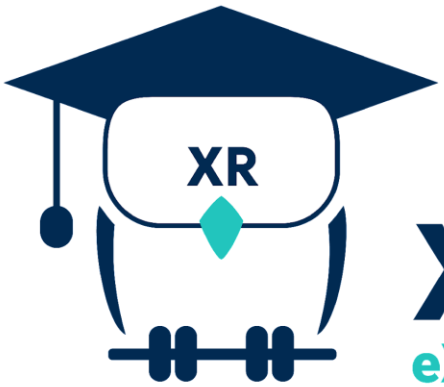
Ref. Ares(2024)8550949 - 02/12/2024

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



XR4ED
eXtended Reality for EDucation

D4.3
XR4ED platform prototypes

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the European Union

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	https://xr4ed.eu/

Funded by
the European Union

Partners

CYENS CENTRE OF EXCELLENCE	CYENS	RESEARCH	CYPRUS
konnektable TECHNOLOGIES	KONNEKTABLE	SME	IRELAND
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SIMAVI	Software Imagination & Vision SRL	SME	ROMANIA
UPC	Universitat Politecnica de Catalunya	RESEARCH	SPAIN
CELLOCK	CELLOCK	SME	CYPRUS

Document information

Related work package	WP4	
Document reference	D4.3	
Related deliverables	D4.3	
Type	✓	DEM - Demonstrator, Pilot, Prototype
		DMP - Data Management Plan
		R - Document, Report
Status	Final	
Version	1.0	
Due date	30/11/24	
Submission date	02/12/24	
Lead partner	NURO	
Contributing partners	NURO	
Reviewers	CYENS	
Keywords		

Dissemination level	
✓	PU: Public
	SEN: Sensitive

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Revision History

Document History			
Version	Date	Change editors	Changes
0.1	30/10/2024	Yash Shekhawat (NURO)	Initial version of the document
0.3	15/11/2024	Holger Kuerten (NURO)	Inputs in various sections
0.4	30/11/2024	Yash Shekhawat (NURO)	Final version for review
1	02/12/2024	Fotis Liarokapis (CYENS)	Final Version

Quality control		
Role	Partner (short name)	Approval date
Deliverable leader	Nurogames	30/11/2024
Quality manager	Dr. Fotis Liarokapis	02/12/2024
Project coordinator	Dr. Fotis Liarokapis	02/12/2024

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List of acronyms

Acronym	Description
XR4ED	Extended Reality for Education
XR	Extended Reality
VR	Virtual Reality
API	Application Interface
DRM/CRM	Digital/Content Rights Management

Executive summary

The XR4ED project aims to revolutionize education by creating an extended reality (XR) platform that empowers educators and learners to design, interact with, and experience immersive 3D educational environments. Deliverable D4.3 focuses on presenting the platform prototypes, highlighting their functionality, accessibility, and contributions to the overall project goals. This deliverable details the key components of the XR4ED platform: the World Builder, Portal Hopper, and Marketplace.

The World Builder is a robust tool for creating interactive 3D content, allowing users to customize and integrate diverse assets into immersive worlds. The Portal Hopper complements this by enabling seamless visualization and interaction within these environments across various devices, including VR headsets. The XR4ED Marketplace serves as a centralized hub for discovering, managing, and acquiring XR content, enhancing the educational and collaborative potential of the platform.

This document provides insights into the platform's prototypes, their technical capabilities, and their alignment with the broader objectives of fostering XR adoption in education. By bridging technical complexity and user-friendliness, XR4ED prototypes aim to make immersive education accessible to all stakeholders.

1 Introduction

1.1 Overview

Deliverable D4.3 is dedicated to showcasing the prototypes of the XR4ED platform, which embody the project's vision of enabling intuitive creation, management, and interaction within XR environments for educational purposes. These prototypes include the World Builder, Portal Hopper, and Marketplace, each contributing to the platform's goal of providing educators and learners with cutting-edge tools for immersive education.

The World Builder facilitates the creation of interactive 3D environments with ease, even for non-technical users. The Portal Hopper enhances user engagement by enabling them to explore and interact with these environments in various modes. The Marketplace serves as a repository of XR assets, ensuring access to a wide range of educational and collaborative tools

1.2 Structure of the Document

The document is structured as follows:

- Executive Summary: A concise overview of the deliverable's purpose, scope, and highlights.
- Introduction: Provides background on the deliverable, its goals, and its organization.
- XR4ED Main Components: Describes the World Builder, Portal Hopper, and Marketplace, detailing their features and functionalities.
- Demos and Features: Elaborates on the documentation and demonstrations available for the platform's components.
- Conclusion: Summarizes the deliverable and its implications for the XR4ED project.

2 XR4ED Main Components

2.1 XR Module

Purpose: A core component of XR4ED, enabling users to create, visualize, and interact with immersive 3D content for education and other applications.

