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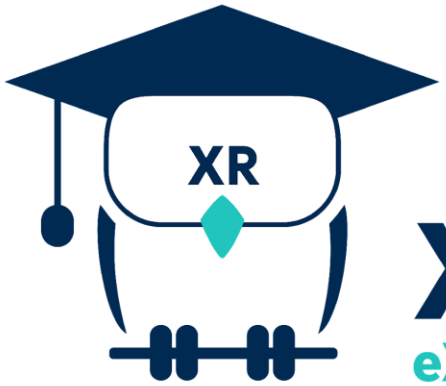

XR4ED
eXtended Reality for EDucation

D1.3 Quality Plan and Risk Management - 2

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XR4ED Project Profile

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Partners

CYENS CENTRE OF EXCELLENCE	CYENS	RESEARCH	CYPRUS
konnektable TECHNOLOGIES	KONNEKTABLE	SME	IRELAND
21 Sci science 27 Co communication	SciCo	SME	GREECE
F6S	F6S	SME	IRELAND
INFINITIVITY DESIGN LABS	Infinity Design Labs	SME	FRANCE
KAINOTOMIA	KAINOTOMIA	SME	GREECE
NUROGAMES	NUROGAMES	SME	GERMANY
CRI	CRI	INDUSTRY	Luxemburg
SIMAVI	Software Imagination & Vision SRL	SME	ROMANIA
UPC	Universitat Politecnica de Catalunya	RESEARCH	SPAIN
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List of acronyms

Acronym	Description
XR4ED	Extended Reality for Education
XR	Extended Reality
FSTP	Financial Support for Third Parties

Executive summary

The **D1.3 - Quality Plan and Risk Management - 2** is a live document that outlines the quality objectives, the tools and methodology used for quality assurance for the XR4ED FSTP projects' management and successful implementation. A list of risks —as they were identified at the proposal stage but also new risks that were identified by the Consortium during the project's early stages, including the Project Review meeting on M09, as well as all the Contractual agreements for each third-party project that received funding, prepared by the Coordinator on M16— that could potentially jeopardize the project's results, accompanied by their corresponding mitigation measures were included.

Quality objectives, tools, and methodology implemented for ensuring the compliance with the quality standards and based on the requirements defined within the context of the XR4ED project —both the project management/implementation of the twenty (20) funded projects and the XR4ED project product (XR4ED Platform, Marketplace)— have already been covered in the Contractual Agreements prepared by the Coordinator (D1.8 – Contract Preparation for the FSTP projects).

1 Introduction

The European EdTech sector is playing an increasingly important role in driving forward digital transformation in Europe covering all education and training sectors. According to estimates, the sector saw a 15% increase in investments in 2021 and global investments are expected to reach over $87 billion in the upcoming decade. Notwithstanding, the sector is heavily fragmented across the European Union with many small players and few companies playing a global role.

The European XR industry has evolved and maintained a leading role globally in software and content production. The use of XR can expand the range of activities through which students can gain hands-on experience, enabling them to go beyond abstract knowledge and supporting skills-based teaching and learning. Currently, developing XR applications for education requires specialized knowledge and strong XR development skills. The process takes a lot of effort, time, and money.

The XR4ED concept is to:

a) bring together EdTech and XR community and resources, overcoming fragmentation issues and encouraging the acceleration of innovation for personalized, innovative, efficient, and inclusive learning using XR;

b) build a one-stop shop and open marketplace for XR applications for learning, training and education that will act as a European reference platform on learning and teaching with XR4ED will focus on the following sectors which must be further developed to make Europe a leader in cutting-edge technologies for education:

- Boost the deployment of innovative XR applications for learning, training, and education.
- Enable digital start-ups, small and medium-sized enterprises (SMEs), and industry active in the EdTech sector to further advance early prototypes, of digital learning solutions/apps using XR to a market-ready product.
- Provide a single point of access to XR content, tools and solutions based on open standards.
- Provide links to existing relevant initiatives and projects, including existing platforms, catalogues, or repositories.

