European Commission

ReInHerit

Redefining the Future of Cultural Heritage, through a disruptive model of sustainability

ReInHerit
Redefining the Future of Cultural Heritage

www.reinherit.eu

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Project

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Acronyms and abbreviations

Field of View	**FOV**

Disclaimer

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Contents

Executive Summary

The Smart Tourism Hackathon was co-organized by two EU-funded projects, ReInHerit and DiGiNN, on the 21st and 22nd of January in Nicosia, Cyprus, at the CYENS Centre of Excellence. The Hackathon was a unique opportunity for tech enthusiasts, cultural heritage and museum experts, and enthusiasts to come together and brainstorm to create innovative solutions on how we experience museums and cultural heritage sites. Teams were tasked with developing cutting-edge projects that leverage technology to improve visitor experiences, promote sustainable tourism practices, and optimize destination management.

D7.12 : Cultural Hackathon Report

1 Introduction

The primary aim of the Smart Tourism Hackathon was to devise inventive solutions geared towards enriching visitor experiences at museums or cultural heritage sites through the application of cutting-edge technology within the realm of Smart Tourism.

1.1 Objectives

The objectives of the Hackathon were the following:

a) Promote cross-functional collaboration across engineering and non-engineering teams.

b) Generate high-value, actionable business ideas and product concepts.

c) Boost innovation culture.

d) Establish idea-sharing, effective collaboration, and creativeness driven by enthusiasm towards a shared goal.

e) Identify Talent.

2 Problem/Challenge addressed during the Hackathon

The overall goal of the Smart Tourism Hackathon was to provide new innovative solutions, using cutting-edge technologies to enrich the visitor experiences in museums and heritage sites and to attract new audiences in the context of cultural tourism.

Incorporating and cultivating such a technological dimension in aspects of the museum experience may not always be as smooth as in other areas of everyday life in which these technologies are used. Apart from practical or other challenges it appears that in many cases the attempts towards a digital transformation of museums may also affect the very nature of the museum experience offered to visitors in unexpected ways. Thus, another goal of the hackathon was to address these possible problems or challenges related to the application of technologies in this context through innovative solutions. To do so, the hackathon aimed to engage an interdisciplinary and diverse group of professionals and offer then an open and collaborative space to experiment, share, co-create, and innovate so as to create an interdisciplinary project.

Participants were encouraged to design ideas that would allow museum and heritage sites visitors to explore digital and physical exhibits within the museum/site space and to also interact and engage in these spaces or exhibits holistically, i.e., in a specially designed multi-media experience, which is site-specific, exhibit-specific, time-limited,

adaptable according to audience numbers and behavior, yet unique and deeply personal for each visitor that comes into the space. The aim was to design projects that would allow the use of the venue's indoor and outdoor spaces to allow people to experience them and interact with both the exhibits and also with other visitors, also adding a social element to the experience, which is extremely important for museum visits.

Quite importantly, the hackathon aimed to create projects that would help museums to attract new audiences, especially audiences coming from a younger demographic, mainly teenagers and young adults, who would not be typically drawn to cultural heritage sites and museums, and to make them want to return to the museum on other occasions and under different circumstances. This would contribute to the creation of a new generation of museum and cultural heritage site visitors, to set the foundations for increasing visitor numbers in future projects of the particular museums as well. This need is even more pressing after the pandemic, since current young audiences and teenagers may return now for the first time to museums and heritage sites, and depending on their age, this might be the first museum visit they conduct in person. Therefore, the ReInHerit Hackathon aimed to address this need by encouraging the creation of projects that would allow visitors to actively engage with space, using interactive technology and gamification techniques as demonstrated in the smartphone app, so that they are more inclined to visit these spaces.

To better achieve this, the goal was for each Hackathon team to have a diverse group of professionals, artists, archaeologists, computer scientists, etc so that the final ideas/projects can combine elements from different disciplines. The final projects would be informed by a cultural heritage site that grows within, respects, and helps enhance pre-existing exhibitions and museum spaces. After the ReInHerit Hackathon, cultural heritage professionals can find resources and training material to foster and support cultural tourism in museums and heritage sites and a networking platform to connect and exchange experiences.

3 Achievements for the Cultural Hackathon

The expected achievements for the Smart Tourism Hackathon were novel ideas and projects to connect technology with museums and cultural heritage sites.

For cultural preservation, the goal was the development of apps, digital tools, or platforms to promote museums, cultural heritage buildings/sites, or historical landmarks.

4 Main Outcomes of the Hackathon

The outcomes from the event resulted in innovative ideas: Develop innovative ideas, creative solutions, and novel products that could contribute to improving smart

tourism. At the same time, creating teams with interdisciplinary backgrounds (software engineers, developers, designers, architects, and others) and connecting with like-minded individuals to share ideas and produce solutions increases the value of collaboration.

4.1 Introduction

In the Smart Tourism ReInHerit Hackathon, participants were expected that their submitted idea/project should provide the following:

4.1.1 App Prototypes

Develop and demonstrate a functional app. Participants presented their ideas on how an app could be a tool to improve the user experience in specific spaces such as museums or cultural sites. Reach Technology Readiness Level 3 (TRL3), Proof of Concept, presented the basic idea, concept, and prototype to demonstrate the app's feasibility.

4.1.2 Business Ideas

Participants presented a business model plan based on the Business Model Canvas methodology. They addressed their business proposal's value proposition, customer segments, customer relationships, channels, key activities, essential resources, key partners, cost structure, and revenue streams.

4.1.3 Game prototypes

Participants could choose to develop a game idea related to museums and the historical artifacts or people related to them. It was essential that this game could be used in conjunction with an existing physical/digital museum to a) enhance the experience of visitors, b) educate about the content of the museum and the history of its artifacts, or c) educate about the history of the museum itself or d) educate about the processes surrounding museums.

