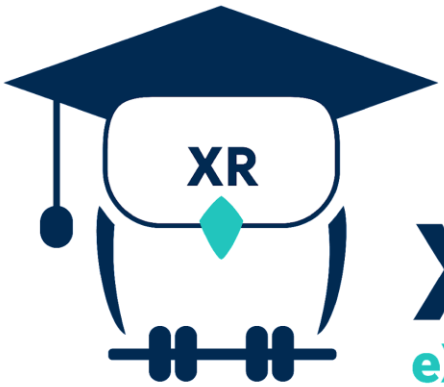
Ref. Ares(2023)8888915 - 28/12/2023

Horizon Innovation Action
HORIZON-CL4-2022-HUMAN-01-19



XR4ED
eXtended Reality for EDucation

D1.2
Quality Plan & Risk Management – 1

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XR4ED Project Profile

Project title	eXtended Reality for EDucation
Project acronym	XR4ED
Grant agreement No.	101093159
Start date of project	1 January 2023
Duration of project	36 months
Project website	http://www.XR4ED-h2020.eu

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
VASS	Vass Group (ex. CRI)	INDUSTRY	Luxemburg
SIMAVI	Software Imagination & Vision SRL	SME	ROMANIA
UPC	Universitat Politecnica de Catalunya	RESEARCH	SPAIN
CELLOCK	CELLOCK	SME	CYPRUS

Document information

Related work package	WP1	
Document reference	D1.2	
Related deliverables	D1.1, DX.X	
Type		DEM - Demonstrator, Pilot, Prototype
		DMP - Data Management Plan
	✓	R - Document, Report
Status	final	
Version	2	
Due date	31/12/2023	
Submission date	28/12/2023	
Lead partner	(CYENS)	
Contributing partners	(CELLOCK)	
Reviewers	Dr. Fotis Liarokapis, Dr. Charis Zacharatos	
Keywords	Risk Assessment, Mitigation measures	

Dissemination level	
✓	PU: Public
	SEN: Sensitive

List of contributors	
Name	Partner (short name)
Dr. Alkis Nicolaides	CYENS
Dr. Fotis Liarokapis	CYENS

Revision History

Document History			
Version	Date	Change editors	Changes
1	18/12/2023	CYENS	Initial version of the document
2	28/12/2023	CYENS	Final version

Quality control		
Role	Partner (short name)	Approval date
Deliverable leader	CYENS	28/12/2023
Quality manager	CYENS	28/12/2023
Project coordinator	CYENS	28/12/2023

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List of acronyms

Acronym	Description
XR4ED	Extended Reality for Education

Executive summary

The Quality Plan & Risk Management - 1 Deliverable (D1.2) is a live document that outlines the quality objectives, the tools and methodology used for quality assurance for the XR4ED project product—the XR4ED Platform—and project management/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— that could jeopardize the project's results, accompanied with their corresponding mitigation measures is included within the quality plan.

Quality objectives, tools, and methodology used for quality assurance within the context of the XR4ED project—both project management/implementation and the XR4ED project product (XR4ED Platform, Marketplace)—have already been covered in the Project Handbook (Deliverable 1.1) therefore, to avoid unnecessary repetition that information will be included as annex material within this deliverable.

The information already included in the Project Handbook includes:

A.) The implementation aspects regarding co-creation and consultation mechanisms, official and internal reporting procedures, decision-making and conflict resolution processes to be applied during the XR4ED implementation.
B.) Document control aspects regarding the documentation requirements, templates and naming conventions and versioning.
C.) Internal audit control mechanisms for the deliverables and appropriate corrective actions to be taken.

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 specialised 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 personalised, 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.

Introduction of Risks and Quality Plan

All the actions of XR4ED are implemented towards the successful development, launch, and maintenance of the XR4ED platform. The high level of quality of the actions (Reports, Surveys, Dissemination activities, as described in the proposal, the consortium developed and continuously maintains a risk assessment and contingency plan describing the potential risks

and the respective mitigation actions. 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. and is still frequently updated, throughout the project's duration, to accommodate all emerging issues.

The document outlines the risk management plan for the XR4ED project, which aims to enhance Extended Reality (XR) technologies for education in the European Union. The identified risks encompass various aspects, ranging from potential partner underperformance or withdrawal to challenges in project execution and compliance with ethics standards. The document further delineates the project's scientific, technological, and business objectives, emphasizing the importance of privacy, ethics, and inclusiveness in the development of an innovative, sustainable XR education platform.

