassing different technological areas as well as including several types of potential stakeholders.

3 LINK TO OPENVERSE OBJECTIVES AND GOALS

T5.3 supports and strongly links to 2 objectives of the OPENVERSE project, namely:

- *OO7: Promote interdisciplinary cooperation of specialists from various sectors, including robotics, computer science, education, psychology, sociology, and design, in order to comprehensively address the opportunities and difficulties posed by the Virtual worlds. This will foster the exchange of information, resources, and best practices while preserving an open environment*
- *OO8: Collaborate with other initiatives to consider Virtual worlds as part of their roadmaps, align with each other, generate and discuss requirements, and facilitate alignment and implementation actions*

Achieving the objectives requires a strong focus on ensuring the long-term sustainability of the community being built. To this end, the synergies and collaborations fostered by this task follow a structured methodology designed to maintain long-term engagement among participants. By establishing a clear purpose and shared goals centred on Virtual Worlds that are open, accessible, ethical, and aligned with EU values, stakeholders will remain engaged over time.

The synergies created to reach the objectives are not only created with external stakeholders, but also internally to the project. WP5 has identified a number of Tasks within OPENVERSE with which WP5 should collaborate to reach its objectives. Those are mainly related to the work performed under T5.1 - Technological Synergies and its objective of drafting a Technological Framework¹. As seen below Figure 2, T5.3 is providing a set of collaboration across WPs, for which the engagement of external stakeholders is considered as an added value. In fact, T5.3 will ensure to engage expert third parties to the conversation between WP5 and other WPs around the Technological Framework. In this endeavour, T5.3 is supporting the collaboration with Tasks from WP2, WP3, WP6 as visualised as follows:

¹ The OPENVERSE Technological Framework will be delivered at M36 and described on D5.7

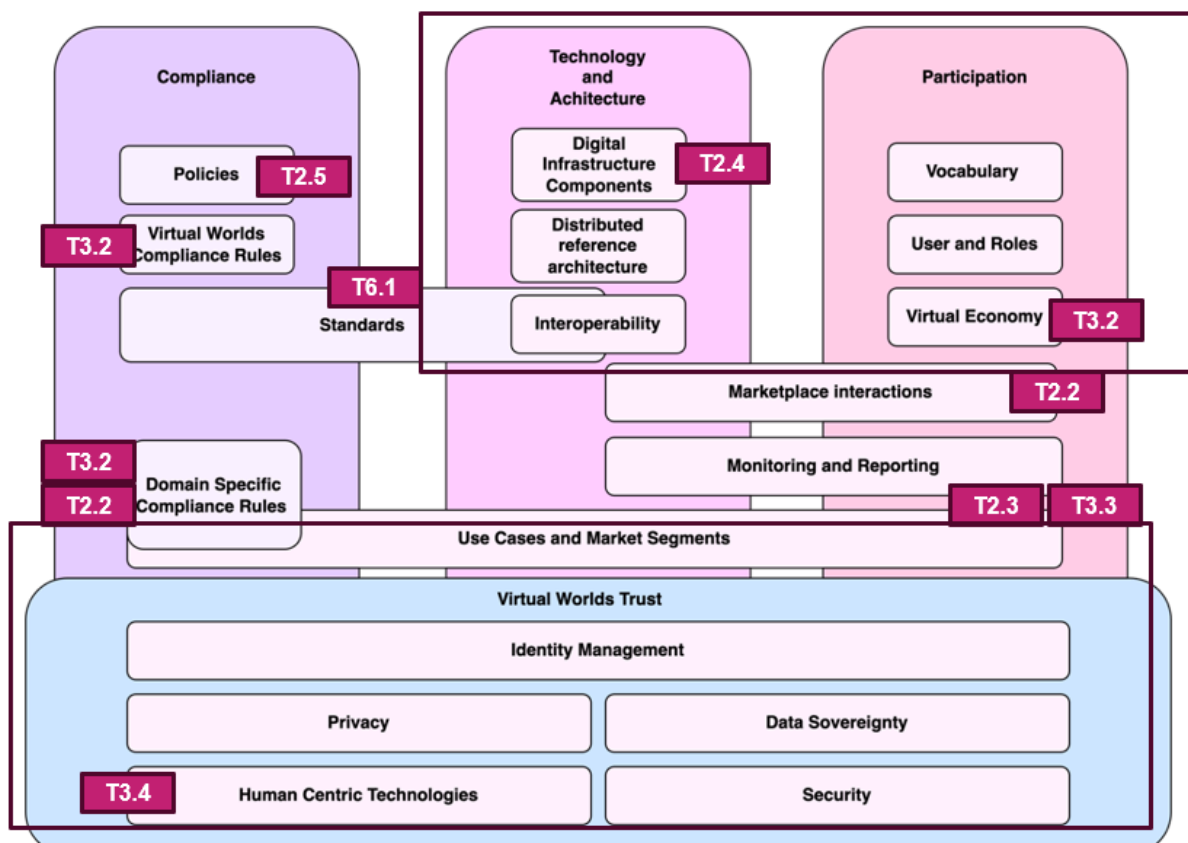


Figure 2 - initial structure of the OPENVERSE Technological Framework

To this picture, the collaboration with WP4 – Communications is not showed, since it is orthogonal to all of these. WP4 is the vehicle to support the dissemination and communications on the work conducted.

Furthermore, to support the project and WP5 objectives and the relations with other WPs, T5.3 aims at ensuring active participation through knowledge-sharing, contributions, and co-creation activities, fostering a sense of ownership and commitment to the community. Engagement is further strengthened through recurring events and workshops, which will increase in frequency and become more specialised as the project progresses.

Ultimately, all stakeholder activities are value-driven, ensuring that participants receive tangible benefits such as exclusive insights, learning opportunities, networking, and connections with EU policymakers. This approach not only sustains engagement but also reinforces the long-term impact and relevance of the community.

4 STAKEHOLDER IDENTIFICATION AND ANALYSIS

To efficiently analyse the stakeholders, we followed a three-step approach. First to identify them according to a given ecosystem, then to classify them according to the stakeholder type, and finally to map them in a comprehensive figure that could show them easily.

For the first point, the technological areas related to Virtual Worlds require multiple building blocks to create immersive and engaging experiences for users. After a series of meetings among the partners, the decision to base the technological areas on the classification made by the *Commission Staff Working Document* accompanying the EC Communication *an EU initiative on Web 4.0 and virtual worlds: a head start in the next technological transition*² published by the European Commission in July 2023 was taken. This decision was taken to ensure continuity with the consultative work performed by the European Commission to draft the document and align with it. Such decision was taken for the whole WP5 activities, applying to all the Tasks part of it.

Thus, the partners selected the following technological areas, also called building blocks, as key enablers of virtual worlds:

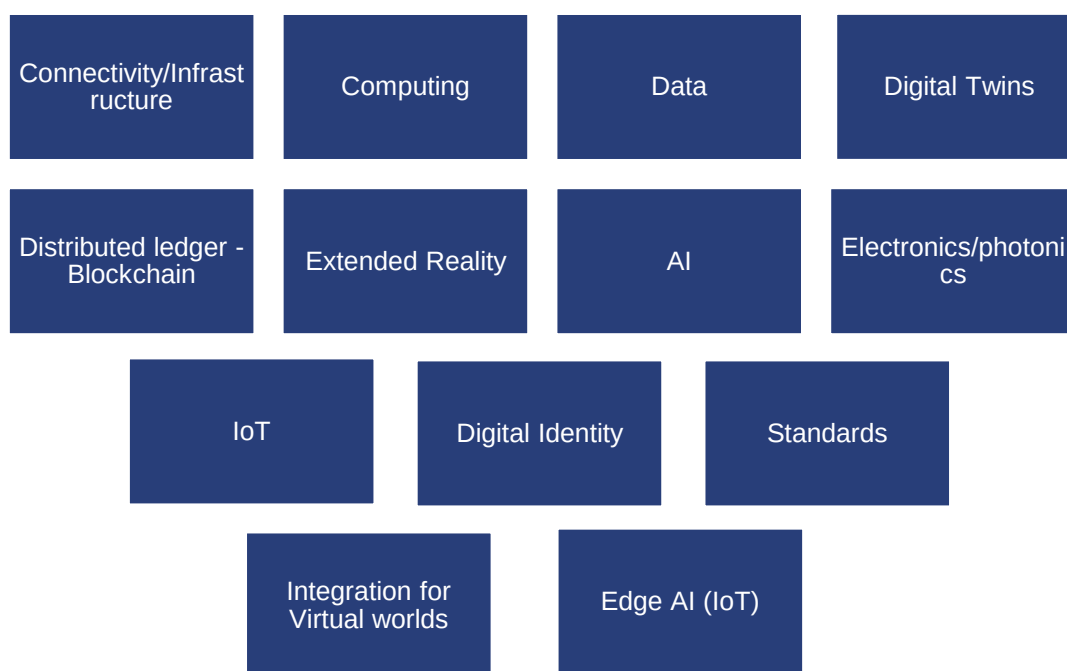


Figure 3 - Building blocks of Virtual Worlds

For simplicity, the explanations on what each of the above technological areas contributes to the enabling of virtual worlds is not reported in this deliverable. To know more, please refer to the *Commission Staff Working Document* above mentioned.