5 Target Audience/Participants

Everyone from below categories had the opportunity to participate in the Smart Tourism Hackathon:

- Multidisciplinary audiences including (but not limited to)
- Students from diverse backgrounds (Computer Science, Machine Learning AI, Architectural History History, Business Development, Product Development, Project Management, Marketing, etc.)
- Designers (Graphics, Digital Design, Architecture)
- Engineers (Computer Engineering)
- App/Software Developers
- Startups

- Cultural Heritage Professionals

6 Rules

The rules of the Smart Tourism Hackathon were available on the Hackathon's website (https://reinherithackathon.cyens.org.cy/) and were:

Participation had to be in person only. The team size could be between 3 and 5 people. Participants could not be mentors, volunteers, or judges at the event. To participate in the Hackathon, they had to register (https://www.eventbrite.co.uk/e/reinherit-smart-tourism-hackathon-2024-tickets-772143731687?utm-campaign=social&utm-content=attendeeshare&utm-medium=discovery&utm-term=listing&utm-source=cp&aff=ebdsshcopyurl) and join the hackathon's Slack channel (https://reinherithack-mru1533.slack.com/join/shared_invite/zt-29othrg4i-3Zo7gurMGk2JX3FuYA9Jwg#/shared-invite/email) to connect with other participants, form teams, contact the organizers and mentors, and receive updates. They could bring their ideas and code they had from before. Judges would only consider work completed during the Hackathon to evaluate the teams. They could use any technology (hardware or software) and programming language. They had to bring with them anything they needed during the Hackathon. Everyone was welcome: students from diverse backgrounds (Computer Science, Machine Learning AI, Architectural History, History, Business Development, Product Development, Project Management, Marketing, etc.), designers (Graphics, Digital Design, Architecture), engineers (Computer Engineering, App/Software Developers, Startups, Cultural Heritage Professionals). They had full ownership of whatever they built. Their solution had to fall within one of the challenges set for the Hackathon. It was expected that everyone participating in the event would follow the Code of Conduct (Figure 1 The code of conduct provided to the Hackathon's participants). Teams violating it would be disqualified. To fully submit their project, they had to provide:

For App Prototypes: Developed and demonstrated a functional app. Reached TRL3 (Proof of Concept), presenting the basic idea, concept, and prototype to demonstrate the app's feasibility.

For business ideas: Presented a business model plan based on the Business Model Canvas methodology. They should have been able to address their business proposal's value proposition, customer segments, customer relationships, channels, key activities, key resources, key partners, cost structure, and revenue streams.

For Game prototypes: Developed and presented a game idea related to museums and the historical artifacts or people related to it. This game could have been used with an existing physical/digital museum.

In addition to the project submitted, they were expected to give a 10-minute

presentation of their solution before the final evaluation. Submitted projects were assessed based on the following criteria: a) Originality of the idea, b) for apps and games: Technical Complexity and for business plans: completeness, clarity, and attention to detail, c) adherence to the topic of Smart Tourism, and d) usability and impact potential.

Our hackathon is a collaborative and inclusive space for innovation and creativity. To ensure a positive and respectful environment for all participants, we ask that you adhere to the following code of conduct:

1. Respect and Inclusivity:

Treat everyone with respect and kindness. Harassment, discrimination, or any form of offensive behavior will not be tolerated.

2. Inclusive Language:

Use inclusive and welcoming language. Be mindful of your words and actions, promoting an atmosphere that values diversity.

3. Collaboration:

Embrace collaboration and teamwork. Share ideas openly and contribute positively to group discussions.

4. Code of Ethics:

Adhere to ethical coding practices. Respect intellectual property rights and refrain from engaging in any malicious activities.

5. Safety First:

Prioritize safety and well-being. Report any concerns or incidents promptly to the event organizers.

6. Informed Consent:

Obtain consent before taking photos or recording participants. Respect others' privacy and ask for permission when sharing images publicly.

7. No Disruptive Behavior:

Avoid disruptive behavior that may interfere with the progress of other teams. Maintain a focused and productive working environment.

8. Compliance with Rules:

Follow the rules and guidelines provided by the event organizers. Non-compliance may result in disqualification from the hackathon.

9. Feedback and Critique:

Provide constructive feedback and be open to receiving critiques. Foster a culture of continuous improvement.

10. Reporting Concerns:

- If you witness or experience any violations of this code of conduct, report them immediately to the event organizers.

Consequences for Violations:

Violations of this code of conduct may result in warnings, expulsion from the event, or reporting to appropriate authorities, depending on the severity of the incident.

By participating in the ReInHerit Smart Tourism Hackathon you agree to abide by this code of conduct and contribute to a positive and inclusive experience for everyone. Thank you for helping create a vibrant and respectful hackathon environment!

Figure 1 The code of conduct provided to the Hackathon's participants.

7 Submissions of the Ideas and Projects

Teams were expected to submit their projects via DEVPOST (https://reinherit-hackathon.devpost.com/?preview_token=vvJbr8ywb34VeFhc05N3l22QJ0kzgZNQZGjSn3g4GYY%3D) on Sunday, 21/01, between 12:30-14:00. Following the project submissions, the teams presented/pitched their project ideas in front of Judges and other participants using a provided template.

Projects were evaluated based on the following criteria, with a focus on addressing these aspects:

a) Originality of the Idea

b) Technical Complexity (Apps and Games)

c) Completeness, clarity, and attention to detail (For Business plans)

d) Adherence to the topic

e) Usability and impact potential

8 Awards

The awards consisted of gift vouchers totaling 4000 in value:

Awards of value (non-monetary):

- 2500-euro First
- 1000-euro Second
- 500-euro Third

Also, there was an ECTN special prize: 'Destination of Smart Tourism'.