Key Features:

- **World Builder:** A user-friendly editor for creating 3D environments, enabling the import of assets (e.g., models, audio, textures) and setting up interactive behaviors.
- **Portal Hopper:** A visualization tool that allows users to explore the created environments in VR, 3rd-person, or 1st-person perspectives across multiple platforms.
- **Interaction Editor:** A tool for defining user interaction rules, goals, and sequences within the 3D world.
- **Templates and Plug-ins:** Predefined environments like classrooms or labs and extendable functionalities for specialized needs.
- **Test Environment:** Verifies and tests the functionality and visuals of the created worlds.

2.2 Marketplace

Purpose: A centralized hub for managing and accessing XR content and assets.

Key Features:

- **Product Management**: Uploading, categorizing, and describing XR assets.
- **Content Distribution**: Access to educational materials, 3D models, and environments.
- **Transactions**: Includes shopping carts, checkouts, and secure payment processing.
- **Digital Rights Management (DRM)**: Ensures content is used under proper licensing agreements.

2.3 Avatars and Templates

Avatars:

- Enable personalization and representation in virtual worlds.
- Facilitate interaction and engagement in collaborative XR settings.

Templates:

- Pre-designed environments (e.g., classrooms, labs) to accelerate content creation.
- Offer flexibility for customization based on educational needs.

3 XR4ED Demos and Features

3.1 Xr4ed World Builder and Portal Hopper

World Builder Features

1. Cross-Platform Support
    a. Compatible with multiple platforms (Windows, macOS, etc.).
2. Project Management
    a. Tools for creating, exporting, and publishing 3D worlds.
3. Customizable Settings
    a. General settings, shortcuts, tools, and themes customization.
4. World Editing
    a. Scale, rotate, and move objects.
    b. Add lighting, skyboxes, and environments.
5. Asset Management
    a. Import 3D models, images, textures, audio, videos, and PowerPoint slides.
    b. Material creation and library support.
6. Multi-User Collaboration
    a. Shared environments with multi-user setups.
7. Interactive Logic and Behavior
    a. Create and edit logic rules for interactive elements using a node-based editor.
    b. Define signals and flows for triggering events.
8. Template System
    a. Pre-designed templates for quick creation of standard environments like classrooms or labs.
9. Extensibility
    a. Add plugins, templates, and wizards for customized features.
10. Testing Environment
    a. Test worlds in different modes before publishing.
11. Version Control
    a. Integrated Git support for managing project versions.

Portal Hopper Features

1. Cross-Platform Operation
    a. Compatible with PC and VR platforms.

2. View Modes
    a. Supports first-person, third-person, and VR modes.
3. VR Headset Compatibility
    a. Works with various VR devices for immersive experiences.
4. Intuitive Navigation
    a. Keyboard, mouse, and VR controller support.
5. Immersive Playback
        i. Render and interact with 3D worlds created in World Builder.
6. Multi-User Support
    a. Explore worlds in shared or collaborative setups.
7. Streamlined Installation and Setup
    a. Easy-to-follow installation guides for different platforms.

Documentation

The complete documentation of the project is available at https://www.portalsunited.com/docs/ and is regularly updated when new features are implemented.

Demos

The demo for both the tools are available at https://www.portalhopper.com/xr4ed/ with installation and update instructions.

3.2 Xr4Ed Marketplace

Features

1. Product Management
    a. Upload and manage XR-related products, including descriptions, metadata, and categorization.
    b. Organize products into categories for easy navigation (e.g., 3D models, immersive environments, educational resources).
2. Content Discovery and Distribution
    a. Browse a wide variety of XR content, such as 3D assets, avatars, and interactive modules.
    b. Search and filter tools for quick access to relevant resources.

   c. Visual previews of assets and environments.
3. Shopping and Transactions
   a. Add items to a shopping cart for a streamlined purchasing experience.
   b. Secure checkout process for transactions.
   c. Integration with multiple payment gateways for user convenience.
4. Digital Rights Management (DRM)
   a. Licensing control for purchased assets, ensuring proper use and distribution.
   b. Automated license key generation and expiration tracking.
5. User Accessibility
   a. Designed for educators, students, and developers to access XR resources easily.
   b. Intuitive and user-friendly interface.

Documentation

The marketplace has a built-in helpdesk and FAQs for common issues as well as tutorials for effective usage.

Demos

The Marketplace is available here: https://xr4ed.cellock.com/

4 Conclusion

The development of XR4ED platform prototypes marks a pivotal milestone in the project's journey toward transforming education through XR technologies. The World Builder, Portal Hopper, and Marketplace collectively represent a comprehensive suite of tools designed to address the diverse needs of educators, learners, and content creators.

By simplifying the creation and interaction with immersive environments, the prototypes lower the technical barriers traditionally associated with XR technologies. The platform's integration of user-friendly interfaces, multi-device compatibility, and a robust asset management system ensures accessibility and scalability for diverse educational contexts.

As XR4ED progresses, these prototypes will serve as the foundation for further enhancements, reflecting the project's commitment to fostering innovation in education. Through these efforts, XR4ED seeks to empower users, promote collaborative learning, and advance the adoption of XR in classrooms and beyond.

References