² European Commission: *Commission Staff Working Document accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions an EU initiative on web 4.0 and virtual worlds: a head start in the next technological transition* (2023) <https://digital-strategy.ec.europa.eu/en/library/staff-working-document-information-insights-and-market-trends-web-40-and-virtual-worlds>

4.1 STAKEHOLDERS CLUSTERING

There are different types of initiatives and organisations that have been identified and engaged within the context of T5.3. To efficiently work with them, the fundamental requirements to be considered are to be based in the European Union and not being a private company. The rationale for the first requirement consists in ensuring a European vision to the consultative aim that this group is meant to bring to the project. This doesn't not mean that non-EU organisations and initiatives are excluded a-priori, but rather those are engaged through T5.4 *Support international collaboration with relevant Global initiatives on virtual worlds*. Second, the decision to not engage directly with private companies was taken to prevent private commercial interests of a single company steering the discussions of the group of stakeholders. However, to ensure a strong link to the European market, and especially its SMEs, private companies can still be represented by any kind of associations they are part of.

The starting point to define the types of initiatives and organisations on which T5.3 focuses were the following macro-categories:

- Industrial initiatives on Virtual Worlds or any of the related building blocks
- Associations and no-profit organisations addressing Virtual World or any of the related building blocks
- European funded projects

Based on those macro-categories the following categories for clustering the EU initiatives were selected:

- EC-led initiative: initiatives that are ideated and funded by the European Commission as to support a specific goal and/or strategy put in place at EU level.
- EU project (not XR): EU-funded projects on the related technological areas listed above. The projects considered are funded under Horizon Europe or Digital Europe Programme and should have a link to XR.
- EU project (XR): EU-funded projects on extended reality. The projects considered are funded under Horizon Europe or Digital Europe Programme.
- Funding programme: State or European grant/loan supporting programmes released by public administrations to any loan parties.
- Governmental agency: governmental body, with a certain degree of autonomy, that supports the government in delivering policies and keeping oversight on specific functions.
- EU Joint Undertaking: at EU level those are considered as mutually beneficial public-private partnership necessary for the efficient execution of EU research, technological development and demonstration programmes.
- Non-profit organization: a group organized for purposes other than generating profit and in which no part of the organization's income is distributed to its members, directors, or employees.
- Contractual Public-Private Partnerships: similar to the EU joint undertakings, PPPs are helping the execution of EU research, technological development and demonstration programmes but under a different legal status.

- R&I organization: organization that promotes research and innovation in the EU or in one EU member state
- Research centre: organization that is pursuing research as its main activity.
- Think Tank: research institute that performs research and advocacy concerning topics such as social policy, political strategy, economics, military, technology, and culture.

A special note should be given to the differentiation of the 2 categories *EU project (not XR)* and *EU project (XR)*. The engagement of all EU funded projects on each building block was considered neither fit-for-purpose, nor feasible. Thus, considered that XR technologies are fundamental in the development and uptake of virtual worlds, and are also specific funding area of EU R&I projects, the strategic decision to make a differentiation among the 2 categories was taken. In practical terms, this decision led to the 2 categories of stakeholders: *EU projects (not XR)* to focus on a selection of EU projects related to all the building blocks but still with a reference to XR, and *EU project (XR)* a category for which most of the EU funded projects were selected for potential collaboration.

4.2 MAPPING OF STAKEHOLDERS

Once the technological areas and the categories of stakeholders have been defined, the partners started a series of activities to map the stakeholders across the EU. First, each of the partners involved in T5.3 were tasked with adding stakeholders from their own networks. A tab in an excel table used by WP5 to map all the stakeholders engaged through T5.2, T5.3 and T5.4 was created. The aim was to organise the inputs and evaluate the relevance of each stakeholder to the objectives of the Task. After a first round of research, the mapping continued with desk research, performed by each partner under the supervision of the Task leader.

This exercise supported the specific objective reported in the introduction of this document to develop and maintain a dynamic database of European Virtual World initiatives, categorizing them based on technological domains, use cases, and strategic importance. Moreover, it helps facilitate coordination and collaboration by establishing strategic collaborations and foster value for industry, academia, and policymakers to enhance interoperability and innovation.

Finally, the mapping of the stakeholders has a direct positive impact to the other objectives listed in the Introduction as the stakeholders mapped, once engaged, have been and will be useful for the achievements of linked objectives related to the collaboration with other Tasks or WPs. Those are:

- Supporting IPR and standardization efforts by aligning the engagement efforts with existing and emerging EU policies and standards to ensure compliance and promote harmonization in Virtual Worlds development in liaison with *T3.5 IPR and Governance Models for Open and Human Centric virtual worlds* and *T6.1 Input to industry standards*.
- Contribute to the OPENVERSE Technology Framework developed under T5.1 by utilising the insights gathered through engagement to refine and enhance the Technology Framework, ensuring it reflects a broad spectrum of technological and regulatory considerations.
- Promote sustainability and future growth for the whole project, by laying the foundation for ongoing support and expansion of the OPENVERSE Technology Framework beyond the OPENVERSE project lifecycle by identifying potential contributors and operational models.

Moreover, the project produced a visualisation map to depict the distribution of actors across the different building blocks. At first, the idea was to generate a map putting at the centre the European Commission and around the building blocks. Within each of the areas of the building blocks, the EU