ECTN awarded an additional prize. The ‘Destination of Smart Tourism’ prize was given to projects with a specific reference to a cultural tourist destination in their output. A 'destination' could be a local area, a city, a region, or a museum/heritage site. There had to be an explicit reference to a geographical area or venue of cultural heritage. The ECTN award was 'Destination of Smart Tourism', accompanied by a monetary award of 1000 euros.

9 Mentors

The esteemed mentors of the hackathon, a group of seasoned professionals and experts in various fields who played a crucial role in guiding and inspiring participants with their wealth of knowledge and experience, were the following:

- Chiara Zuanni, Assistant Professor in Digital Humanities, University of Graz, Austria.

Short Bio: With expertise in Digital Museology, Digital heritage, social media research, Museum Studies, Public archaeology, Heritage studies, and Visitor studies, Chiara Zuanni's research focuses on data practices and digital media in the

heritage sector, on social media and digital cultures in memory institutions, and on the creation and mediation of knowledge in museums. She has a BA in Classics and an MA in Archaeology from the University of Bologna; a PhD in Museology from the University of Manchester. She has extensive experience in working on social media research approaches in the arts (strategies, engagement, data mining, evaluation of social media participation for heritage institutions). Besides, she has worked on projects relating to data practices in the cultural sector (Culture Metrics, Manchester University) cultural policy evaluation (Impacts18, University of Liverpool), history of collections and virtual exhibitions (Universal Histories and Universal Museums, V&A London).

- Kleanthis Neokleous, Research Group Leader, CYENS Centre of Excellence, Cyprus.

Short Bio: Dr. Neokleous is currently leading the ITICA MRG at CYENS since 2019, a multidisciplinary research group that explores innovative projects that focus on the combination of arts, technology and society. Kleanthis graduated from the University of Cyprus in June 2011, with a Doctorate in Computer Science and has a multi-disciplinary academic background in various fields including Virtual Reality and 3D graphics, Electronic Health (eHealth), Cognitive Psychology, Computational Neuroscience, Machine Learning, Intelligent Diagnostic Systems, Mechanical Engineering, Electrical/Control Engineering and Space Science and Technology. He has several years of experience in project management, and he was involved with the conception, design, preparation, writing and coordination of many National and EU research projects. During and after his PhD, Dr. Neokleous co-founded in parallel two innovative startup companies in Virtual Reality technologies and eHealth applications in line with his academic and research interests.

- Maria Shehade, Senior Research Associate, CYENS Centre of Excellence, Cyprus.

Short Bio: Dr Maria Shehade is a Senior Research Associate at the Museum Lab of the CYENS Centre of Excellence. She obtained her PhD in Cultural Heritage Management from University College London. She also holds an MA in Cultural Heritage Management from University College London and a BA in History, Archaeology and History of Art from the National and Kapodistrian University of Athens. Her research at CYENS focuses on the application of interactive and emerging technologies in museums and heritage sites, with a special emphasis on the visitor experience, and issues of presence, authenticity, immersion and engagement. She has also done research in multisensory experiences in museum environments and the visitors' sense of presence, which was the subject of a book she co-edited, entitled Museums and Technologies of Presence, which was published in 2023 by Routledge.

- Marco Bertini, Associate Professor in Computer Science, University of Florence, Italy.

Short Bio: Marco Bertini is an Associate Professor in Computer Science at the University of Florence, Italy. He is working at the Media Integration and Communication Center of the University of Florence. He received the Laurea Degree in Electronics Engineering (Laurea in Ingegneria Elettronica) from the University of Florence in 1999, and Ph.D. in 2004. His interests are focused on digital libraries, multimedia databases and social media analysis. On these subjects he has addressed semantic analysis, content indexing and annotation, semantic retrieval and semantic video transcoding. He is the author of 21 journal papers and 100 peer-reviewed conference papers. His Google Scholar H-Index is 23. He has been involved in 9 EU research projects as WP coordinator and researcher, among which ASSAVID, DELOS, IM3I, euTV, ORUSSI.

- Polina Nikolaou Research Associate, BoC Cultural Foundation, Cyprus.

Short Bio: Dr Polina Nikolaou studied history (National and Kapodistrian University of Athens) and cultural geography (University of Nottingham). She completed her PhD thesis on the diaspora of Cypriot antiquities in London and New York (1860-1900) at the University of Exeter. She has worked as a researcher at the Bank of Cyprus Cultural Foundation in the project "Redefining the future of cultural heritage, through a disruptive model of sustainability [ReInHerit]", which is funded under the European research program Horizon 2020. She has carried out postdoctoral research at the Department of Cultural Technology and Communication, University of the Aegean, as part of the project: "Cultural Heritage Sector: Bridging the Gap between Studies and Professions". Her work focuses on cultural heritage management from the 19th century onwards and explores the issues of a) the historical and theoretical relationship between archaeological artefacts, space and knowledge, b) history of archaeology and museum collections, and c) digital transformation, ethics and sustainability in the cultural heritage sector.

- Panayiotis Charalambous, Research Group Leader, CYENS Centre of Excellence, Cyprus.

