Zenith Outdoor/Indoor Experience

May 2025 – April 2027 (24M)

Project 2024-1-CY01-KA220-ADU-000256958

D2.1 Pilot test procedure and feedback design

Authors	*AUTH*
Abstract	*The present deliverable provides a synopsis of the approach that is to be adopted for the purpose of testing the system mock-ups and prototypes. The aim is to ensure that each development cycle is systematically evaluated, refined, and validated before progressing to the next stage. The testing process will be divided into **three key phases**: The **mock-up phase**, the **initial prototype phase**, and the **second prototype phase**. Each phase will implement methodologies commensurate with the system's maturity level. The following activities, methodologies, and expected outcomes have been planned in relation to the implementation of the ZOE project. The text delineates the strategic objectives pursued within the respective work package, which are designed to facilitate inclusive access to cultural education through the integration of augmented reality, 3D simulation technologies, and user-oriented navigation systems..* *Moreover, this document reflects the collaborative and interdisciplinary nature of the project, highlighting the contributions of each partner involved. Preliminary results, identified challenges, and next steps are also discussed to provide a comprehensive understanding of the work completed and the direction forward. The deliverable is aligned with the broader goals of the Erasmus+ programme and contributes directly to the promotion of lifelong learning, digital heritage, and innovation in adult education.*

THE CONSORTIUM

No.	Abbreviation	Partner Name	Logo
1	**GEO**	Geoimaging ltd	
2	**AUTH**	Aristotle University of Thessaloniki	
3	**TUW**	Technischen Universität Wien	
4	**VIR**	Virtual Solutions	

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GLOSSARY

GDPR	General Data Protection Regulation
AR	Augmented Reality
UX	User Experience
UI	User Interface

1. INTRODUCTION

The objective of this deliverable is to outline the structured approach that will be used to test the system mock-ups and prototypes. This approach will ensure that each development cycle is carefully assessed, improved, and validated before moving on to the next stage. **The testing process comprises three main phases: Mock-up Testing, 1st Prototype Testing, and 2nd Prototype Testing.** Each phase will employ suitable methodologies tailored to the system's level of maturity.

The target audience are both **end users** (tourists, cultural enthusiasts, and educators from different backgrounds) and **stakeholders** (such as cultural institutions, tourism agencies, and local governments) to collect their insight. The timeline for these activities is presented in the table below.

Name of activity	Month	Target (end users/ stakeholders)
Field test of system mock-up	M7-M8	20 + 5
Field test of 1st prototype	M13-M14	30 + 10
Field test of 2nd prototype	M19-M20	40 +15

Table 1. Timeline of pilot testing

2. PILOT TEST PROCEDURE

The pilot testing methodology follows a **progressive validation framework**, aligned with the system's maturity level and the principles of user-centered design. Each testing phase combines qualitative and quantitative evaluation techniques to ensure iterative refinement and evidence-based improvements.

Across all three phases, the following transversal principles apply:

- Iterative improvement cycles (test → analyse → refine → re-test)
- Mixed-methods data collection (quantitative & qualitative)
- Documentation of findings in structured issue logs
- Cross-partner validation and technical review meetings
- Ethical compliance and GDPR alignment (as defined in D1.2)

2.1 Field test of system mock-up

During the mock-up stage, the focus will be on validating the system concept, layout, navigation flow, and overall user experience. Low-fidelity and high-fidelity mock-ups will be tested using usability evaluation methods such as heuristic evaluation, cognitive walkthroughs, and user feedback sessions. Stakeholders and representative end-users will be invited to review the interface design and provide qualitative feedback through structured interviews and questionnaires. **The goal at this stage is to identify usability issues, unclear workflows, missing features, and design inconsistencies before development resources are heavily invested**.

The mock-up material will be prepared by VIR in M5, M6 and take place in M7 and M8. Participants both from Greece and Austria are going to take part. AUTH is responsible for data collection.

At this stage, the focus is on visual identity and information architecture. Since mock-ups are static and low fidelity, testing centers on "look and feel" rather than functionality. This encourages the users to focus on how the system works rather than critiquing the overall appearance.

This phase aims to identify:

- Usability issues
- Unclear workflows
- Missing or misaligned features
- Design inconsistencies
- Information architecture gaps

Regarding the process, end users and stakeholders are given the mockup in digital format and asked to review the usability. The evaluation will also contain 5-Second Tests, where users view a screen briefly to see if the core message or primary call-to-action is immediately clear.

2.2 Field test of 1st prototype

The first functional prototype will undergo pilot testing to assess core functionality and system performance. This phase will use black-box testing to validate system

requirements against expected outputs, along with basic functional and integration testing to ensure system components interact correctly. Selected users will participate in controlled pilot sessions where they perform predefined tasks while their interactions are observed and recorded. **Data collection methods will include task completion rates, error tracking, time-on-task measurements, and post-test surveys**. The objective is to identify: Technical inconsistencies, Performance instability, User confusion during interactive tasks and Early-stage accessibility barriers

All findings will be documented in a structured issue-tracking system and prioritised for correction before advancing to the second prototype.