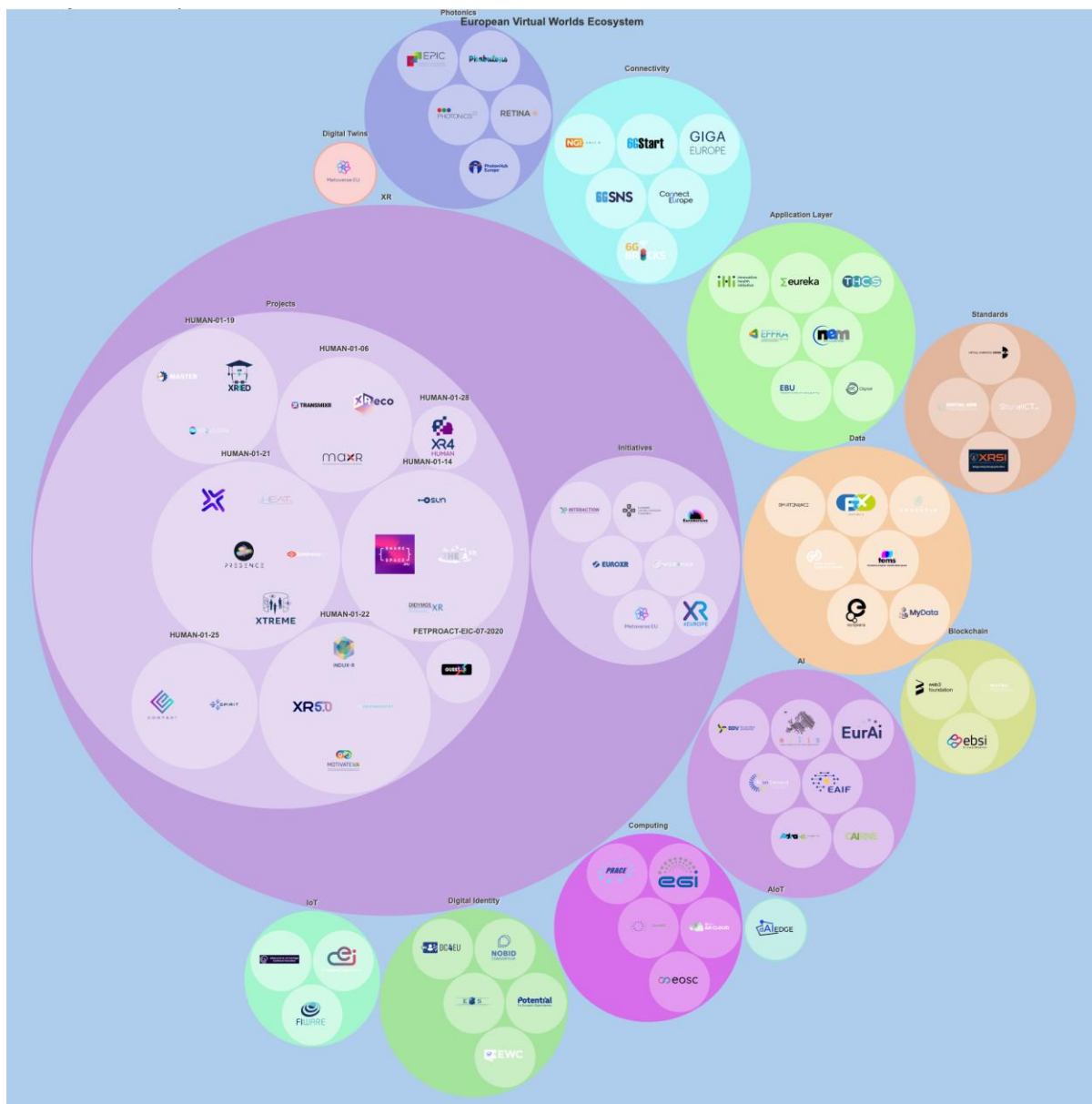


Figure 5 – Static snippet of circle-packing visualisation of EU initiatives

As in the previous solution, the XR field is larger than the other building blocks, since it is the primary building block on which this Task focuses on. Therefore, more stakeholders are being considered for that field (for example, many more EU-funded projects). The image above represents the overview of an interactive visualisation tool that will be online after M19. The image is static, and it is for illustration purposes only.

This is a WP5 asset that will be presented in its final stage in the *Deliverable 5.4 - Report on collaboration with other existing EU initiatives (V2)* at M36.

5 ENGAGEMENT AND PARTICIPATION METHODS

The Task 5.3 started by developing a network of collaborations with the group of pre-selected European initiatives representative of different parts of the ecosystem of core and supportive technologies of virtual worlds. Such a group was called OPENVERSE Ecosystem Task Force (OETF) and was launched on Month 7. After the launch of the OETF and a first internal evaluation of the progress, the Task evolved to be more inclusive in order to ensure a higher participation of EU initiatives, thus maximizing the impact of this Task in support of the OPENVERSE objectives.

The processes leading to the current network of EU stakeholders are explained below in sub-chapters 5.2 and 5.3.

5.1 METHODS SELECTION

Task 5.3 identified a series of methods that could be used for the engagement of stakeholders. Those methods are:

Instruments	Reasoning
One to one meeting	Individual meetings offer a personalised and strategic approach to stakeholder engagement, fostering trust and tailored collaboration. They enable in-depth discussions on priorities, challenges, and potential synergies, making them particularly effective for a first round of engagement. However, while highly valuable for relationship-building, they are resource-intensive and not easily scalable. To maximise impact, these meetings are carefully planned for key stakeholders, with insights documented to inform broader engagement strategies.
Email outreach	Email outreach provides a scalable and cost-effective way to continue engagement, share key information, and invite participation. It allows stakeholders to engage at their convenience, making it an efficient tool for broad communication. However, emails often face low response rates and may be overlooked. For this reason, this method should be employed after the ground for a trusted relationship is laid down through one-to-one meetings. Follow-ups and integration with other methods, such as meetings or workshops, can further enhance impact and response rates.

Workshops	A well-balanced approach combining one-on-one meetings for deep engagement, email outreach for broad communication, and workshops for collective interaction ensures an effective and sustainable stakeholder engagement strategy. • Encouraging active participation: workshops involve hands-on activities, discussions, and group work, which keep participants engaged. • Fostering collaboration and networking: workshops bring people with shared interests together, allowing them to connect, exchange ideas, and build relationships that strengthen the community. • Enhancing knowledge sharing: participants learn from experts and peers, gaining insights from diverse perspectives and experiences. • Creating an inclusive space for discussion: they offer an inclusive environment where people can simultaneously discuss and openly interact. • Encouraging problem-solving: brainstorming and group discussions would help to get solutions to challenges related to the OPENVERSE Technology Framework. • Strengthening community engagement: when people actively participate in workshops, they feel more connected to the community and motivated to contribute and come to the next workshops.
Survey	Provides an approach for efficient data collection from a large number of stakeholders in a short time, and can be distributed easily via email, online forms, or even in-person. They standardised responses for comparisons, identify stakeholder priorities and expectations, and help to determine what matters most to groups of stakeholders (e.g. classified by building blocks). Finally, they are cost cost-effective and scalable: compared to in-person meetings or workshops, surveys are relatively inexpensive and can reach a broad audience, across different geographical locations. The main drawback is that the ecosystem is flooded by surveys from different initiatives and projects and gathering significant statistical inputs is challenging.

5.2 THE OPENVERSE ECOSYSTEM TASK FORCE AND STRATEGIC TECHNOLOGY AGENDA

The initial idea of Task 5.3 was to develop the network of collaborations with the EU initiatives in a closed group. Such group was called OPENVERSE Ecosystem Task Force (OETF) and it was meant to include a selection of the most relevant initiatives and stakeholders across the EU, such as all the H2020

and Horizon Europe projects representing the virtual worlds, such as the XR4HUMAN CSA, the VR/AR Industrial Coalition, IEEE's eXtended Reality Ethics project, the Common European Data Spaces under the Digital Europe Programme, European Partnerships such as AI, Data and Robotics, Space, Photonics, Blockchain, EuroHPC, etc), the Next Generation Internet (NGI) initiative, the European Flagships (Quantum, Graphene), the EU supported digital twins initiatives (such as Destination Earth), Cloud initiatives (e.g SIMPL), AI on Demand, other AI and Data initiatives (e.g Gaia-X, FIWARE, BDVA, IDSA, DSBA, MyData, CLAIRE, ELLIS, etc), the VR/AR Industrial Coalition, 6G SNS, Photonics, the European Blockchain Partnership, and the EUCloudEdgeIoT initiatives, and relevant European standardisation bodies and organisations.

All the initiatives identified were meant to be individually recruited to become part of the OETF, requested to agree to the OETF rules and Terms of Reference and to sign an agreement to become part of such a group. No commitments in terms of time were requested, although a minimum contribution to the OETF activities was expected. Participation in the group was meant to be by invitation-only and managed closely by WP5 members to be a primary source of information for contributing to the content of the Strategic Technology Agenda developed under T5.1.

The work done until M9 consisted of the outline of the strategy, the mapping of the stakeholders following the methodology outlined in Chapter 2 and the engagement of the selected candidates to become part of the OETF. Those were:

NAME	RELATED BUILDING BLOCK / TECHNOLOGICAL AREA	REASON OF ENGAGEMENT
AIOTI	IoT	AIOTI is active on standardisation in virtual worlds and can leverage on the knowledge of its members disseminated across the EU
Data Space for Cultural Heritage (Europeana)	Data	Provide insights on the data-driven innovation landscape, together with detailed knowledge on data spaces (data interoperability, sovereignty and data sharing environments) with a focus on cultural heritage, which is another key application of virtual worlds
EUCloudEdgeIoT	IoT	They provide access to knowledge on the Continuum between cloud, edge and IoT technologies. Moreover, they can activate the knowledge of the many research projects, developers, business users and adopters who are part of their network.
Khronos Group	Standards	The Khronos group was engaged because of its importance in the XR sector and contribution to standards. Despite its focus is world-wide, the Khronos group has a strong presence in Europe (30% of its members are Europe-based).
Metaverse Standards Forum	Standards	They could provide knowledge on interoperability leveraging on a network of 2000+ members, of which almost 1000 are EU-based.