Short Bio: Dr. Panayiotis Charalambous has been the team leader of the V-EUPNEA MRG of CYENS since June 2019. He was a Visiting Lecturer in the Department of Computer Science at the University of Cyprus during the academic year 2018-2019. Between 2016-2018, he worked as both an Associate Research Scientist and a Computational Scientist at the CaSToRC centre of the Cyprus Institute; there he worked on the crossroads of Computational Sciences and the Cultural Heritage communities. Between 2014-2016 he was a post-doctoral fellow at INRIA Rennes, France under the supervision of Dr. Julien Pettre where he worked on the development of novel algorithms for the authoring and simulation of human crowds. In 2014 he completed his PhD from the University of Cyprus under the supervision of Prof. Yiorgos Chrysanthou where he worked on the development of novel data-driven algorithms for Virtual Crowds. He got his BSc in Computer Science and Telecommunications from the National and Kapodistrian

University of Athens, Greece in 2002 and his MSc in Advanced Systems Technologies in 2005 from the same university. Dr. Charalambous worked as a researcher and engineer on several projects funded by Horizon 2020, RPF and other agencies. He is a member of the ACM, the Eurographics association, and has been a reviewer of several prestigious journals and conferences. Reviewer credits include journals such as ACM's Transactions on Graphics, Computer Graphics Forum, IEEE Transactions on Multimedia, IEEE Transactions on Visualization and Computer Graphics, and conferences such as Eurographics, Symposium on Computer Animation (SCA), Motion Interaction and Games (MIG) and CASA.

10 Judges

The distinguished panel of judges for the hackathon, a group comprised of accomplished professionals and industry leaders whose expertise and discernment played a pivotal role in evaluating and recognizing the outstanding projects presented by the participants, were the following:

- Manos Vougioukas, Secretary General, European Cultural Tourist Network (ECTN).
- Panayiotis Korinos, Bank of Cyprus, Innovation & Entrepreneurship Center.
- Theopisti Stylianou-Lambert, Associate Professor, Department of Multimedia, Cyprus University of Technology, & Museum Lab Team Leader, CYENS Center of Excellence, Cyprus.

11 Two-week Pre-Hackathon Event

Seven workshops/trainings were presented online, covering topics on app prototypes, business ideas, and game prototypes (Figure 2 Smart Tourism ReInHerit Hackathon Pre-Event Webinars calendar. These served as the main directions on which teams based their ideas. During the workshops/trainings, participants could ask questions about the tools and ideas. Seven presentations were given for each workshop/training direction, and a Q&A session occurred at the end. The presenters offered techniques for brainstorming and refining ideas. The workshops/trainings are added in the digital hub of the ReInHerit.

11.1 App Prototypes

They guided rapid app prototype development in the pre-hackathon workshop/training session. Discussions covered resources, prototyping tools, and best practices for quickly designing and developing an app. Presentations focused on strategies for identifying key features and functionality while validating and testing concepts. Participants were guided on developing and demonstrating a functional app, reaching the TRL3 level - Proof of Concept (basic idea, concept, and a basic prototype).

11.2 Business Ideas

The pre-hackathon workshop/training session inspired and guided participants in the art of creativity, setting the stage for a culturally enriched hackathon experience. In the "Cultivating Innovation: Business Idea Creation Prelude" workshop, participants embarked on a transformative ideation journey at the nexus of business and culture. Attendees gained tools to craft innovative business ideas that resonated globally by exploring diverse cultural perspectives, applying design thinking principles, and fostering cross-cultural collaboration. The workshop emphasized the importance of cultural sensitivity and guided participants in the art of storytelling for impactful presentations. Participants refined their ideas through a feedback-driven iterative process, leaving the workshop/training with a heightened ability to infuse cultural relevance into their entrepreneurial endeavors and a solid foundation for success in the subsequent cultural hackathon.

11.3 Game Prototypes

The pre-hackathon workshop/training session guided the tools and knowledge needed to bring gaming ideas to life by developing game prototypes. Presentations covered vital principles and considerations for effective game prototyping and game development. Participants were guided in developing a game idea related to museums and historical artifacts to enhance visitors' experience or education. They also learned about the creative process of building game prototypes in a short amount of time.

11.4 Webinar Summaries

The Webinars that happened are the following Figure 2 Smart Tourism ReInHerit Hackathon Pre-Event Webinars calendar.) and are all available to the ReInHerit Hub:

ReInHerit Hackathon Webinars					
Date	**Time**	**Title**	**Presenter**	**Partner**	**Venue**
1/8/2023	15:00-16:00 CET	Unleashing Creativity: Smart Tourism Hackathon - Transforming Museum Experiences through Innovation in Cultural Heritage	Styliana Gregoriou	CYENS	online via Zoom
1/9/2023	15:00-16:00 CET	Creating value for museums: heritage professionals' and audiences' requirements for digital technologies	Polina Nicolaou	BoCCF	online via Zoom
1/10/2023	15:00-16:00 CET	Immersive performances in Cultural Heritage sites	Kleanthis Neokleous	CYENS	online via Zoom
1/12/2023	15:00-16:00 CET	Museums post-COVID-19: reflecting on sustainability in cultural heritage digital transformation	Chiara Zuanni	Uni-Graz	online via Zoom
1/15/2023	15:00-16:00 CET	The ReInHerit Toolkit: Computer Vision and AI for Cultural Heritage	Marco Bertini	MICC	online via Zoom
1/17/2023	15:00-16:00 CET	Video games for Cultural Heritage: The case of the ReInHerit Museum Management Game	Panayiotis Charalambous	CYENS	online via Zoom
1/18/2023	15:00-16:00 CET	Exploring the potential of interactive and emerging technologies in museum environments	Maria Shehade	Cyens	online via Zoom

Figure 2 Smart Tourism ReInHerit Hackathon Pre-Event Webinars calendar.

08/01/2024: In this introductory webinar, the primary purpose of the ReInHerit Hackathon was explained, including who can join, what the deliverables are, and more

information on the following webinars.

09/01/2024: This webinar looked at the current museological approaches, focusing on ethics and how they relate to digital technologies in museums. It started with an introduction to museums, explaining their role and aspirations in societies. Then, it presented the current ethical issues relevant to digital applications. Finally, the audiences of museums were discussed by introducing data collected through the ReInHerit research.