1.1. Introduction of Risks and Quality Plan

All the actions of XR4ED are implemented towards the successful development, launch, and maintenance of the XR4ED platform. To ensure a high level of quality in the actions —such as Reports, Surveys, and

Dissemination activities already described in the proposal— XR4ED's consortium has developed and continuously maintains a comprehensive risk assessment and contingency plan. This plan identifies potential risks and outlines corresponding mitigation measures to address them effectively. Due to the fast-evolving landscape of XR technologies, the project's success heavily relies on the quick adaptation of the XR4ED consortium to the new directions of global XR ecosystem. The plan is frequently updated, throughout the project's duration, to accommodate all emerging issues.

The present document outlines the Quality Plan and Risk management for the twenty (20) projects (new solutions and components: 10 projects; end-user pilots: 10 projects) that will be selected, funded and supported by the XR4ED project, following the Remote evaluation and Awarding Stage. The identified risks encompass various aspects, ranging from potential partner underperformance or withdrawal to challenges in project execution and compliance with quality and ethics standards. The document further delineates the project's scientific, technological, and business objectives, regarding the cascade funding, aimed to catalyze innovation and excellence in XR technologies for education while providing financial and technical support to start-ups, SMEs (Small and Medium-sized Enterprises), and industry players. Specifically, the selected projects funded for the development of innovative XR-based solutions towards the education sector, fall within the two following tracks:

- **Call for Developers'** objective is to enrich the XR4ED platform and targets the development of new solutions and additional components into the XR4ED platform.
- **Call for Pilots'** objective is to run end-user pilots and targets the deployment and customization of the XR4ED solutions and to demonstrate the adoption of XR technologies in an educational environment.

The XR4ED project is structured into several work packages (WPs), each focusing on specific objectives. The risks associated with each WP are meticulously examined, along with their respective likelihood, impact, exposure, triggering factors, and proposed mitigation and contingency actions. Specifically, WP5 is dedicated to the FSTP tendering process and includes all steps from advertising the calls for developers and pilot studies to evaluating the submitted proposals, including their design and implementation, taking as well into consideration the user experience and troubleshooting.

The following sections deal with the specific risks and risk management strategies for **WP5 – Tendering, Mini-Pilots and User Experience**. These include potential data breaches, ethical compliance issues, challenges in XR platform design, software development quality assurance, user experience, and engagement. Each of the risks is evaluated in terms of its likelihood, impact, and exposure, with corresponding actions to mitigate and manage the identified risks effectively.

The document provides a comprehensive overview of the FSTP projects' risk landscape, ensuring that potential challenges are proactively identified and addressed to enhance their chances of success, and as such the success of XR4ED project, the overall objective of which is to design, create and maintain a sustainable on-demand education platform, mobilizing the EdTech and XR community from the EU, providing a central access point to existing solutions and contributing to a leading position for Europe in cutting-edge while ensuring the European values of privacy, ethics, and inclusiveness.

2 Risk Management for the FSTP projects

The report **D1.3 – Quality Plan and Risk Management** is the second part of the two deliverables on the Risk Management of the project, focusing on the management of the Cascade Funding stage. While report number one (D1.2 – Quality Plan & Risk Management – 1) described the XR4ED quality objectives, the tools and methodology used for quality assurance for the XR4ED project product and project management/implementation, this report focuses on the Quality plan and Risk Management actions of the twenty FSTPs, selected through the remote evaluation and awarding stage (D5.1 – Tendering preparation, Evaluation process and selection of appropriate FSTP projects).

2.1 Identified Risks

- Partner under performs or quits the Consortium of the FSTP project.
- Delay in meeting key milestones or deliverables deadlines.
- Any of the XR digital learning solutions/applications or the pilots do not comply with ethics standards.
- Partners not associated.
- Data breach.
- The XR digital learning solutions/applications or the end-user pilots do not meet the inclusiveness and accessibility criteria.
- The integration of the XR third-party solutions/applications into the marketplace is unsuccessful due to lack of interoperability, technical challenges, legislation, etc.
- The quality and performance of the end-user pilots do not comply with current training/learning standards.
- Lack of content (images, video, information) for the end-user pilots.
- Mismatched user needs and design outputs regarding the end-user pilots and despite the good tech performance.
- The quality and believability of the animated avatars for collaborative VR of the end-user pilots do not comply with current standards.
- Limited visibility of the XR digital learning solutions/applications or the end-user pilots to the community.
- Insufficient engagement and participation, potentially jeopardizing the outcomes and the intended impact of third-party solutions, applications, and end-user pilots.
- Deficient innovations impact.