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. For instance, in WP1, dedicated to project management, risks related to partner performance and project execution delays are addressed through regular communication, quality control measures, and contingency planning.

The subsequent sections delve into the specific risks and risk management strategies for WPs 2 through 6. These include potential data breaches, ethical compliance issues, challenges in XR platform design, software development quality assurance, user experience, and engagement. Each risk 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 XR4ED project's risk landscape, ensuring that potential challenges are proactively identified and addressed to enhance the project's chances of success.

2 Risk Management

2.1 Identified Risks

- Partner under performs or leaves the Consortium.
- Project execution failure (key milestones or deliverables delayed).
- Any of the XR4ED actions (Surveys, Tests, Platform, Modules) do not comply with ethics standards.
- Project delays due to a Covid-19-like pandemic limits travelling.
- Data Breach.
- Early prototypes don't meet the inclusiveness criteria.
- Integration of third-party solutions into the marketplace is not so successful due to lack of interoperability, technical challenges, legislation, etc.
- Lack of focus on the platform and marketplace during the Development phase leading to more developed modules rather than a robust platform.
- Engagement and participation to the marketplace is not adequate to ensure the outcomes and the required impact.
- Some technological solutions offered by XR4ED are being presented by the industry during this project.
- Additional low-cost position trackers being introduced by the industry Those solutions could mitigate any positional, tracking issue, within XR context, but they are likely to still suffer from the lack of time consistency that can be observed in IK solutions.

2.2 XR4ED Objectives – Scientific| Technological | Business

Scientific Objective 1: Enhancing XR technologies for education:
"This objective focuses on enhancing existing XR technologies (TRL4-5) and taking them to a TRL7 to enable developers to create innovative XR applications for teaching, learning, and training purposes through a cloud-based open-access DevOps environment. Interoperable XR components will be developed to expand stakeholders' capabilities to discover, mix and re-use different components and create new learning solutions with XR."

Technological Objective 1: To implement an innovative sustainable on-demand education platform, mobilising the EdTech and XR EU community:
"Design, create and maintain the XR4ED platform as a central access point to existing XR solutions and contributing to a leading position for Europe in cutting-edge while ensuring the European value of privacy, ethics, and inclusiveness. XR4ED platform aims to:
Facilitate the cooperation and sharing of XR knowledge between members of EU with the use of a marketspace: Offer and demand space allowing offers/requests for XR4ED-related services.
Promote European digital educational XR solutions by sharing them to existing catalogues and repositories. XR solutions catalogue will be open to European players to submit and promote their ready-to-market XR."

TO2: Formulating privacy and ethics standards for the XR EU community:
"A Working Group will be formed to respect ethics on privacy, ethics, and inclusiveness of XR EdTech, to create guidelines and submit them to an Ethics Observatory common space. XR4ED social partners will design a human-centred approach and create an ecosystem of trust which be compliant with EU rules to protect users' fundamental rights."

Business Objective 1: To 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."

BO2: To 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 virtual field trips, content creation and exploration, awareness of climate changes and biodiversity challenges, 4. training of young professionals and upskilling, 5. distance and blended learning, 6. accessibility and inclusion."

BO3: Delivering a sustainable ever-growing ecosystem of collaborating organisations in diverse domains fully utilising 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 maximise 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."

3 RISK Management per WP

3.1 WP<1> "Project Management" – {Management} Risks

Objectives Linked to WP1:

- The success of WP1 affects all objectives as poor project management can impact all aspects of the project.

Risks Validity: M<*1*>-M<*36*>
Risks Owner: WP<*1*> CYENS

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Risk***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Partner under performs or leaves the Consortium	{L}	{H}	{L}	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) Project Coordinator communicates with 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.	a) The Consortium Agreement will foresee such situations and will describe measures to prevent non-compliance to project activities. b) The Project Coordinator will promptly communicate with the rest of the partners and tasks/activities will be carried out by the consortium.
2	Project execution failure (key milestones or	{L}	{H}	{H}	a) The project coordinator does not communicate with partners.	a) Monthly Steering Committee meetings have	a) The project coordinator will promptly communicate with the Project Officer to

	deliverables delayed)				b) Inadequate quality control c) Risk assessment is not properly addressed by the project coordinator. d) Small number of checkups	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) Project Coordinator communicates with 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	discuss the possibility of extending the deadline for delivery of deliverables.