10/01/2024: This webinar presented an overview of Immersive and Virtual Reality technologies in Cultural Heritage Sites.

12/01/2024: During COVID-19, many museums witnessed a so-called 'digital turn', developing many digital projects to maintain relationships with their audiences and foster engagement during the lockdowns. However, the long-term impact of these digital initiatives is yet unclear, with multiple challenges to their sustainability and the need to reconcile online and onsite experiences post-pandemic. This webinar discussed the potential and issues museums face in developing sustainable digital strategies and the areas to be further explored and researched to foster the sector's digital transformation.

15/01/2024: In this webinar, the Computer Vision and AI techniques used in the applications that are part of the ReInHerit toolkit were presented, considering the Smart Tourism Android application and discussing the types of interactions and functionalities of the main applications to ease the design and development of new applications from the open-source toolkit.

17/01/2024: Dr. Panayiotis invited everyone to Join us to explore the fusion between modern technology and cultural heritage as we delve into the world of video games! In this webinar, he took us on a fascinating journey through video games within cultural heritage institutions. Discovered how video games are becoming powerful tools to engage and educate audiences about cultural heritage, learned about the process behind our implementation of the ReInHerit Museum Management game that utilizes many technologies such as Artificial Intelligence, Game Engines, 3D modeling, and reconstruction, and saw how we make this process more accessible to institutions that are interested in doing something similar.

18/01/2024: The aim of this webinar was twofold. First, it aimed to provide an overview of different examples of technologies currently used in museum environments, such as interactive kiosks, touch screens, mobile applications and virtual or augmented reality applications and analyse their potential advantages for the museum and its visitors. Second, it aimed to critically examine and assess the potential limitations and challenges caused by the use of these technologies and explore how these challenges can be addressed, highlighting particular future directions, so that new technologies can be used in more effective and creative ways.

12 Agenda

The agenda provided to the participants was the following (Figure 3 Agenda of the Smart Tourism Hackathon 1/2. & Figure 4 Agenda of the Smart Tourism Hackathon 2/2.):

Smart Tourism Hackathon

20-21 January 2024,

CYENS Centre of Excellence

Dimarchou Lellou Demetriadi, 23 Nicosia 1016, Cyprus

AGENDA

Saturday, January 20

08:30 – 09:00

Registration

- Welcome participants and provide event materials
- Networking
- Final team forming

09:30 – 10:00

Kick-off, Welcoming remarks, Niki Kyriakou, Project Manager, CYENS

- Introduction to ReInHerit Project and the hackathon
- Overview of goals and expectations
- Introduction of the mentors and judges
- Description of the agenda and important times such as meetings with the mentors

10:00-10:30

Empowering the Tourism Industry through Digital Transformation, Dr Katerina Loizou, DiGiNN Project Manager, The Cyprus Institute

10:30-11:00

Smart tourism, Smart destinations and Cultural Heritage, Dr Manos Vougioukas, Secretary General, European Cultural Tourism Network

11:00 -12:00 Teams start working

- Participants are grouped into teams, and they start working on their project

12:00 – 13:00 Teams continue working/ parallel presentations of ideas to the mentors and meetings with mentors.

- Participants keep on working and can have short sessions pitching their ideas to the mentors. During the short pitching sessions, the participants should be able to define whether they will propose a business idea, an app prototype or develop a game prototype. They can also pitch their initial idea to mentors and receive feedback.

13:00 – 14:00 Lunch

14:00 – 18:00 Continue working

18:00 – 19:30 Meetings with Mentors

- Participants will present their ideas to the mentors and receive feedback for improvements

19:30 Dinner

19:30 – 00:00 Continue working

- Participants will be able to keep on working throughout the night

Figure 3 Agenda of the Smart Tourism Hackathon 1/2.

Sunday, January 21

00:00 – 08:00 Teams working

- Participants will be able to keep on working throughout the night

08:00 – 09:00 Coffee and Breakfast

- Breakfast and networking

09:00 – 12:30 Teams continue working/ Wrapping up

- Participants should work on finalizing their projects
- Technical checks and rehearsals
- Teams prepare for presentations.

12:30 – 14:00 Final project submission (through Devpost)

13:00-14:00 Lunch

14:00 – 15:00 Final Teams' presentations

- Teams present/pitch their project ideas in front of Judges and other participants

15:00-15:30 Coffee break

15:30 – 17:00 Evaluation committee meets

- Voting and process to select final projects (through Devpost)

17:00 – 19:00 Closing Ceremony

- Winners announced
- Distribution of awards
- Closing Remarks
- Networking

The event is co-organized by ReInHerit and DiGiNN projects. The ReInHerit project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004545. The DiGiNN project has received fundng from the European Union's Digital Europe Programme (DIGITAL) under grant agreement 10108377.

ORGANIZERS

CYENS CENTRE OF EXCELLENCE

ReInHerit

DiGiNN

European Commission

Figure 4 Agenda of the Smart Tourism Hackathon 2/2.

13 Smart Tourism Hackathon Website

The Hackathon website (Figure 5 A Screenshot of Smart Tourism ReInHerit Hackathon Website.) was the primary source of information for the public, including all the details about the Hackathon. The website was developed on WordPress and was launched on December 14, 2024.