2.2 WP5 – Tendering, Mini-Pilots and User Experience Objectives

WP5 is the core of FSTP tendering process and includes all steps from advertising the calls for developers and pilot studies to evaluating the submitted proposals, including their design and implementation, taking into consideration the user experience and troubleshooting. The final objective will be robust XR applications for education purposes and their evaluation in real environments.

2.2.1 Business Objective 1: Boost the use of the platform by reaching out to potential user groups

XR4ED is intended to be used by stakeholders in education, training, and learning (teachers, students, parents and school administration, members of the EU EdTech and XR community). Dissemination tasks will be planned for raising awareness, promote the services provided by the XR4ED platform. Updates about the latest technologies and project activities will be posted on blogs and newsletters.

2.2.2 Business Objective 2: Deliver a pan-European multi-sided platform for education, training, and learning, validated through tendering and a set of representative long-lasting demonstrations

XR4ED aspires to become one of the leading platforms for XR systems for education, learning and training in EU. Cascade funding will be employed and through a tending process to create user-friendly systems related to:

1. virtual field trips;
2. content creation and exploration;
3. awareness of climate changes and biodiversity challenges;
4. training of young professionals and upskilling;
5. distance and blended learning;
6. accessibility and inclusion.

2.2.3 Business Objective 3: Delivering a sustainable ever-growing ecosystem of collaborating organizations in diverse domains fully utilizing the XR4ED platform and renovating XR in education-related sectors

“XR4ED’s success will be tightly connected to various user groups through an intensive incubation program, which is essential for the expansion of multiplication of the platform value, to guarantee new products and learning services. Dissemination and marketing activities will showcase and demonstrate

the business impact and maximize ROI targeting an open innovation ecosystem. Open-source software and open APIs will be generated, while community engagement of data scientists, developers, entrepreneurs, and other stakeholders will be also pursued through:

1. long-lasting hackathon competitions, webinars, and hands-on training workshops;
2. online and offline channels;
3. attending relevant industrial (and academic events) to generate market demand;
4. articles in the education community and scientific papers.

To further enhance the visibility of the research results, the collected and existing research data will be subject to the H2020 Open Research Data Pilot, where applicable. To ensure the applicability of the FAIR principles, a Data management plan will be prepared detailing data collection, handling, processing, sharing, curation, security, and used methodologies."

2.3 Specific Objectives of the FSTP

As foreseen by the CL4-2022-HUMAN-01-19 call considerations, financial support to third parties is used for the incorporation of third parties (notably SMEs) that will take advantage of the XR4ED solutions by validating and enriching its platform. XR4ED will exploit this opportunity as a means of attracting additional SMEs in the project, as technological contributors to the offer of services to be integrated into the platform and as users and validators of the project's service offer to uptake XR solutions. XR4ED will provide financial support to SMEs that will engage in the following type of activities:

- **Enrichment of the XR4ED platform**: expand the scope of the XR4ED platform with new functionalities and features, the first round addressed external technological providers. Goal of these experiments is to extend the availability of advanced interfaces and modules for the exploitation of XR technologies by integrating additional modules compliant with the infrastructure tackling challenges related to the use of XR technologies in education. Validation of the proposed solutions in real environment is mandatory. technology providers providing new solutions and additional components for the XR4ED platform.
- **New pilots demonstrating the platform's impact**: small consortia including solution providers and users will propose novel pilots that adopt the components of the XR4ED platform, including those developed in the Type A projects. This will make possible to enlarge XR4ED platform portfolio of success stories, and, in the meantime, validate the modules features and effectiveness.

SMEs participating in both above types of activities will also contribute to create awareness around the project results and the project will take advantage of the open calls to build its community and to establish a critical mass of participants in the project ecosystem.