MyData	Data	MyData could provide inputs for the development of ethical and human-centered data sharing for the development of Virtual Worlds.
New European Media (NEM)	Multiple building blocks	NEM will contribute with its knowledge on innovation trends in the new media sector, which is a sector on which Virtual Worlds will have a strong impact.
OpenARCloud	Computing	OpenAR Cloud is an association which has a branch in Europe, with whom OPENVERSE will collaborate. They have been engaged because of their work on interoperability on spatial computing technology, data and standards to connect physical and digital worlds.
Web3Foundation	Distributed ledger - blockchain	They provide access to knowledge on blockchains and decentralisation/web 3.0 They are headquartered in CH but have a strong focus on EU market and focus on values such as human-centricity, sovereignty and control of personal data which are matching EU values.

Table 1 – Members of the OETF at M9

Next to the list of officially recognized members of the OETF, there was a list of organisations that were in the process of signing and officially entering the Task Force. Those were:

NAME	RELATED BUILDING BLOCK / TECHNOLOGICAL AREA	REASON OF ENGAGEMENT
6G-SNS (6G-SmartNetworks)	Connectivity / Infrastructure	Provide input to connectivity and network requirements for enabling the uptake of virtual worlds by the users.
AI on-demand platform (AloD)	AI	The AloD platform could provide inputs on the state of the art of AI research and innovation and how AI technologies can be employed in virtual worlds.
Connect Europe (former ETNO)	Connectivity / Infrastructure	Important for receiving feedback from the telecommunication sector.

CORTEX ²	Extended Reality	EU project that could provide insights on specific use cases, such as the employment of XR technologies in the work environment
Data Spaces Support Centre (DSSC)	Data	The DSSC consortium brings together some of the most prominent EU data space initiative, such as Gaia-X, FIWARE, BDVA, IDSA and MyData. They could provide knowledge on data sovereignty, interoperability and data sharing environments (DSSC's Blueprint).
Destination Earth - Data Lake	Digital Twins	This initiative can provide an interesting use case on exploitation of digital twins in virtual worlds, with inputs also on data sharing and interoperability
Destination Earth - Digital Twins	Digital Twins	This initiative could provide an interesting use case on exploitation of digital twins in virtual worlds, with inputs also on data sharing and interoperability
EUROHPC Joint Undertaking (Research and Innovation Advisory Group / Infrastructure Advisory Group)	Computing	Link to EuroHPC infrastructure and AI Factories.
European Broadcasting Union (EBU)	Multiple Building Blocks	EBU is a very large organisation and could provide inputs on the latest trends of virtual worlds technologies uptake by the public service media organisations in Europe.
GSM Association	Connectivity / Infrastructure	GSMA could provide input to the on connectivity with a focus on mobile. They have a strong focus on the EU market.

SERMAS	Extended Reality	EU project that could provide insights on socially-acceptable design in the XR field, as well as provide access to startups and funded projects via their cascading funds
TEMS - Media Data Space	Data	Provide insights on the data-driven media landscape, together with detailed knowledge on data spaces (data interoperability, sovereignty and data sharing environments) with a focus on media, which is a key application of virtual worlds .
VOXReality	Extended Reality	EU project that could provide insights on voice-driven interaction, Natural Language Processing (NLP) and Computer Vision (CV) technologies in the Extended Reality field
XR4HUMAN	Extended reality	Engaging XR4Human is paramount as it is a CSA funded under the same scheme as OPENVERSE and it is striving to achieve complementary objectives to the ones of OPENVERSE.
XReco	Extended Reality	EU project that could provide insights on content creation, ethical business modelling and (new) media

Table 2 - organisations that were in the process of signing and officially entering the OETF at M9

The stakeholders that officially signed the agreement, were asked to provide their logo to be added to the dedicated webpage on the OPENVERSE website created with the collaboration of WP4.

The mapping activities and the first round of engagement led to the organisation of a first workshop for the launch of the OETF on 30 April 2024. The workshop and its outcomes are reported in detail in section 6.1.1.

5.3 FROM THE OETF TO THE NETWORK OF STAKEHOLDERS OF EU INITIATIVES

The ideas of the OETF and of the Strategic Technology Agenda were brought forward until M9, when the project reconsidered part of its strategy and a decision was taken to reform the OETF and repurpose the Strategic Agenda. As outlined in the amendment of February 2025,⁴ the OETF was put aside to the benefit of a more accessible group, with lower entry barriers and the possibility for more stakeholders to enter. The OETF risked being seen as a closed, exclusive, group. In substitution to that, the new network of stakeholders was created, including the members of the former OETF and new organisations and initiatives that were identified following the same strategy and methodology as before, with the only difference being that organisations did not have to sign any document to enter the group nor agree to any Terms of Reference. The Strategic Technology Agenda was repurposed, and its name changed into OPENVERSE Technology Framework to avoid any confusion to the external audience regarding the Strategic Agenda that will be developed by the Public-Private Partnership on Virtual Worlds.

It is important to remark that most of the former members of the OETF, and the ones that were in the process to enter it, automatically switched to the new network of stakeholders, hence not having any impact on their collaboration status and modalities with the OPENVERSE project. It is important to remark, however, that this applied only to those stakeholders that were proven to be European. All the other ones, like the Metaverse Standards Forum or the Khronos Group, were moved into the engagement work performed under *T5.4 - Support international collaboration with relevant Global initiatives on Virtual Worlds*. The organisations were informed with a detailed explanation, and no negative feedback was received.

As of M9, WP5 and T5.3 continued the work started for the OETF outlined in Chapter 3 with the updated strategy of ensuring a more open network of stakeholders. The engagement strategy continued along the points outlined under Chapter 2, whereas the methodology was slightly modified in order to increase systematically the number of representatives for each building block and ensure equal representation of each area.

In detail, the changes to the methodology were the following:

- Engage 4 organisations for each building block
- Remove the need of signing an agreement to the Terms of Reference of the former OETF
- Engage the organisations for the co-creation of the OPENVERSE Technology Framework, instead of the Strategic Technology Agenda

Based on the changes and the updated methodology, the project ramped up the engagement of the initiatives, reaching a full coverage of the building blocks. In detail, by M18 the project:

- Identified and mapped 65 EU initiatives and 51 EU-funded projects on XR
- Engaged all the 65 EU initiatives to present the project and the co-creation of the OPENVERSE Technology Framework

⁴ Amendment - AMD-101135701-10 (01 February 2025)

- Organised 3 invitation-only workshops with more than 80 participants (exclusive of OPENVERSE participants) and 53 organisations represented



6 RELATIONSHIP MANAGEMENT AND TRUST BUILDING

Achieving the objectives requires a mindset focused on sustaining the established community. Therefore, the synergies and collaboration fostered by this Task follow a methodology designed to ensure long-term engagement among participants.

By defining a clear purpose and the shared goal of the adoption of Virtual Worlds that are open, accessible, ethical, and aligned with EU values, stakeholders remain engaged over time. The EU initiatives and projects engaged are also encouraged to actively contribute, share insights, and take part in co-creation activities, strengthening their sense of ownership and long-term commitment.

Relationship management within these projects involves fostering synergies between different initiatives, encouraging knowledge-sharing, and facilitating cross-sector collaboration among the representatives of the different technological areas. co-creation activities empower stakeholders by giving them an active role in shaping the direction of Virtual Worlds, reinforcing their commitment to shared objectives. This engagement is further reinforced through recurring events, workshops and collaborative platforms.

Many of those activities started at WP5 and are planned beyond M18 to sustain momentum. Moreover, with the growing maturity of the OPENVERSE project, the engagement of those initiatives will step up opening to different activities and hooking those to the project's assets, such as the opportunities offered by the Observatory. In this sense, the relationship management and the trust building are reinforced by the participation in many of the activities of the projects and are supported by several OPENVERSE's Work Packages. Lastly, all stakeholder activities are proposed when considered value-driven, ensuring tangible benefits such as exclusive insights, learning opportunities, networking opportunities, or connections with EU policymakers.

6.1 WORKSHOPS

Workshops are valuable for community building and information sharing because they provide an interactive and engaging environment where participants can collaborate, learn, and grow together.

Those serve the purpose of closely collaborate and build synergies with other existing related European Initiatives, while addressing the specific project objectives OO7 and OO8 listed in Chapter 2. In the context of supporting the objectives of WP5 and, at large, OPENVERSE, the workshops were particularly useful for facilitating knowledge exchange and meaningful interactions, as workshops play a key role in strengthening communities and promoting collective growth.