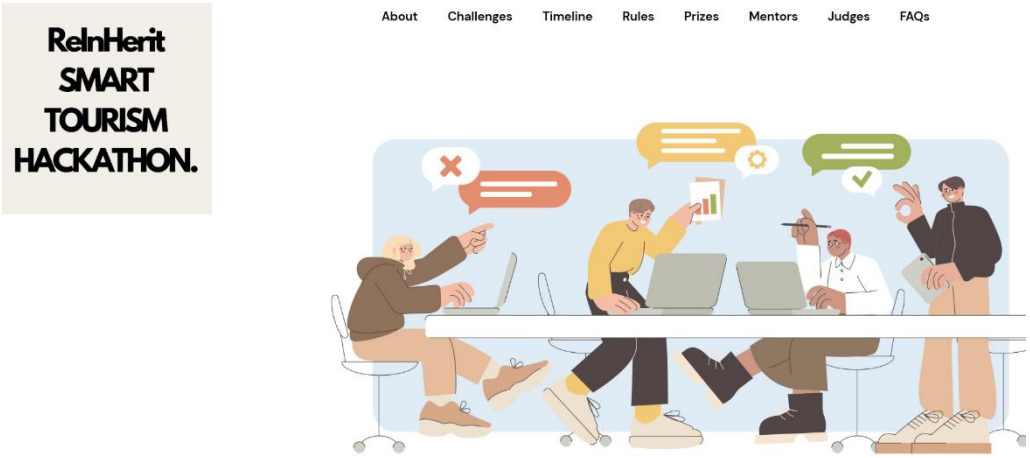


Figure 5 A Screenshot of Smart Tourism ReInHerit Hackathon Website.

13.1 Key Features

13.1.1 Key Features Homepage

The website consisted of various sections that aimed to provide a straightforward way of navigation for participants. The homepage sections were as follows:

13.1.1.1 Event Information

The event, co-organized by two EU-funded projects, ReInHerit and DiGiNN, featured a brief introduction, details about the organizers, and information on its location at the CYENS Centre of Excellence in Nicosia, Cyprus.

13.1.1.2 Registration

The website provided the Participants with various registration links, such as:

- User-friendly registration link for participation using Eventbrite.
- A link for easy registration for pre-hackathon events such as webinars. When the participants submit their registration form, they are automatically emailed the Zoom link and information regarding the webinar they registered for.
- Communication links were available for the participants and teams to communicate with each other using Slack.

13.1.1.3 Theme and Challenges

Provided more information regarding the event's theme, challenges, and what is expected from the participants. This was done by presenting them with three categories connecting technology with museums or cultural/heritage sites and asking them to choose one. The aims of the categories were as follows:

- Enhancing the experience of visitors.
- Educating about the contents of the museum/site and the history of its

artifacts.

- Educating about the history of the museum/site itself.
- Educating about the processes surrounding museums/sites.

13.1.1.4 Timeline

The timeline consisted of three different sections:

The first section ‘’Before the Event’’ provided the participants with information on important dates leading up to the weekend of the hackathon, with links to register for the Hackathon on Eventbrite, a link for Slack to facilitate the communication between teams and organizers, and a link to register for pre-hackathon webinars.

The other two sections, “Sunday, January 20” and “Sunday, January 21,” contained information regarding the hackathon schedule and a link to the hackathons page on DEVPOST, the tool participants would use to submit their final projects.

13.1.1.5 Rules

The website contained the guidelines that participants are expected to follow, information regarding the registration criteria, and a link to the code of conduct.

13.1.1.6 Judging criteria and prizes

This section provided clear information on the judging criteria of the presented projects and details regarding the prize value for the winning teams.

13.1.1.7 Mentors and Judges

Information regarding the Mentors and Judges who were available during the Hackathon. Also, media links in which participants can read more about the Mentors and Judges and connect with them.

13.1.1.8 FAQs

The website consisted of answers to various common questions that participants could pose regarding the Hackathon and information on how to keep in touch with the event organizers in case of any other inquiries.

13.1.1.9 Sponsors and Partners

Information regarding the sponsors and links to the sponsor's websites were available.

13.2 Design Considerations

The design considerations were the responsive design, suitable for viewing on various devices, and the simple design that participants could navigate through.

13.3 Testing

The website was tested using different browsers and devices. Feedback regarding the website was collected from various event organizers. A backup version was created

for the website in case of any malfunction.

13.4 Launch and Promotion

The website was launched right after the testing phase to ensure that the information would be clear and that everything would be smooth and easy for the participants to navigate. It was promoted using social media (e.g., Facebook:https://www.facebook.com/photo/fbid=678004184507315&set=a.486987543608981, LinkedIn: https://www.linkedin.com/feed/update/urn:li:activity:7141363177103024129, Twitter: https://x.com/reinherit_/status/1743283159947513969?s=20) and news outlets (e.g., https://cyprus-mail.com/2023/12/29/reinherit-smart-tourism-hackathon-to-take-place-in-january/). The link for the website was reposted on social media a few days before the event.

14 DEVPOST

To manage the submission and evaluation of the projects, an online page was created about the Hackathon using the DEVPOST platform that allowed the hackathon participants to create a short profile of their projects that the judges could access to evaluate within the platform (Figure 6 Screenshot of Smart Tourism Hackathon's DEVPOST site Homepage.):

https://reinherit-hackathon.devpost.com/?ref_feature=challenge&ref_medium=discover