These results contribute to strengthen the uptake of the platform by expanding the XR4ED pool of players with SMEs providing digital learning solutions, including: (i) technological providers that will contribute to enhance the XR4ED offer and (ii) digital learning SMEs that will use the services and solutions of the project. In this way, the open calls will provide the means for enhancing the capabilities of the XR4ED offer, while at the same time serving as a tangible opportunity for validating the offered solutions. These targets define in turn the type of calls that will finance third parties through XR4ED project.

Two rounds of open calls were organized, one per each type of activity introduced above. The objectives per call are summarized in Tables 1 and 2 below, as well as the allocated budget and the expected number of experiments selected per type.

Call type	Objectives	Target participants	Allocated budget	# of experiments
OC1	Validate the expandability of the XR4ED platform. Complement existing modules with added-value features and functionalities. Expanding the XR4ED modules and solutions in the XR4ED portfolio. Attract solution providers to the project ecosystem.	Companies providing XR technologies for education (SMEs or start-ups)	2,4M € (target funding 230k€ per experiment)	10

Table 1 – Objectives of the First Round of the Open Calls

OC2	Further validate the XR4ED concept and platform beyond the pilots of the consortium partners. Demonstrate XR4ED human-centered solutions effectiveness in solving digital learning with XR issues and challenges. Expanding the XR4ED modules and solutions in the XR4ED portfolio. Attract providers of education material to the project ecosystem.	Companies providing digital learning solutions and material for education, universities, vocational training centers	2,4M € (target funding 230k€ per experiment)	10

Table 2 – Objectives of the Second Round of the Open Calls

3 Third-Party Projects Risk Management

3.1 Identified Risks

R1. An XR digital learning solutions/applications or a pilot partner under performs or quits the Consortium of the FSTP project.

R2. Delay in meeting key milestones or deliverables deadlines.

R3. Any of the XR digital learning solutions/applications or the pilots do not comply with ethics standards.

R4. Data breach.

R5. The XR digital learning solutions/applications or the end-user pilots do not meet the inclusiveness and accessibility criteria.

R6. The integration of the XR third-party solutions/applications into the marketplace is unsuccessful due to lack of interoperability, technical challenges, legislation, etc.

R7. The quality and performance of the end-user pilots do not comply with current training/learning standards.

R8. Lack of data and content (images, video, information) for the end-user pilots.

R9. Mismatched user needs and design outputs regarding the end-user pilots and despite the good tech performance.

R10. The quality and believability of the animated avatars for collaborative VR of the end-user pilots do not comply with current standards.

R11. Limited visibility of the XR digital learning solutions/applications or the end-user pilots to the community.

R12. Insufficient engagement and participation, potentially jeopardizing the outcomes and the intended impact of third-party solutions, applications, and end-user pilots.

3.2 Third-Party Projects Risk Mitigation Measures

Table 3: Third-Party Projects Risk Mitigation Measures

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
R1	An XR digital learning solutions/applications or a pilot partner under performs or quits the Consortium of the FSTP project	{L}	{H}	{L}	a) The third-party project coordinator does not communicate with the rest of the partners. b) Inadequate quality control. c) Risk assessment is not properly addressed by the third-party project coordinator. d) Small number of regular checkups.	a) Monthly Steering Committee meetings have been agreed upon from the beginning of the project. b) Partners early scheduling of *ad hoc* meetings as soon as a partner identifies an issue regarding any aspect of the third-party project. c) Project Coordinator communicates with partners often to check up on the tatus of actions that are pending.	a) The Consortium Agreement will foresee such situations and will describe measures to prevent non-compliance to project activities. b) The third-party project coordinator will promptly communicate with the rest of the partners and tasks/activities will be carried out by the consortium.