Next, the images of the different workshops organised within WP5 in OPENVERSE.

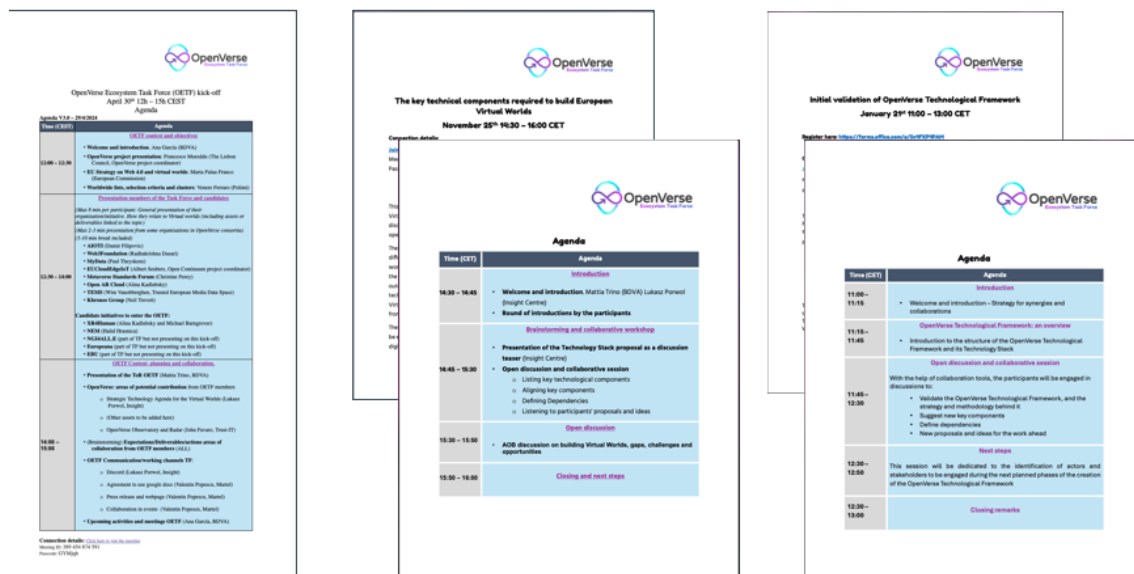


Figure 6 - Agendas of the workshops organised by WP5

6.1.1 OPENVERSE Ecosystem Task Force (OETF) kick-off

After the first round of engagement, OPENVERSE, under the lead of T5.3, organised a first work for the launch of the OETF on 30th April 2024, online. The 3-hour meeting was organised to launch the OPENVERSE Ecosystem Task Force. Among the key messages, the consortium presented its ambition of supporting the operationalisation of the European Strategy on Virtual Worlds, ensuring that the stakeholders get that holistic perspective needed to align and embrace the different communities, initiatives and programme working on Virtual Worlds.

The workshop saw the participation of the Project Coordinator, as well as the Project Officer of the European Commission, who with their introductory speech, gave an important overview of the OPENVERSE project and the EU strategy on Web4.0 and virtual worlds.

After this, the organisations that at the time were already officially members of the OETF, presented their work and how, each of those could contribute to the project and more in general the development of open, transparent and inclusive virtual worlds from the perspective of their technological area(s). Those organisations were the following:

- AIOTI
- Web3Foundation
- MyData
- EUCloudEdgeIoT
- Metaverse Standards Forum
- Open AR Cloud
- Khronos Group

Followed by candidate organisations to enter the OETF:

- XR4HUMAN
- NEM
- TEMS

- EBU

Among the participants, there were also other candidate member who preferred not to present. Those were NGI4ALL.E and Europeana (Data Space for Cultural Heritage).

After the round of presentations, which served to set the ground for collaboration among the different participants and frame the areas and topics on which each one of them could contribute on, the organisers presented the areas on which the OPENVERSE project may need inputs. First and foremost, a preliminary structure of the Strategic Technology Agenda (now OPENVERSE Technology Framework) was presented.

After this important part, which was mainly linked to the main objective of the OETF, the workshop served to introduce other parts of the project. This demonstrated the good synergies set with the other WPs and Tasks for the project. The participants were therefore introduced to the definition and analysis of Virtual Worlds performed by WP1 (presented by POLIMI), the OPENVERSE Observatory and Radar developed by WP6 (presented by Trust-IT) and the communication channels and assets (i.e. the creation of a Discord channel for more efficient communication with the community as well as a press release announcing the group and a webpage) developed by WP4 and presented by Martel.

6.1.2 Workshop: The key technical components required to build European Virtual Worlds

This workshop was organised online on 25th November 2024. It was aimed at showing the first structure of the Technology Stack for building European Virtual Worlds developed by the OPENVERSE project's *T5.1 - Technological synergies* and engage the participants in an active discussion on the key technical components required for building Virtual Worlds that are open, transparent, inclusive, and respectful of ethical and environmental requirements.

The invited participants were EU initiatives identified by OPENVERSE, including the former OETF members and new members recruited since the previous workshop at the end of M7. The participants were experts coming from different domains and covering most of the technical areas of Virtual Worlds. During the workshop, the group worked to identify gaps and suggest key topics with the aim of starting the co-creation of the OPENVERSE Technology Framework and provide a first contribution to the technological requirements, gaps, challenges and opportunities for the creation of European Virtual Worlds.

The key technical components that were assessed during the workshop were Extended Reality, AI, Blockchain, Connectivity, data spaces, cloud, continuum computing, digital twins, Identity management, and microelectronics.



Figure 7 – screenshot from the workshop on the key technical components required to build European Virtual Worlds

The workshop was invitation-only and saw the following participants:

- OpenAR Cloud
- CErTH-ITI
- AIOTI
- NEM
- EBU
- Europeana (Data Space on Cultural Heritage)
- Data Spaces Support Centre
- Web3Foundation
- TEMS (Media Data Space – Trial 8)
- Connect Europe

The outcomes of the workshop highlighted the key technologies for Virtual Worlds, emphasizing the importance of connectivity, AI, computing power, and digital twins. Challenges include infrastructure limitations, computing demands, data interoperability, and lack of standards in XR and blockchain. Participants also noted issues like security, privacy, and skill shortages. Overall, the participants agreed that opportunities exist in Europe, and that there is a strong leadership in standardisation, digital

identity development, and real-time experiences. However, better coordination and innovation support are needed and are essential for overcoming obstacles and international competition for the advancement and uptake of Virtual Worlds.