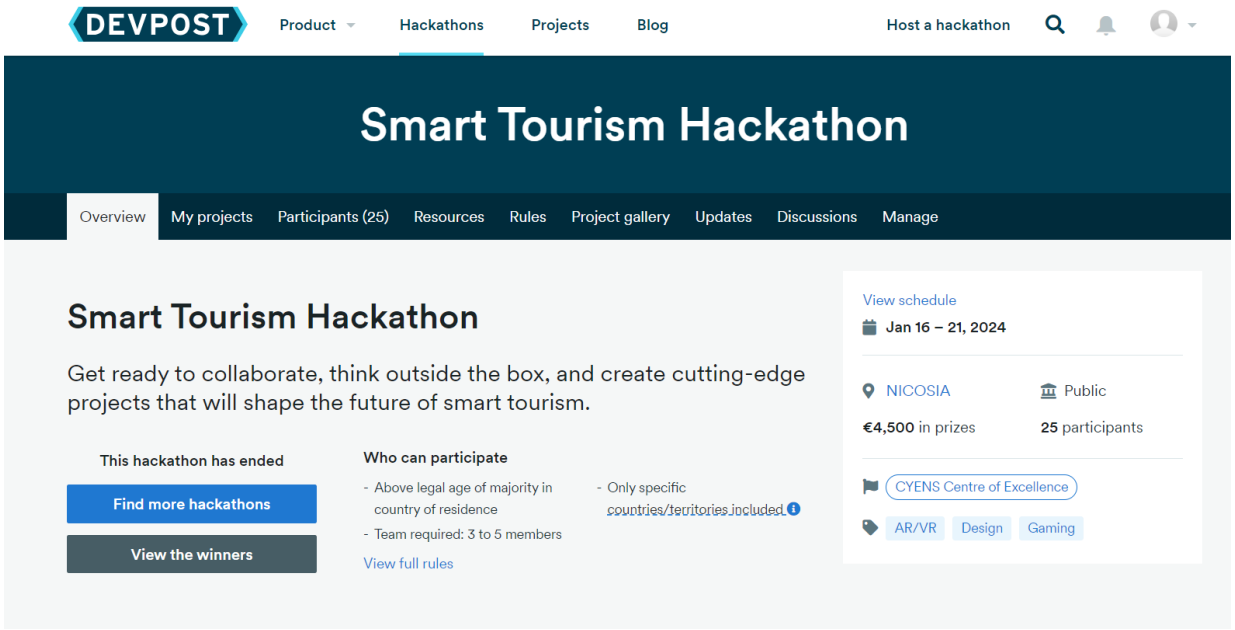
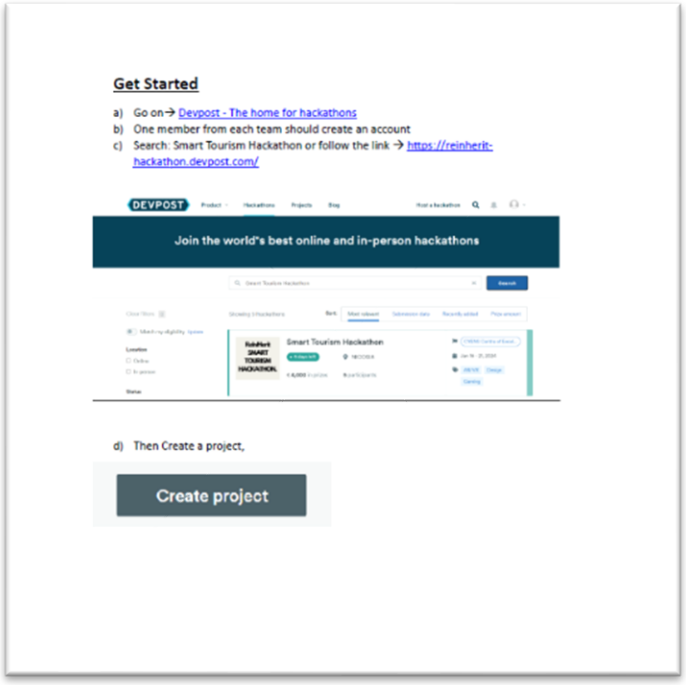


Figure 6 Screenshot of Smart Tourism Hackathon's DEVPOST site Homepage.

Instructions on submitting and evaluating projects were sent to participants and judges via email and Slack (Figure 7 The first two pages of instructions were sent to participants.).



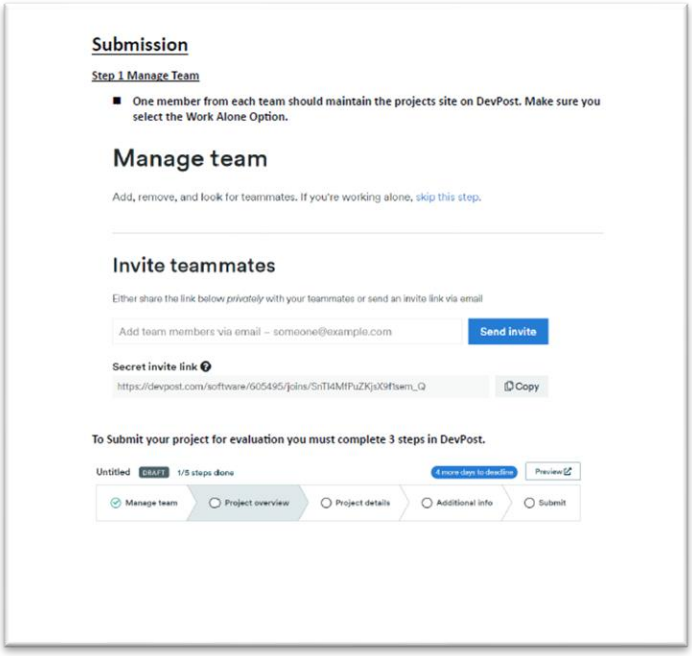


Figure 7 The first two pages of instructions were sent to participants.

At the end of the Hackathon, each team submitted their projects on the platform, and the eligible projects were published on the site's gallery and then disseminated to the judges. In turn, the judges accessed the projects on the platform and submitted their evaluations through the platform. Lastly, in addition to the physical announcement of the winners during the awards ceremony, the winners were informed via email and digitally announced on the DEVPOST site (Figure 8 Smart Tourism Hackathon Project Gallery with Winning Projects.).

Figure 8 Smart Tourism Hackathon Project Gallery with Winning Projects.