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#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
						d) The third-party project coordinator and the technical coordinator have a continuous line of communication so that they are both on the same page at any given time.	
R2	Delay in meeting key milestones or deliverables deadlines	{L}	{H}	{H}	a) The project coordinator does not communicate with partners. b) Inadequate quality control. c) Risk assessment is not properly addressed by the project coordinator. d) Small number of checkups.	a) Monthly steering committee meetings have been agreed upon from the beginning of the project. b) Partners early scheduling of *ad hoc* meetings as soon as a partner identifies an issue regarding any aspect of the project. c) Third-party project coordinator communicates with	a) The project coordinator will promptly communicate with the Project Officer to discuss the possibility of extending the deadline for delivery of deliverables.

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
						partners often to check up on the tatus of actions that are pending. d) The project coordinator and the technical coordinator have a continuous line of communication so that they are both on the same page at any given time. e) The Steering Committee will be aware in advance about delays or issues due to project monitoring, implemented tight working relationships and quality control. Milestones and deliverables will have special attention.	

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
R3	Any of the XR digital learning solutions/applications or the pilots do not comply with ethics standards	{L}	{H}	{H}	a) Use of non-validated questionnaires for surveys. b) The consortium does not take advice from external experts. c) Partners do not go through the necessary internal/national ethics steps to approve their experiments.	a) Partners conduct surveys/experiments without going through the proper ethics clearance. b) The consortium will generate a list with externa ethics experts to consult the consortium whenever necessary.	a) The consortium will contact external advice from its experts to Recover from any damage that may occur from an ethics related issue.
R4	Data breach	{L}	{H}	{H}	a) The technical partners of XR4ED Consortium do not properly set up the security measures of the XR4ED Platform and Marketplace, including the security of their modules. b) The technical coordinating partners do not setup adequate and regular data breach security testing periods.	a) Before the Pilot's development phase, the third-party projects' developers will sign an agreement that prevents them from using or sharing any data that were acquired from potential data breach.	a) The technical team will promptly act by isolating affected systems and activating an "Incident Response Team" comprising members of the technical partners and the external ethics advisors, if necessary. Subsequent steps include a thorough assessment, forensic

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
							analysis to understand the breach's origin, transparent communication with internal and external stakeholders, legal compliance, remediation through system patching and security enhancement, and ongoing monitoring and improvement for heightened cybersecurity resilience.
R5	The XR digital learning solutions/applications or the end-user pilots do not meet the inclusiveness and accessibility criteria	{L}	{M}	{H}	a) The user requirements questionnaires did not take inclusivity and diversity issues into consideration.	a) The Scientific Partners of the XR4ED Consortium will collaborate closely with the partner(s) responsible for designing and implementing the surveys. The team	a) Since the Technical team of the project will be using an agile methodology to develop and implement XR4ED products, if at any point an issue regarding the lack of inclusivity and/or

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
						responsible for any surveys will locate relevant validated questionnaires that can be used within the context of XR4ED.	diversity regarding any aspect of the platform/marketplace/ modules the technical team will address them.
R6	The integration of the XR third-party solutions/applications into the marketplace is unsuccessful due to lack of interoperability, technical challenges, legislation, etc.	{L}	{H}	{M}	a) Lack of coordination between technical partners. b) Inadequate analysis of pre-existing products and solutions.	a) Careful analysis of use and technical requirements and third-party solution analysis, secure data management protocols will be conducted in WP4 and WP5. b) In the context of the FSTP calls, third party developers will be coached by appointed internal members of the XR4ED project that will guide the third-party developers to tailor their solutions for the XR4ED platform.	a) The technical team will work closely with the third-party solution providers to fix issues as soon as they arise.

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
R7	The quality and performance of the end-user pilots do not comply with current training/learning standards	{L}	{H}	{M}	a) The third-party project consortium does not take advice from experts. b) Partners do not go through the necessary research prior to the development of the pilots.	a) The third-party project consortium will generate a list with education/training experts to be consulted whenever necessary.	a) The third-party project consortium will contact external advice from experts to recover from any damage that may occur from a training/learning-related issue.
R8	Lack of data and content (images, video, information) for the end-user pilots	{L}	{H}	{M}	a) The content of the third-party project is poor or of poor quality. b) Partners bypass the research phase, proceeding to pilot development without adequate data collection and preparation.	a) The third-party project consortium will generate a list of experts and/or stakeholders to be consulted whenever necessary.	a) The third-party project consortium will seek external expertise to address and recover from any deficiencies in data or content that may arise.
R9	Mismatched user needs and design outputs regarding the end-user pilots and despite the good tech performance	{M}	{H}	{H}	a) The third-party project consortium does not take advice from experts, stakeholders and end-users. b) Partners do not go through the necessary	a) The third-party project consortium will compile a list of experts to consult as needed.	a) The third-party project consortium will consult external experts to implement the necessary measures for module redesign.