2.3 Field test of 2nd prototype

The second prototype, being more refined and feature-complete, will be subjected to more rigorous evaluation. This phase will include user acceptance testing (UAT), performance testing, and limited real-environment deployment. A broader group of end-users will be involved in pilot testing to validate system reliability, efficiency, security, and overall readiness for implementation. Quantitative metrics such as system response time, error rates, and user satisfaction scores will be analyzed alongside qualitative feedback. Any critical defects identified will be prioritized for correction before final deployment. This stage determines readiness for final deployment and ensures alignment with the pedagogical objectives of ZOE.

3. FEEDBACK DESIGN

The feedback collection framework is designed to ensure:

- Standardised measurement across phases
- Comparability of results
- Evidence-based decision-making
- GDPR-compliant data handling

A mixed-method feedback model will be adopted. All data will be collected, processed, and stored in strict accordance with the procedures outlined in respective Deliverable D1.2, "Ethical and Legal Issues," and in full compliance with applicable GDPR regulations.

3.1 Quantitative feedback tools

Structured questionnaires will be deployed including likert-scale usability questions, system Usability Scale (SUS) adapted items, interface clarity and accessibility evaluation. More quantifiable feedback will be collected through "5-Second Tests", during which users will view a screen for a brief moment to ascertain whether the core message or primary call-to-action is immediately apparent. Scores will be aggregated into overall Usability Index and User Satisfaction Score. These indicators will allow comparison between:

- Mock-up vs 1st prototype
- 1st vs 2nd prototype
- Cross-country pilot results

3.2 Qualitative feedback tools

To complement quantitative results, qualitative data will be collected via open-ended questionnaire responses, short debrief interviews and observation notes during pilot sessions. This approach allows the identification of latent user needs and contextual interpretation of usability scores.

4. SUMMARY AND CONCLUSIONS

Throughout all cycles, an iterative testing methodology will be followed, ensuring that feedback from each stage guides the improvements in the next version. Documentation of findings, issue tracking, and continuous stakeholder engagement will support transparency and quality assurance. This structured and phased approach ensures that the system evolves systematically, minimizing risks while maximizing usability, performance, and overall project success.

In conclusion, the final product will be evaluated to ensure that both its functionality and visual design effectively meet users' needs and expectations. All core features will be verified to operate reliably and efficiently, enabling users to complete their tasks accurately and with ease.

Furthermore, the overall appearance and interface design will ensure clarity, consistency, accessibility, and intuitive user experience. Feedback gathered throughout

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the testing phases will be systematically incorporated into the development process, resulting in a user-centered solution that balances technical performance with usability and aesthetic quality.

ANNEX 1: TEMPLATE OF CONSENT AFTER INFORMATION

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CONSENT AFTER INFORMATION
Version 1.0, 4 November 2020

I. INFORMATION SHEET

Study title: Field test of system mock-up
Implemented in the context of the project: Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D platform [ZOE]

Principal Investigator: Aristotle University of Thessaloniki

Funding Organisation: ERASMUS+ PROGRAMME Project 2024-1-CY01-KA220-ADU-000256958

Data Controller: Aristotle University of Thessaloniki **(AUTh)**

Names of the coordinators of the research/scientific coordinator: Efstratios Stylianidis Professor Faculty of Engineering

Email: sstyl@auth.gr
TeL:2310995973
Address: Aristotle University of Thessaloniki
Faculty of Engineering
School of Spatial Planning and Development
Laboratory of Geoinformatics
University Campus
54124 Thessaloniki
Greece

Data Protection Officer (DPO): data.protection@auth.gr

Important Information

You will be given information on the research that is being conducted and you will be invited to take part in the study which is part of Work Package 2: **"User requirements, pilot testing and result evaluation" and specifically the activity called "Field test of system mock-up"** implemented in the context of the ZOE Project.

Your participation is voluntary.

The project "ZOE-Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D platform" which is funded by the Erasmus+ programme (KA220-ADU - Cooperation partnerships in adult education) aims to enhance cultural learning through outdoor AR tours, indoor 3D experiences and a customised navigator that leads the user through sites of interest, all in a gamified environment that keeps the users motivated and eager to engage. The main goal is to achieve high quality, flexible, lifelong and innovative adult education learning for diverse audience, cultural appreciation through enriched experiences, and digital heritage preservation in an appealing interactive environment. You can talk about this study and the consent form with other people such as family/friends/or whoever you feel comfortable with. You do not have to decide right away. You can decide whether you want to take part in the study after you have thought/ discussed this.

There may be words you do not understand or some things you would like for me to explain to you in detail. You can stop anytime and ask questions.

Purpose: Why are we conducting this study?

In the framework of the ZOE Project, we need understand better the user preferences and their perspective in the ZOE platform regarding the functionality and the appearance, at the stage which is already has been implemented. We are conducting this questionnaire with end users (tourists, cultural enthusiasts, and educators from different backgrounds) and stakeholders (such as cultural institutions, tourism agencies, and local governments) to collect their insight.

If your personal data will be further processed, or if the purpose of processing your personal data is changed or a new purpose is added you will be notified accordingly.

Subject Selection: Why are we requesting your participation?