Table 1 WP1 Risk Management Rubric

3.2 WP<2> "Ethics Requirements – Human-Centred Design" – {Technical/Management} Risks

Objectives Linked to the WP2:

- **TO2: Formulating privacy and ethics standards for the XR EU community:**
  "A Working Group will be formed to respect ethics on privacy, ethics, and inclusiveness of XR EdTech, to create guidelines and submit them to an Ethics Observatory common space. XR4ED social partners will design a human-centred approach and create an ecosystem of trust which be compliant with EU rules to protect users' fundamental rights."

Risks Validity: M<*2*>-M<*36+*>
Risks Owner: WP<*KT, CELLOCK, CYENS*>

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Action***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Data Breach	{L}	{H}	{H}	a.) The technical partners (CELLOCK, NUROGAMES, SIMAVI, CYENS, UPC) do not properly set up the security measures of the XR4ED platform and marketplace as well as the security of their modules. b.) If the Technical coordinating partners does not setup adequate and regular data breach security testing periods	a) Before the piloting the third-party 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 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.
2	Any of the XR4ED actions (Surveys, Tests, Platform, Modules) 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.

Table 2 WP2 Risk Management Rubric

3.3 WP<3> "XR4ED platform design" – {Technical/Impact} Risks

Objectives linked with WP3:

- **Technological Objective 1: To implement an innovative sustainable on-demand education platform, mobilising the EdTech and XR EU community:**
  "Design, create and maintain the XR4ED platform as a central access point to existing XR solutions and contributing to a leading position for Europe in cutting-edge while ensuring the European value of privacy, ethics, and inclusiveness. XR4ED platform aims to:
  Facilitate the cooperation and sharing of XR knowledge between members of EU with the use of a marketspace: Offer and demand space allowing offers/requests for XR4ED-related services.
  Promote European digital educational XR solutions by sharing them to existing catalogues and repositories. XR solutions catalogue will be open to European players to submit and promote their ready-to-market XR."

- **TO2: Formulating privacy and ethics standards for the XR EU community:**
  "A Working Group will be formed to respect ethics on privacy, ethics, and inclusiveness of XR EdTech, to create guidelines and submit them to an Ethics Observatory common space. XR4ED social partners will design a human-centred approach and create an ecosystem of trust which be compliant with EU rules to protect users' fundamental rights."

Risks Validity: M<*1*>-M<*12*>
Risks Owner: CELLOCK, CYENS

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Action***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Early prototypes don't meet the inclusiveness criteria	{L}	{M}	{H}	a.) The User Requirements questionnaires did not take inclusivity and diversity issues into consideration.	a) The Scientific Partners will collaborate closely with the partner(s) responsible for designing and implementing the surveys. The team responsible for any surveys will locate relevant validated questionnaires that can be used within the context of XR4ED	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/diversity in regard to any aspect of the platform/marketplace/modules the technical team will address them.

2	Some technological solutions offered by XR4ED are being presented by the industry during this project	{H}	{M}	{L}	N/A	a)The Consortium will keep track of news surrounding the XR technological advancements.	a) The Technical team will follow agile methodology while maintaining the XR4ED platform to, if necessary, match and align itself with new industry solutions/trends.
3	Additional low-cost position trackers being introduced by the industry Those solutions could mitigate any positional, tracking issue, within XR context, but they are likely to still suffer from the lack of time consistency that can be observed in IK solutions.	{M}	{L}	{L}	N/A	a) The technical team will incorporate such trackers into the project's pipeline to further strengthen the quality of our machine learning solutions.	a) The consortium's leading principle is to first and foremost focus on designing the platform in a way that users will be able to mostly use it with low-cost devices i.e. mobile phones rather than relying on expensive equipment such as VR Sets (Headset and limb trackers) b) The Technical team will follow agile methodology while maintaining the XR4ED platform to, if necessary, match and align itself with new industry solutions/trends.

Table 3 WP3 Risk Management Rubric

3.4 WP<4> "Platform Agile Development and Deployment" – {Technical/Impact} Risks

Objectives Linked with WP4:

- **Technological Objective 1: To implement an innovative sustainable on-demand education platform, mobilising the EdTech and XR EU community**:
  "Design, create and maintain the XR4ED platform as a central access point to existing XR solutions and contributing to a leading position for Europe in cutting-edge while ensuring the European value of privacy, ethics, and inclusiveness. XR4ED platform aims to:
  Facilitate the cooperation and sharing of XR knowledge between members of EU with the use of a marketspace: Offer and demand space allowing offers/requests for XR4ED-related services. Promote European digital educational XR solutions by sharing them to existing catalogues and repositories. XR solutions catalogue will be open to European players to submit and promote their ready-to-market XR."
- **BO2: To 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 virtual field trips, content creation and exploration, awareness of climate changes and biodiversity challenges, 4. training of young professionals and upskilling, 5. distance and blended learning, 6. accessibility and inclusion."