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
					research regarding user needs, prior to the development of the pilots.		
R10	The quality and believability of the animated avatars for collaborative VR of the end-user pilots do not comply with current standards	{L}	{H}	{M}	a) The third-party project consortium does not take advice from VR experts. b) Low quality despite	a) Measures will be taken by the technical partners of the consortium to reengineer modules that affect social performance such as XAI, Generative AI interfaces and Operator 4.0 training platform modules.	a) The third-party project consortium will contact external advice from experts from the consortium, as well as from external experts to recover from the technical issues that may arise.
R11	Limited visibility of the XR digital learning solutions/applications or the end-user pilots to the community	{M}	{H}	{H}	a) The project fails to attract visibility and thus fails to achieve its dissemination KPIs. b) Partners do not actively participate in dissemination efforts.	a) The Dissemination and Communication activities from WP6 will ensure the full visibility of the XR digital learning solutions/applications or the end-user pilots. When appropriate, all	a) By evaluating current engagement trends and gathering stakeholder feedback, targeted refinements to platform's features will be targeted. The actions for augmenting the visibility will focus

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
						consortium members will disseminate information about the developed products through their own networks.	on stimulating user involvement through strategic communication, offering participation incentives, fostering collaboration, and maintaining ongoing performance monitoring. These efforts will promote community building and ensure a dynamic, responsive platform that adapts to the evolving needs of educators, students, and the XR community, ultimately enhancing the platform's visibility and impact.
R12	Insufficient engagement and participation, potentially jeopardizing the	{M}	{H}	{H}	a) The Projects' dissemination KPIs are not met.	a) The Dissemination and Communication activities from WP6 will	a) Through analysis of current engagement levels, soliciting

#	Risk Description	Likelihood	Impact	Exposure	Risk Symptoms - Triggering Factors for Action	Risk Control & Mitigation Actions	Risk Contingency - Recovery Actions
	outcomes and the intended impact of third-party solutions, applications, and end-user pilots				b) Not all partners engage in dissemination activities.	ensure the full visibility of the platform, including the XR digital learning solutions/applications and the end-user pilots. When appropriate, all consortium members will disseminate information about the marketplace through their own networks.	valuable feedback from stakeholders to inform targeted refinements of platform features. Through strategic communication, incentives for participation, user training, collaborative partnerships, and continuous monitoring, the recovery actions will aim to invigorate user involvement, foster community building, and ensure a dynamic, responsive platform that meets the evolving needs of educators, students, and the XR community.

4 Conclusion

The XR4ED project's Cascade Funding risk management plan reflects a proactive and structured approach aiming to address potential challenges in developing an innovative XR education platform. By thoroughly identifying, evaluating, and mitigating risks that could arise during the development and execution phases of the FSTPs, the project's Consortium ensures a solid foundation for their successful implementation. Taking into account ethical and technical standards, data security, and active stakeholder engagement, the Cascade Funding risk management plan reflects XR4ED's commitment to build one of the leading platforms for XR systems for education, learning and training in the EU, as well as user-friendly systems related to virtual field trips, content creation and exploration, awareness of climate changes and biodiversity challenges.

As the project progresses, it will be crucial to maintain continuous risk assessment, respond flexibly to emerging challenges and foster open communication between XR4ED's Consortium partners, as well as between the members of the Consortiums of the third-party projects. These risk management strategies will support the project's ambitious goals and promote a thriving, sustainable ecosystem for XR technologies in education and training. With this proactive framework, XR4ED is well-equipped to navigate complexities and deliver meaningful outcomes for educators, learners, and other stakeholders in the rapidly evolving field of Extended Realities technologies.

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