You have been invited to take part in this questionnaire because you have been identified as a profile which can contribute to our research and give us insight of ZOE Platform as users and stakeholders in cultural heritage applications.

Your participation is voluntary: Do I have to do this?

You do not have to take part in the study if you don't want to. Even if you say "yes" now, you can change your mind later and pull out of the study at any time.

Participation cost: What will this cost me?

Your participation in the interview does not involve any cost.

Procedure: What will happen if you take part in the study?

If you accept our invitation to take part in the study you will be given a short questionnaire after visiting the https://app.project-zoe.eu/, in which the platform is hosted. We will ask you to sign an Informed Consent Form and you will be given this Information Sheet to keep along with a copy of your signed Informed Consent Form. During the interview you will be asked about your views on cultural heritage platforms and your requirements as a potential user. You may choose to not answer to any question that you do not feel comfortable with. The survey will not last more than 10 minutes.

Data: What kind of data will be collected?

During the interview, the information to be collected refers to:

- Some basic demographics (gender, expertise)
- Your opinions on the subject matter.

The questionnaire will be implemented online or in person.

The personal data and the questionnaires will be handled in accordance with the GDPR and will be stored securely up to 5 years after the end of the project i.e., 30/04/2032.

Who will receive or to whom maybe distributed the collected personal data?

Your personal data will be received by the AUTh ZOE team.

Personal data is intended not to be transferred to a third country or to an international organisation provided that in any case appropriate safeguards are taken.

Risks: Is this bad or dangerous for me?

There are no risks involved in this study.

Benefits: Will this be beneficial for me?

By participating in this interview, you will be contributing to our research.

Sharing the results: Will you inform me on the conclusions?

When the research is finished, I will be able to explain to you everything we have learned. An informational brochure will be available upon your request. Later on, we will inform other people about the research we have made and what we have found. This will be accomplished by writing project deliverables, articles and meeting with people that are interested in what we do.

Right to refuse or withdraw: I can choose not to be part of this study? Can I change my mind?

Your participation is not forced. You can stop the research at any time if you wish.

Consent is provided for 5 years after the completion of the project until it is revoked by sending an e-mail to sstyl@auth.gr or by sending the application form enclosed at the end of this document to the address of the coordinator of the research/scientific. The right to withdraw consent at any time does not affect the lawfulness of the processing based on the consent given before its withdrawal.

Data managing

The processing of your personal data is based on consent to this processing for specific purpose. Your personal data will be stored and protected in the secure infrastructure and services provided by the IT Center of AUTh where modern firewalls are used, and strong security practices are applied. The access of the project team members to the information system in which the data will be collected and stored will be done exclusively with authorized access.

You have the right to request from the Head of the Research access to or rectification or erasure of your personal data or restriction of processing concerning your data or to object to processing as well as the right to data portability. For any enquiry or guidance regarding your rights, you could send an email to sstyl@auth.gr or phone at 2310-995973. Any change in your personal data will take place within 30 days of your communication with the Principal Investigator.

If you have any questions about your personal data and your relevant rights or if you believe that your rights are being violated, you can contact the Data Protection Officer of the Aristotle University of Thessaloniki (data.protection@auth.gr). For additional protection you have the right to lodge a complaint with the Hellenic Data Protection Authority (www.dpa.gr).

If you finally decide that you would like to take part in the study you will receive a copy of this sheet.

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II. CONSENT

Field test of system mock-up
Implemented in the context of the project ZOE
Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D platform

I the undersigned ……

I declare that:

- I have been adequately and comprehensively informed by …… (name and position/area of responsibility of the researcher) for the purposes of the research in which I will participate and which is part of the research project ZOE - Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D platform related to 10593 code attributed by ELKE .
- I have been adequately and comprehensively informed about the method and sources of the research financing.
- I have been adequately and comprehensively informed about what my participation in this research entails. In particular, I have been informed of all the rights and obligations I will have as a participant in the research comprising the obligation of confidentiality (if the latter is required).
- I have been adequately and comprehensively informed about any positive or directly negative, short-term or long-term consequence my participation in this research is expected to have concerning me or in relation with third parties.
- I have been adequately and comprehensively informed about how my personal data related to this research is processed and protected.
- I am aware of the fact that my participation is voluntary and that I can withdraw my participation from the research at any time for any reason and without any impact on me (as well as of the fact that the same applies to the person I represent).
- I know the Head of the research to whom I can address to withdraw my participation from this research or to notify any potential problem that might arise during my participation or after the completion of this research.
- No pressure was exerted to me and I was given enough time to think and decide.

I consent to participate in the above research.

Participant's Signature: _____

Date:_____

day/month/year

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III. WITHDRAWAL OF CONSENT OF THE PARTICIPANT

User requirements survey
Implemented in the context of the project ZOE
Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D platform

I the undersigned ……

hereby withdraw my consent concerning my participation the research study "Zenith Outdoor/Indoor Experience for Cultural Tours with AR technology and 3D

platform [ZOE] ", which I had given on _____/_____/_____

_____

Signature of the participant or Signature of the legal guardian

Date: ____/____/____ (day/month/year)

_____

Full name