Risks Validity: M<*13*>-M<*36*>
Risks Owner: CELLOCK

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Action***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Early prototypes don't meet the inclusiveness criteria.	{L}	{M}	{H}	a.) The User Requirements questionnaires did not take inclusivity and diversity issues into consideration.	a) The Scientific Partners will collaborate closely with the partner(s) responsible for designing and implementing the surveys. The team responsible for any surveys will locate relevant validated questionnaires that can be used within the context of XR4ED.	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/diversity in regard to any aspect of the platform/marketplace/modules the technical team will address them.
2	Integration of third-party solutions into the marketplace is not so successful due to lack of interoperability,	{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 3rd party solution analysis, secure data management protocols will be conducted in WP4 and WP5.	a) The Technical team will work closely with the third-party solution providers to fix issues.

	technical challenges, legislation, etc.						
3	Some technological solutions offered by XR4ED are being presented by the industry during this project	{H}	{M}	{L}	N/A	a) The Consortium will keep track of news surrounding the XR technological advancements. b) Even though some improvements to current self avatar movement could be expected, there will still be challenges to face. Vision-based techniques depend on the camera capturing the full body and thus are limited by occlusion problems.	a) The Technical team will follow agile methodology while maintaining the XR4ED platform to, if necessary, match and align itself with new industry solutions/trends. b) The technical Team will use machine learning methods can help to fill the gap for lost data.
4	Additional low-cost position trackers being introduced by the industry Those solutions could mitigate any positional, tracking issue, within XR context, but they are likely to still suffer from the lack of time consistency that can be observed in IK solutions.	{M}	{L}	{L}	N/A	a) The technical team will incorporate such trackers into the project's pipeline to further strengthen the quality of our machine learning solutions.	a) The consortium's leading principle is to first and foremost focus on designing the platform in a way that users will be able to mostly use it with low-cost devices i.e. mobile phones rather than relying on expensive equipment such as VR Sets (Headset and limb trackers)
5	Lack of focus on the platform and marketplace during the Development phase leading to more developed modules rather than a robust platform.	{L}	{H}	{M}	a) The technical partners develop a large number of modules that are not connected with the main functionality of	a) The Consortium will plan to create a series of videos that demonstrate the usability of the platform and how the various users can take advantage of it for both	a) The technical team will shift its direction on developing the platform to the point that its usability is at a high level.

					the platform, prior to the completion of the Platform/Marketplace b) Lackluster demos of the platform	dissemination purposes but to also use it as a method to focus on the platform and its users.	

Table 4 WP4 Risk Management Rubric

3.4.1 WP4 | Software Development Quality Assurance Information

Quality Assurance Test Phase:

• Create and carry out an internal test plan. The purpose of the QA Test activity plan is done to verify that the application meets the System Requirements Specification (SRS).

• The Application will be tested by the QA Team in its target environment, which includes hardware, software, communications, network, and interface. This does not test functionality on any third party products but will provide guidance and support in setting up.

Quality Assurance (QA) Team

- **Primary role is to ensure that proper testing occurs for all changes released into the production environments. The following are the responsibilities of this team:**
    - Review and understand the functional test plan.
    - Assist in preparing and modifying project specific test data.
    - Conduct test execution (both manual and automated).
    - Validation and reporting of test results.
    - Defect and issue identification, logging, tracking, resolution, and reporting.

- Ensure testing commitments are met and communicate potential impacts to target dates.
- Help identify and implement new process improvements. Assist in existing process improvements.

- **The Quality Assurance Team Personnel shall have the following skills and knowledge:**
  - Knowledge of change management principles, methodologies and tools.
  - Knowledge of Information Security methodology, principles and practices.
  - Excellent verbal and written communication skills.
  - Excellent analytical skills.
  - An understanding of business.
  - Familiarity with relevant technical information and equipment.
- **The Quality Assurance Team of will include one Quality Assurance Manager (CELLOCK) and one or more Quality Assurance Engineers (CELLOCK), depending on the size and complexity of the sub-system that the specific partner is responsible for.**

3.5 WP<5> "Tendering, Mini-Pilots and User Experience" – {Management/Impact} Risks

Objectives Linked with WP5:

- **Business Objective 1: To 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."

- ***BO2: To 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 virtual field trips, content creation and exploration, awareness of climate changes and biodiversity challenges, 4. training of young professionals and upskilling, 5. distance and blended learning, 6. accessibility and inclusion."