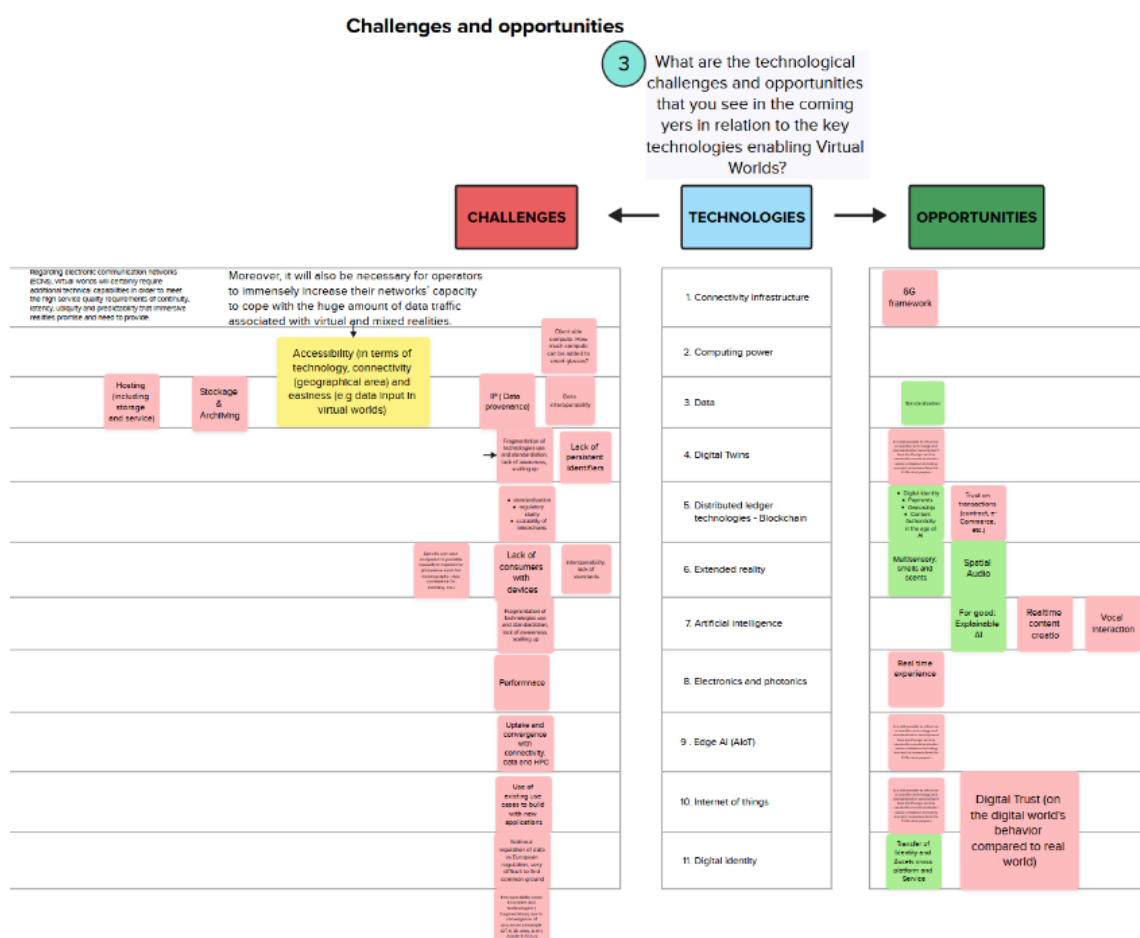


Figure 8 – screenshot 2 from the workshop on the key technical components required to build European Virtual Worlds

The workshop successfully initiated a vital conversation on the technical components needed to build Virtual Worlds that reflect European values and priorities. By leveraging the collective expertise of participants, the event advanced the objective of paving the ground for future workshops with specific topics to address the gaps identified.

6.1.3 Workshop: Initial validation of OPENVERSE Technology Framework

This workshop was organised on 21st January 2025, online. The workshop aimed to initiate the definition of the OPENVERSE Technological Framework, incorporating insights from experts in XR, AI, Computing, IoT, Connectivity, Blockchain, and other building blocks. Only the organisations listed in the list of networks of stakeholders under EU initiatives (see Annex 1), and some selected EU projects were invited as participants. The selected EU projects were:

- POPULAR
- XR2Industry
- CORTEX2
- SERMAS

- VOXReality

Those were invited to contribute to shaping this framework through collaborative discussions and knowledge exchange.

The session focused on three key goals:

- Validating the structure, progress, and building blocks of the OPENVERSE Technological Framework, including generic case studies.
- Understanding how various organizations and EU projects can contribute to its definition.
- Identifying common challenges and alignment needs across different technological areas.

At the beginning of the workshop, the participants were introduced to the latest structure of the OPENVERSE Technological Framework:

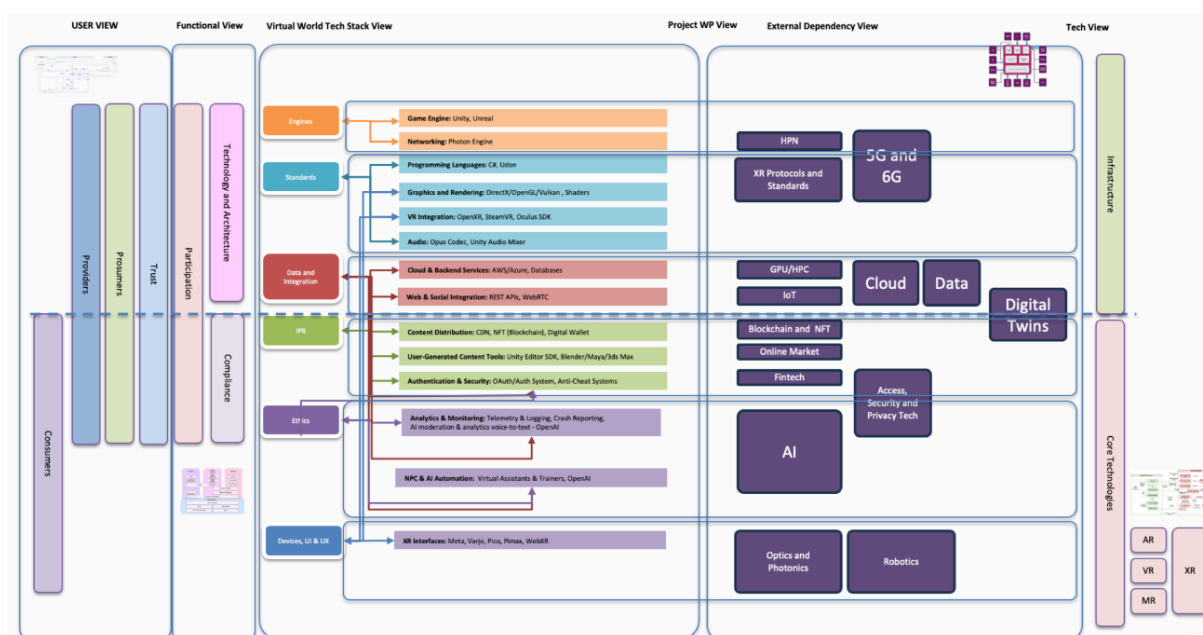


Figure 9 – Structure of the OPENVERSE Technological Framework at M15

After that, the participants were engaged in an interactive session. The discussions highlighted experiences with the adoption of Virtual Worlds technologies, emphasising the need for openness, transparency, inclusivity, and ethical considerations.

Of particular interest was the creation of an interactive matrix for the aligning stakeholders' interest (consumers, prosumers, and producers) to specific technology layers, as well as ranking the layers of technologies in terms of importance for creating Virtual Worlds (snippet reported hereby below).



Figure 10 – Screenshot from the workshop on initial validation of OPENVERSE Technological Framework

This exercise gave good insights on how each of the participants sees the importance of the different areas, how those interact, and how each technology area is important for the different types of stakeholders (consumers, prosumers, and producers). Remarkably, the participants noted that connectivity, Digital Twins and assets management are key to link Virtual Worlds development to the real-world use cases, for example in the industrial and healthcare domain. Moreover, it was underlined how security and identity wallets are needed for ensuring privacy and robustness of the systems as well as the importance of ensuring the sovereignty of the technologies as to ensure that the whole stack is abiding to the EU rules and principles.

Some constructive criticisms were shared, such as that the Technology Framework needs to be redefined according to the specific sector of application and that it is important to reflect on the market and the sectors on which Virtual Worlds will apply.

- **Contextual Redefinition:** The framework should not be static or monolithic. It must be **redefined and adapted** according to the **specific application domains** (e.g., education, manufacturing, healthcare, creative industries).
- **Sector-Specific Marketability:** There's a need to **evaluate market readiness and relevance** of tools and technologies across sectors. Not all layers will carry the same weight across domains, and some may require custom integrations.
- **Balancing Industry and Public Priorities:** While industry actors may place higher importance on tools like NFTs or monetisation platforms, these should be **cross-referenced** with **public values, societal impact goals, and EU priorities**.

This will help understanding the marketability of certain tools. Moreover, the participants underlined that despite some priorities from companies being deemed as high relevance, those are still individual and should be cross-referenced with national and EU priorities. In fact, it is important to consider EU regulation, as well as international standards and metrics that are relevant for the EU.

Finally, the participants acknowledged that the European Union has a good standing on the following technologies: computing power/ cloud; AI; Data; Interoperability and standards; Open-source decentralised components; Ethics and privacy; Networks (5G and 6G) as well as Cloud to Edge technologies; and 3D content creation.

In sum, the workshop fostered a good collaboration and knowledge sharing, laying the groundwork for a well-defined and cohesive OPENVERSE Technological Framework that addresses critical technological and strategic challenges.

6.2 INTEREST CLUSTERING – SURVEYING ACTIVITIES

A survey was created complementary to bilateral meetings during M16 with the aim to gather knowledge on the different priorities, instruments, challenges on Virtual Worlds at the EU level. It was made by the participants to T5.3 and it will be shared after M18. The results will be reported in D5.4.