- ***BO3: Delivering a sustainable ever-growing ecosystem of collaborating organisations in diverse domains fully utilising 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 maximise 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."

Risks Validity: M<*6*>-M<*36*>
Risks Owner: UPC, F6S, CELLOCK

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Action***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Data Breach	{L}	{H}	{H}	a.) The technical partners (CELLOCK, NUROGAMES, SIMAVI, CYENS, UPC) do not properly set up the security measures of the XR4ED platform and	a) Before the piloting the third-party 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,

					marketplace as well as the security of their modules. b.) If the Technical coordinating partners does not setup adequate and regular data breach security testing periods		forensic 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.
2	Integration of third-party solutions into the marketplace is not so successful 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 3rd 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 they arise.

Table 5 WP5 Risk Management Rubric

3.6 WP<6> "Exploitation, Dissemination & Communication" – {Management/Impact} Risks

Objectives Linked with WP6:

- **Business Objective 1: To 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."

- **Scientific Objective 1: Enhancing XR technologies for education:**
  "This objective focuses on enhancing existing XR technologies (TRL4-5) and taking them to a TRL7 to enable developers to create innovative XR applications for teaching, learning, and training purposes through a cloud-based open-access DevOps environment. Interoperable XR components will be developed to expand stakeholders' capabilities to discover, mix and re-use different components and create new learning solutions with XR."

Risks Validity: M<*1*>-M<*36*>
Risks Owner: SciCo

#	***Risk Description***	***Likelihood***	***Impact***	***Exposure***	***Risk Symptoms / Triggering Factors for Action***	***Risk Control & Mitigation Actions*** *(to reduce probability and/or impact)*	***Risk Contingency / Recovery Actions*** *(if the risk actually occurs)*
1	Engagement and participation to the marketplace is not adequate to ensure the outcomes and the required impact.	{M}	{H}	{H}	a) The Projects Dissemination KPIs are not being met. b) Not all partners engage in dissemination activities	a) The Dissemination & Communication activities from WP6 will ensure the full visibility of the marketplace. When appropriate, all consortium members will disseminate information about the marketplace through their own networks.	a) Through analysis of current engagement levels, soliciting 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.

Table 6 W6 Risk Management Rubric

3.6.1 WP6 | Dissemination/Communication KPIs

Name	KPI	Delivery Month(s)	Status
Project Branding	1	4	Reached/Done
Local and International events attendance	30	36	5
National workshops for local stakeholders (1 event per country/>20 participants per workshop)	5	18	Pending
International roundtable in Athens Greece	1	36	Pending
Targeted meetings with local stakeholders to discuss project outcomes and achievements	5	12/18/36	1 Cyprus, 1 Greece, 1 Spain
XR4ED Banner – one for each partner country	8	6	Reached/Done
XR4ED Flyers/ brochures – two flyers (translated to all partners languages)	16	6/18	English Brochure Designed and Printed by all partners
Infographics	2	18/36	Pending
Scientific Publications	3	12/24/36	2
Mailing list (stakeholder – 800 recipients (national & international)	1500+recipients	36	
Newsletters – six newsletters	6	6/12/18/24/36	2
Social networks (LinkedIN, Facebook, Twitter)	3	4	Reached/Done
Broadcasts in local media – at least 10 broadcasts in local Media	10	36	1
XR4ED Build-up portal articles	3	18/36	

Table 7 Dissemination & Communication KPIs Current Status

4 Conclusion

In conclusion, the detailed risk management plan for the XR4ED project reflects a proactive and systematic approach to navigate potential challenges in the development of an innovative XR education platform. By meticulously identifying, assessing, and addressing risks across various work packages, the project team demonstrates a commitment to ensuring the success of the endeavor. The integration of ethical considerations, data security measures, and strategic engagement practices underscores the project's dedication to creating a robust, inclusive, and impactful platform for European education.

As the XR4ED project progresses, continuous vigilance, effective communication, and *agile* adaptation to emerging challenges will be crucial to realizing its ambitious objectives and fostering a sustainable ecosystem for XR in education. Through these comprehensive risk management strategies, the project is well-positioned to overcome obstacles and deliver tangible benefits to stakeholders in the dynamic landscape of Extended Reality technologies for learning and training.

Annex I: Quality Assurance Items from D1.1 Project Management Handbook

Projects Management Structure and Defined Roles

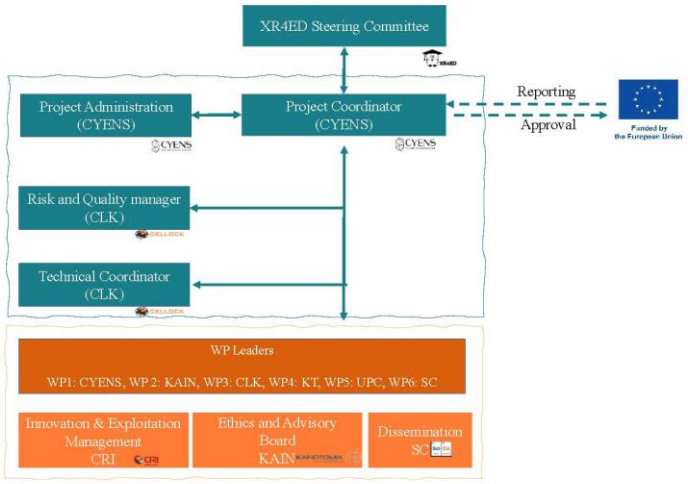

Figure 1: XR4ED Management Structure

2.2.1 Project Bodies and Main Roles

Description and duties of these entities are fully described in the Grant Agreement and are thus only briefly reported here:

Steering Committee: The Steering Committee is the main decision body of the consortium, and is constituted of the Project Manager, Partner Representatives, the Technical Manager, the Project Coordinator and the Risk and Quality Manager. The Steering Committee oversees all formal decisions regarding the technical and business direction of the project; the performance of the partners in relevance

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with the Contract; the Description of Work document or the Consortium Agreement; Specific contractual issues with the EC; Policies for promotion and exploitation of results, administrative arrangements etc.

Project Coordinator: The Project Coordinator plans the overall project execution and administers project resources in accordance with the project Description of Action (DoA) and the Consortium Agreement. He also monitors the project execution and initiates corrective actions where possible. He is the main project representative and the formal communication point with the EC and other bodies. He continuously communicates with all the partner representatives, the Work Package leaders to monitor the proper project execution, informs the Steering Committee on the overall progress and makes suggestions for major changes or actions if necessary. This role will be taken by CYENS.

Partner representative: The partner leader will be the key representative of each partner in the implementation of the activities as specified in the project implementation plan. The representative participates in the Steering Committee meetings, and is responsible for coordinating the internal (partner's) resources according to the GA and the CA.

WP Leader: WP leaders are responsible for the smooth execution of each Work Package. The term refers both to a project partner and its representative. The main responsibilities include coordination of WP partners; review and evaluation of WP results; cooperation with other WP leaders to ensure smooth evolution of the project's various phases; reporting to the Project Manager on the WP progress.

Technical Manager Coordinator: The Technical Manager is responsible for all technical aspects of XR4ED project. Together with the WP Leaders, the Technical Manager defines the specifications and design principles and is responsible for the consistency of all project results through the implementation phases. CELLOCK will take this role.

Risk and Quality Manager: The Risk and Quality Manager is responsible for the implementation of the quality procedures determined in the Quality Plan and the verification of the project results. His main responsibilities include monitoring and implementation of the quality procedures described in the quality plan. CELLOCK will undertake the specific role.

Innovation Manager: This person's role will be to define the innovation process to be followed in the project and ensure that it is being duly followed. The Innovation Manager will oversee aligning the technical development of tools and services with the business exploitation, to ensure a proper uptake of project results by the market. This person is the one that will coordinate the exploitation tasks and will work in close collaboration with the Technical Manager.

With emphasis on the activities of WP6 (Exploitation, Dissemination and Communication), the project has anticipated the following roles (also Task leaders):

- The **Project Exploitation and Innovation Manager** is **CRI**. ENG will guide the definition and execution of market activities, as well as bring the research and innovation results into a concrete business proposition.
- The **Dissemination Manager** is **SC**. The Dissemination Manager has strong dissemination competences in both industrial companies and the academic world, as it is very active in events related to the aviation industry, as well as the ICT domain.

Also, the consortium decided to establish the following supported roles:

Data Protection Officer: The Data Protection Officer will be responsible for monitoring ethics with regards to the data to be used and processed on the platform. This role is undertaken by CYENS' DPO.