The survey targets EU industrial initiatives, associations, no-profit organisations and EU projects addressing the different Virtual World building blocks, whose outcomes have an impact (or are expected to have an impact) at the European level. Moreover, the respondents are asked different questions to understand the importance of different technologies in relation to Virtual Worlds, to get information on existing frameworks and standards, and to identify challenges, opportunities and dependencies of Virtual Worlds. Specifically, those questions refer to:

- Ranking the different technological areas/building blocks identified under Chapter 3 in accordance with the importance of those to enable Virtual Worlds
- Which technologies are considered pivotal for implementing Virtual Worlds in the near future
- What kind of frameworks or standards are used or deemed important in the development of Virtual Worlds
- What challenges are envisaged in the adoption of Virtual Worlds in Europe
- Are there any specific technological or socio-technical gaps that hinder the uptake of Virtual Worlds in Europe?
- What are the opportunities for the adoption of Virtual Worlds in Europe
- Are there any specific dependencies and interconnections between Virtual World technologies?
- How much can one rely on the EU Virtual World technologies ecosystem
- What technologies are missing and must be imported in order to facilitate developments in the EU
- Is there a need for technological harmonization between any of the important EU tech players?

7 NEXT STEPS AND CONCLUSIONS

To effectively engage stakeholders and strengthen the ecosystem around XR, a structured and action-oriented strategy is essential. T5.3 approach focuses on identifying, analysing, and consolidating the collaborations created thus far, and deepen the synergies with such EU stakeholders.

While stakeholder engagement is crucial for the success of this Task and the project, it also presents several risks that must be carefully managed. The Task has also identified the following risks:

Conflicting interests and priorities	Stakeholders from different sectors (governments, industry, academia, and civil society) and technological areas may have divergent goals and expectations. These differences can lead to misalignment, slowing down decision-making and progress.
Lack of long-term commitment	Engagement can wane over time if stakeholders do not perceive continuous value in their participation.
Overrepresentation of certain groups	Some stakeholders, such as large corporations or well-funded organizations, may dominate discussions, marginalizing smaller players like startups, researchers, or civil society groups.
Trust issues	Unclear communication can erode trust among stakeholders.
Coordination Challenges	Managing a diverse group of stakeholders across different regions and industries can be complex. Miscommunication, and cultural differences can hinder collaboration.

Table 3 – list of identified risks

To mitigate these risks, T5.3 has outlined a strategy to move forward based on the following principles:

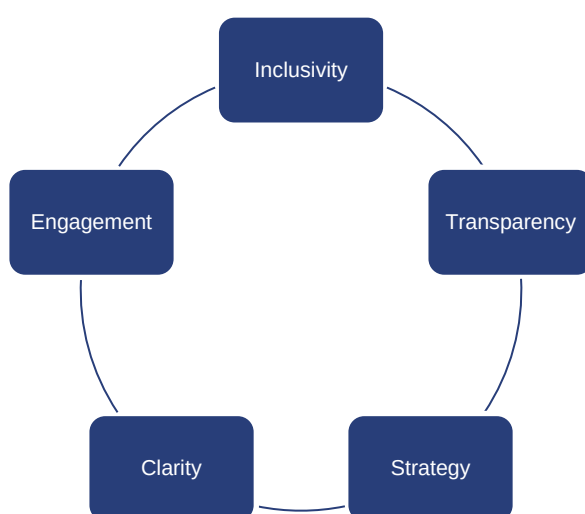


Figure 11 – principles guiding the strategy ahead

- **Inclusivity:** move from the OETF to a more open network of EU stakeholders and ensure a participation with balanced representation.

- Transparency: Ensure transparency in the organisation of the meetings and the purpose of the work (e.g. for the co-creation of the OPENVERSE Technological Framework).
- Strategy: Provide clear incentives and benefits for long-term engagement.
- Clarity: Establish structured communication channels for ongoing dialogue.
- Engagement: Promote co-creation and active stakeholder involvement in shaping outcomes.

Those principles will be rolled out by acting on two lines, one focusing on the external relations to the projects and one to the internal.

External line of actions	Internal line of actions
Consolidating the mapping of XR-related projects, their pilots and best practices	Identify the key assets of the project to which the network of EU stakeholders can contribute to. For example, collaborating with WP1 on providing experts for the <i>T1.2 Calls for participation in the co-creation activities</i> or by providing use cases to be included in the Observatory created under <i>T6.3 Development of the project observatory</i> .
Assessing the presence of XR in the roadmaps of the EU initiatives that have been engaged	Identify the key assets of the project that the network of EU stakeholders can exploit. For example, by understanding how to navigate the searchable project observatory, the OPENVERSE watch, and taxonomy.
Analysing strategic agendas and roadmaps of associations, platforms, and Public-Private Partnerships (PPPs) to identify synergies and gaps in XR adoption.	Collaborate with WP4 to engage the network of EU stakeholders in OPENVERSE's events
Consolidating best practices and networks within an observatory and other assets of the project ensuring greater visibility, improved information flow, and increased engagement with relevant stakeholders	

Table 4 – plan of activities for the next months of T5.3

By implementing these actions, T5.3 aims to engage the network of EU stakeholders with broader purposes, in support of retaining the members of the group created, creating a cohesive and informed group. Moreover, it will offer a platform between external organisations and the key assets of the project, thus promoting its sustainability. This will be done seamless and gradually, to ensure a natural evolution of the interest of the EU initiatives and projects towards OPENVERSE's activities.

Also, the plan will leverage on the management of the relationship with the initiatives engaged by taking into account the group's interests and needs. As said, the above steps will be dedicated to

growing the trust of the community towards the project, and increase the interest in exploiting OPENVERSE's assets, thus enhancing their sustainability.



1 ANNEX 1 – LIST OF ENGAGED EU INITIATIVES

The following table lists all the EU-based initiatives that have been contacted at least once by T5.3 and that are considered to be part of the OPENVERSE network of EU stakeholders.

STAKEHOLDER NAME	FULL NAME	STAKEHOLDER TYPE	VIRTUAL WORLD BB
DeployAI	AI on Demand deployment	EU project (not XR)	AI
EAIF	European AI Forum	Non-profit organisation	AI
Adra-e		Non-profit organisation	AI
DFKI	German Research Centre on AI	Research centre	AI
ELLIS		Non-profit organisation	AI
BDVA	Big Data Value Association	Non-profit organisation	AI
EurAI		Non-profit organisation	AI

Cairne		Non-profit organisation	AI
EUROHPC JU (RIAG / INFRAG)	EuroHPC Joint Undertaking	Joint Undertaking	Computing
Open AR Cloud		Non-profit organisation	Computing
EOSC	European Open Science Cloud (EOSC) Partnership	Public-Private Partnership	Computing
6G-SNS	6G Smart Networks	Public-Private Partnership	Connectivity/Infrastructure
Connect Europe (former ETNO)		Non-profit organisation	Connectivity/Infrastructure
6G-BRICKS	Building Reusable testbed Infrastructures	EU project (not XR)	Connectivity/Infrastructure
NGI4ALL.E	Next Generation Internet for All Evolution	EU project (not XR)	Connectivity/Infrastructure
GigaEurope aisbl		Non-profit organisation	Connectivity/Infrastructure

DSSC	Data Spaces Support Centre	EU project (not XR)	Data
TEMS	Media Data Space	EU project (not XR)	Data
DCHE - Europeana	common European data space for cultural heritage	EU project (not XR)	Data
MyData		Non-profit organisation	Data
DestinE - Digital Twin (ECMWF)		EU project (not XR)	Digital Twins

DestinE - Data Lake		EU project (not XR)	Digital Twins
Web3 Foundation		Non-profit organisation	Distributed ledger - Blockchain
INATBA	International Association for Trusted Blockchain Applications	Non-profit organisation	Distributed ledger - Blockchain
EBSI (Europeum EDIC)	European Blockchain Services Infrastructure (Europeum EDIC)	EU initiative	Distributed ledger - Blockchain

Photonics21	European Photonics Platform	Public-Private Partnership	Electronics/photonics
Fraunhofer Institute for Photonic Microsystems IPMS		Research centre	Electronics/photonics
EuroXR Association		Non-profit organisation	Extended Reality
Foundation Metaverse Europe		Think Tank	Extended Reality
EGDF	European Games Developer federation	Non-profit organisation	Extended Reality
XR interaction		Non-profit organisation	Extended Reality
Metaverse EU		Non-profit organisation	Extended Reality
AIOTI		Non-profit organisation	IoT