The following tables illustrated the names for each role or body presented above:

#	Partner	Representative
1	CYENS	Dr. Fotis Liarokapis
2	KONNEKTABLE	Dr. Angelos Liapis
3	SciCo	Dr. Theodore Anagnostopoulos
4	F6S	Nuno Varandas
5	InfinityDesingLabs	Dr. Georgios Kalmpourtzis
6	KAINOTOMIA	Mike Triantafillou
7	NUROGAMES	Mr. Jens Piesk
8	CRI	Mr Leonidas Somakos
9	Software Imagination & Vision SRL	Monica Florea
10	Universitat Politecnica de Catalunya	Dr. Nuria Pelechano
11	CELLOCK	Dr. Haris Zacharatos

Table 1: Project Main Roles

Role	Partner	Representative
Project Coordinator	CYENS	Dr. Fotis Liarokapis
Risk and Quality Manager	CELLOCK	Dr. Haris Zacharatos
Technical Manager	CELLOCK	Dr. Haris Zacharatos
Exploitation and Innovation Manager	CRI	Mr Leonidas Somakos
Dissemination Manager	SC	Dr. Theodore Anagnostopoulos
DPO	CYENS	Dr Anthoula Fotsiou-Psoma
Ethics and Advisory Board Manager	KAIN	Mike Triantafillou
WP1 Leader	CYENS	Dr. Fotis Liarokapis

Decision Making and Conflict Resolution

3 Implementation Aspects

The implementation aspects of XR4ED consists of two parts which are described below, including: decision making and conflict resolution.

3.1 Decision Making

Decisions regarding the project implementation will normally be taken by the team members upon reaching consensus with the WP leaders. Typically, agreement will be reached first by informal contact, followed by official confirmation via electronic mail, letter or agreed written minutes. In case there is a dispute between two or more team members, a conflict resolution procedure must be followed, as presented in the specific document. For important issues, the agreement may take the form of a short report that needs to be signed by the Steering Committee. Non-technical factors such as resource allocation and contractual terms will also need to be agreed on and documented in writing. The key driver for the decision-making procedures is the description of work to be performed as stated in the Contract, the Consortium Agreement, the DoA and the Quality Plan, and as regularly communicated within the consortium. Transparency of the implementation decisions and actions will be achieved by adequate communication of the emerging issues on project meetings and e-mail communications.

3.2 Conflict Resolution

Generally, technical issues or conflicts within the contractual commitments that do not involve any contract, budget, resource allocation or overall project focus changes will be discussed at work package level first. If the decision reached between team members is unacceptable by other partners, the conflict will be resolved according to a conflict resolution procedure which can be summarized in the next steps:

1. The team members involved in the implementation of the work package will inform the WP leader of the emerging conflict.
2. The WP leader will decide whether the issue needs to be discussed in a teleconference or a dedicated WP Meeting. The WP Leader will inform the PM of the planned actions.
3. The result of the teleconference or the meeting will be communicated to the PM.
4. If no consensus has been reached so far, the PM will contact the responsible persons and will try to resolve the conflict.
5. In case that the disagreement remains, the issue will be escalated in the Steering Committee. The decision that will be taken at this level will be considered as the final resolution of the issue.

Process for Deliverable Submission

5 Deliverable Submission

5.1 Submission Details

The different technical objectives set for the project have their correspondence within the work packages and defined tasks. Compliance with these technical objectives is evident by on-time delivery the corresponding Deliverables. Each deliverable is assigned to Lead Beneficiary partners who will be responsible for its elaboration on the due date. Every Lead Beneficiary is fully responsible for the deliverable's quality and is required to maintain adequate control of the participants' contributions.

The deliverables shall be submitted to the EC in English, by electronic means (in pdf format in the Participants Portal) or in any other format only if required by EC. The appropriate and updated deliverable template can be found in the XR4ED Project Repository.

All the deliverables must be finalized and submitted to the EC within the deadlines defined in Annex I of the Grant Agreement.

The process to be followed for the deliverable preparation and submission is:

- 60 days before the delivery date at latest - The Lead beneficiary must draw a "template" of the official document. The template must include at least the table of contents and an outline of the contents. The template must indicate a) the responsible partner of each Deliverable section (e.g., Task leaders); b) section responsible partners must indicate and assign working items/contents to the other involved partners.
- 20 days before the delivery due date at the latest - Partners must provide their high-quality contributions.
- 15 days before the delivery due date at latest - The Lead beneficiary must deliver the candidate version of the official document to the coordinator. The coordinator appoints two internal reviewers (but external to the proposing team) to assess the quality of the document.
- 10 days before the delivery due date at latest - The reviewers must provide feedback to the Coordinator and the Lead beneficiary. If necessary, the Lead beneficiary along with the involved partners must revise the document.
- 3 days before the delivery due date at latest - The Coordinator must receive the final version of the document: and
- On the delivery due date at latest – The Project Coordinator uploads the final version of the Deliverable to the Participant Portal, the XR4ED Document Management System and, if it is a public document, to the project website.

Table 3 illustrates all the project deliverables in chronological order. During the kick-off meeting, the reviewing partners have been allocated for all deliverables up to M15.

Document Control and Documentation Requirements

D6.9	Dissemination, Awareness raising and Communication Plan - 4	SciCo	36
D6.2	Project Communication and Promotional Activities Report	SciCo	36
D6.3	Exploitation plan	CRI	36
D6.4	Network of Interest Report	SciCo	36
D6.10	XR4ED Business plan - 2	KT	36

Table 3: Project Deliverables – Responsible partners

5.2 Document Control Management

The Document Control Management deals with the preparation of template documents, the identification and the tracking of changes related to draft and final versions of documents circulated among the partners. The Project Coordinator is responsible for the necessary assessment of deliverables, while the Quality Manager will be responsible for the overall monitoring of the entire document control and configuration management activities described in this section.

5.2.1 Documentation Requirements

In the span of the XR4ED project, a set of deliverables and relevant documented results are anticipated as depicted in the following table. Such documents will be sent by e-mail and be uploaded in the restricted XR4ED document repository, if they comply with the following standards:

- Word Processor: Microsoft Word
- Spreadsheet: Microsoft Excel
- Presentations: Microsoft PowerPoint

All files should be scanned for potential viruses before issue and screened on receipt. If an acknowledgement is requested, an explicit request should be included by the sender at the top of the message (e-mail, fax, etc.).

Reports & Deliverables Internal Audit Report Template

Annex V: Internal Audit Report Template

Internal Review Report Template XR4ED_Internal_Review_Report_Template.docx

	Overall peer review result
✓	*(a) acceptable in the current state*
	(b) acceptable with minor revisions
	(c) acceptable with major revisions
	(d) the report is not accepted, should be redrafted, and undergo a 2nd version review

Review axes

Rate from 5-1, 5: when your evaluation on the criterion gets the highest score, and 1 when your evaluation to the criterion gets the lowest score. In case of Not Applicable criterion, state N/A and explain why.

Content				
Criteria and explanation	**Score**	**Explanation of score by reviewer**	**Suggested improvements**	**Response from author/writer**
Main objective of the report - Does it set out to do what it says in DoW? Are objectives clearly and simply stated and in line with the DoW (and description of the Task). Further is it clear how these objectives are relevant to the overall targeted results of the project as a whole?	1-5			

References and building on previous work? Have they overlooked any state of the art, previous work, related projects, regulations, or best practices? Does the report include and make use of relevant and necessary references?	1-5			
Methodology - Was the work, development, trial, experiment, or study conducted in a sensible way? Are the methods / procedures appropriate, and correct?	1-5			
Conformance of results - Did the report do what was promised? Do the findings and results of the work match the objectives as described in the DoW and are these results clearly described in the report?	1-5			
Usefulness of results - Is the report (and associated results) actually useful to downstream tasks or customers? Is it clear that the results are useful and relevant? Is it clear how results can be accessed? Are plans	1-5			

realistic and actionable? Is it clear that they are not committing downstream tasks to something impossible?				
Conclusion - Is there a conclusion chapter and does it make sense?	1-5			
Presentation				
Readability - Can you understand it easily? Is the document easy to read and understandable?	1-5			
Language - Are there any obvious spelling or grammar mistakes? Is the English in the report good? Is the writing style clear, concise and accessible?				
Structure				
Consistency with DoW - Can the reader easily tell (e.g., by looking at the table of contents) where in the document each point in the DoW is addressed? Is it clear that the Report reflects the DoW?				
Structure - Is the structure of the report logical and easy to follow?				

Conformance to template				
Template - Is the document template applied properly?				
Graphics - Are figures and tables legible and referred to in the text?				
Referencing - Are papers and other articles correctly cited and referenced?				
Terms - Are terms defined in the glossary? Unusual technical terms and acronyms should be added to the glossary. Ideally, they should be also defined in text the first time they are used unless this reduces readability or they are well known.				
Nomenclature - Are mathematical symbols defined?				
Overall conclusion				
Quality [Select among the four options: (a) acceptable in the current state. (b) acceptable with minor				

revisions. (c) acceptable with major revisions, (d) the Report is not accepted, should be redrafted, and undergo a 2nd version review.				
Any other remarks				

Task Management Table

Annex VII: Task Management Template

Task Management Template XR4ED_Task_Management_Template.docx

ACTION LIST				Last Update: [date]		
#	WP	Action	Responsible	Date	Status	Comments

Where Status: Pending / Completed