EUCloudEdgeIoT		EU initiative	IoT
NEM	New European Media	Non-profit organisation	Multiple BBs
EBU		Non-profit organisation	Multiple BBs
Eureka	European Partnerships Innovative SMEs	Public-Private Partnership	Multiple BBs
EIT DIGITAL	European Institute of Technology - Digital	Public-Private Partnership	Multiple BBs
EIT Health	European Institute of Technology - Health	Public-Private Partnership	Multiple BBs
EIT Manufacturing	European Institute of Technology - Manufacturing	Public-Private Partnership	Multiple BBs
EIT Urban Mobility	European Institute of Technology - Urban mobility	Public-Private Partnership	Multiple BBs
EIT Cultural and Creative Industries	European Institute of Technology - Cultural and Creative Industries	Public-Private Partnership	Multiple BBs
EFFRA	European Partnership Made in Europe	Public-Private Partnership	Multiple BBs
IHI JU	Innovative Health Initiative Joint Undertaking	Public-Private Partnership	Multiple BBs

StandICT	ICT Standardisation Observatory and Support Facility in Europe	EU project (not XR)	Standards
XRSI Europe	X Reality Safety Intelligence Europe	Non-profit organisation	Standards
dAIEDGE		EU project (not XR)	Edge AI (AIoT)
PRACE		Non-profit organisation	Computing
EGI		Non-profit organisation	Computing
Manufacturing X		EU project (not XR)	Data
Tourism Data Space		EU project (not XR)	Data
EOS	European Organisation for Security	Non-profit organisation	Digital Identity
Potential	Pilots for European Digital Identity Wallet	EU project (not XR)	Digital Identity
EWC	EU Digital Wallet Consortium	EU project (not XR)	Digital Identity
NOBID		EU project (not XR)	Digital Identity
DC4EU	Digital Credentials for Europe	EU project (not XR)	Digital Identity
SM4RTENANCE		EU project (not XR)	Data

UNDERPIN		EU project (not XR)	Data
Epic Photonics		Non-profit organisation	Electronics/photonics
Phaboulous Pilot Line		EU project (not XR)	Electronics/photonics
PhotonHub Europe		R&I organisation	Electronics/photonics
Retina		EU project (not XR)	Electronics/photonics
FIWARE		Non-profit organisation	IoT
Virtual Dimension Centre - Fellbach		Research centre	Standards
Metabrake		EU project (not XR)	Digital Twins
Flanders Make		Research centre	Extended Reality

2 ANNEX 2 – LIST OF IDENTIFIED EU PROJECTS ON XR

The following table lists all the EU projects identified on XR. Not all have been yet engaged, although those will all be contacted before the end of the project according to the strategy outlined in this Deliverable.

ACRONYM	FULL NAME
MASTER	Mixed reality ecosystem for teaching robotics in manufacturing
SHARESPACE	Enriching social interaction in shared hybrid spaces
THEIA-XR	Extended reality technologies for improved workplace efficiency
DIDYMOS-XR	Better digital twins to drive the future of cities and industries
SUN	Lifelike social environments in extended reality
XR4ED	eXtended Reality for Education
XR2Learn	Immersive technologies for entrancing learning experiences
TrustChain	Building an efficient and safe internet of the future
FLUAR	FLUAR - A novel solution for fluorescence-guided surgery based on augmented reality
XR5.0	Human-Centric AI-Enabled Extended Reality Applications for the Industry 5.0 Era

WATERLINE	Creating a digital water alliance in Europe
TransMIXR	Collaborative immersive media experience creation and consumption through social XR
PRESENCE	A toolset for hyper-realistic and XR-based human-human and human-machine interactions
XR4Human	Establishing the European standards for extended reality
MAX-R	New software for extended reality productions
BrainCode	Brain-inspired Intelligence for Semantic Video Compression
LUMINOUS	Language Augmentation for Humanverse
GuestXR	Innovation for immersive interaction with positive social results
VERGE	Edge computing evolution
XTREME	Breaking boundaries in art and music
Meetween	My Personal AI Mediator for Virtual MEETtings BetWEEN People
HEAT	Hybrid Extended reAliTy
POPULAR	Augmented reality in the European eyewear industry
AI4WORK	Human-centric Digital Twin Approaches to Trustworthy AI and Robotics for Improved Working Conditions

XR2Industry	Tailoring eXtended Reality to Industry's needs
MOTIVATE XR	Maintenance, Support & Operation Training using Immersive Virtual and Augmented Technology for Efficiency with XR
INDUX-R	Transforming European Industrial Ecosystems through eXtended Reality enhanced with human-centric AI and secure, 5G-enabled IoT
XReco	XR mEdia eCOsystem
6G-XR	6G eXperimental Research infrastructure to enable next-generation XR services
HXR	Holographic eXtended Reality (HXR) for true Augmented Reality (AR) and lifelike immersive displays
ASP-belong	Augmented Social Play (ASP): smartphone-enabled group psychotherapeutic interventions that boost adolescent mental health by supporting real-world connection and sense of belonging
CORTEX2	COoperative Real-Time EXperiences with EXtended reality
SONICOM	Transforming auditory-based social interaction and communication in AR/VR
SPIRIT	Scalable Platform for Innovations on Real-time Immersive Telepresence
GuestXR	GuestXR: A Machine Learning Agent for Social Harmony in eXtended Reality
CAPHE	Communities and Artistic Participation in Hybrid Environment
AVATAR	Unlocking the Power of Medical Images for Surgeons

NANOVR	Nanoscale Design using Virtual Reality
B-prepared	Building PREPAREDness with Collaborative Knowledge Platform, Gamification and Serious Game in Virtual Reality
NEPTUN	New approach to innovative technologies in manufacturing
e-DIPLOMA	Electronic, Didactic and Innovative Platform for Learning based On Multimedia Assets
CyberSecDome	An innovative Virtual Reality based intrusion detection, incident investigation and response approach for enhancing the resilience, security, privacy and accountability of complex and heterogeneous digital systems and infrastructures
EXPERIENCE	The “Extended-Personal Reality”: augmented recording and transmission of virtual senses through artificial-IntelligENCE
MEMENTOES	iMmersive gamEs for Museums as vehicles to Engage visiTOrs in Empathetic reSponses
EO4EU	AI-augmented ecosystem for Earth Observation data accessibility with Extended reality User Interfaces for Service and data exploitation
CREATIVR	Creativity in Virtual Reality
ADVHANDTURE	Computational Design of Multimodal Tactile Feedback within Immersive Environments
TIMELAPSE	TIMELAPSE. A VR application for speeding up time passage during chemotherapy
AccessVR	Developing Experience-Centric Accessible Immersive Virtual Reality Technology
SERMAS	SOCIALLY-ACCEPTABLE EXTENDED REALITY MODELS AND SYSTEMS

VOXReality	Voice-driven interaction in XR spaces
MuseIT	Multisensory, User-centred, Shared cultural Experiences through Interactive Technologies
MEMORISE	Virtualisation and Multimodal Exploration of Heritage on Nazi Persecution
MEMENTOES	iMmersive gamEs for Museums as vehicles to Engage visiTOrs in Empathetic reSponses
PERCEIVE	Perceptive Enhanced Realities of Colored collEctions through AI and Virtual Experiences
ELLIE	On the UsE of Internet of Senses for the CuLturaL HeritagE
ChemiNova	Novel technologies for on-site and remote collaborative enriched monitoring to detect structural and chemical damages in cultural heritage assets
i-Game	Building a community for the co-creation of games with high impact on innovation, sustainability, social cohesion and growth
IMPULSE	IMmersive digitisation: uPcycling cULTural heritage towards new reviving StratEgies
REVIVE	Community-centred language REVitalisation powered by heritage-led storytelling and digital innoVation in Europe
INT-ACT	Intangible Cultural Heritage, Bridging the Past, Present, and Future
LoGaCulture	Locative Games for Cultural Heritage
Artcast4D	Artcast4D: Unleashing creativity!

AMPLIFY	PHYGITAL SOLUTIONS FOR THE CULTURAL AND CREATIVE INDUSTRIES
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