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15 Winning Projects/ Ideas

15.1 First Prize Winner: Nicosia Light Festival

The First Prize Winner was the “Nicosia Light Festival” by Jannis Sidiropoulos, which received gifts worth 3,000 euros. The inspiration behind this idea was that, working with light for over 20 years, Jannis wanted to share the joy it brings to people. He is inspired by many lights and visual artists worldwide and the possibilities the open canvas of out-of-the-ordinary canvas of cultural sites gives (Figure 9 Image from the First Prize Winner “Nicosia Light Festival” project.). Janni’s business idea for a light art festival promoting local and international talent while educating about the local culture and entertaining at the same time. To build his concept, he used the Business Model Canvas methodology. The next step for this idea is to approach the authorities and partner with various organizations to start the production process.

Figure 10 Image from the First Prize Winner "Nicosia Light Festival" project.

15.2 Second Prize Winner: The Ultimate Hub for Cyprus Museum

The second prize winner was "The Ultimate Hub for Cyprus Museums", by Maxim Grosul, who received gifts worth 1,250 euros. The inspiration for "The Ultimate Hub for Cyprus Museums" was the popularity of museums in Cyprus. The goal of Maxim with this idea was to help people find data about museums and ask AI Assistants about museums (Figure 10 Screenshot from the second prize winner "The Ultimate Hub for Cyprus Museums".). He built this idea with the help of hackathon mentors to validate concepts and correct the stack. His next step is adding data, onboarding museums, and developing more features (Figure 11 Screenshot from the second prize winner "The Ultimate Hub for Cyprus Museums" showing the chat between the user and AI Assistant.).

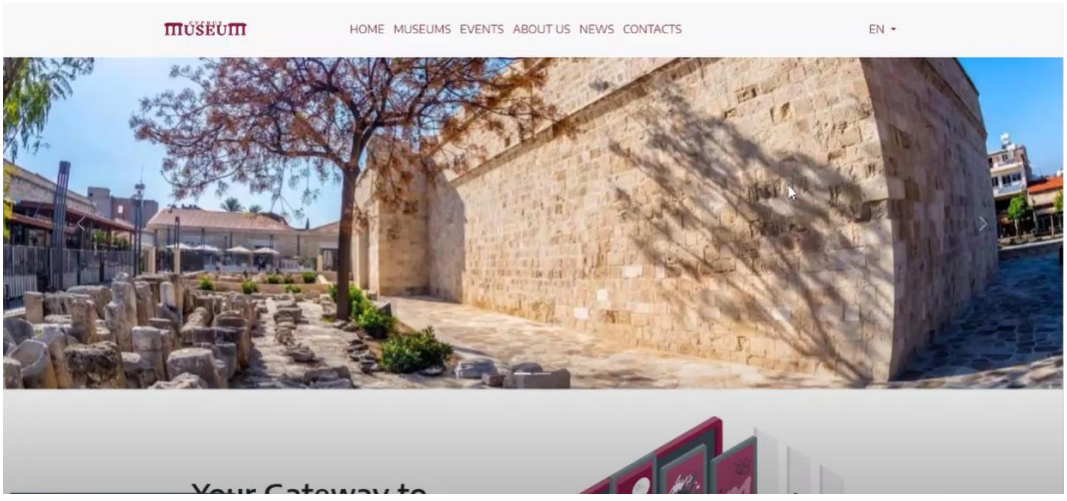

Figure 110 Screenshot from the second prize winner "The Ultimate Hub for Cyprus Museums".

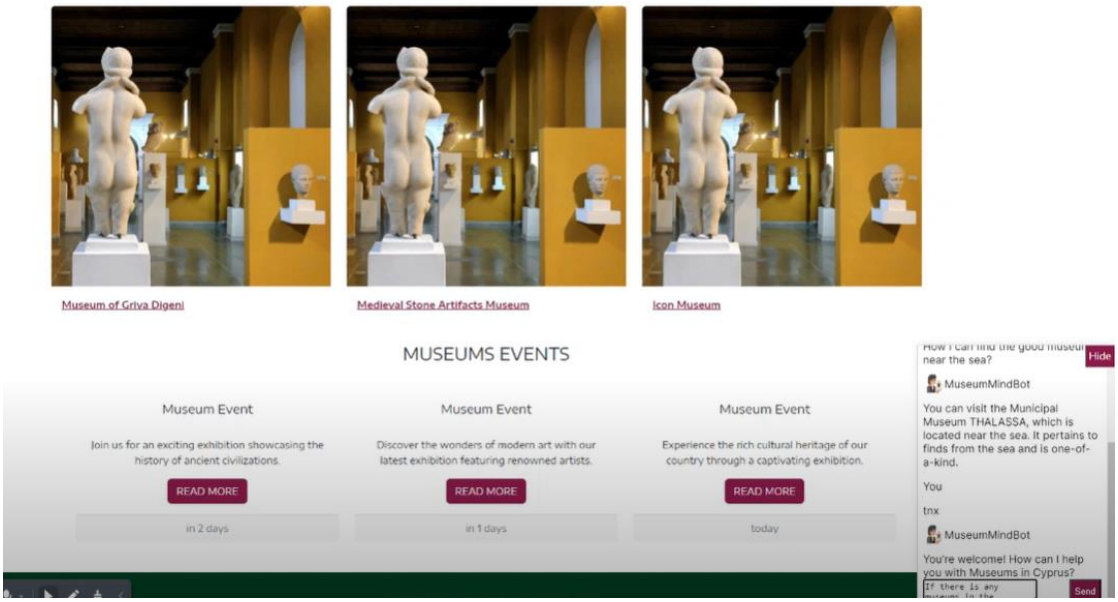

Figure 121 Screenshot from the second prize winner "The Ultimate Hub for Cyprus Museums" showing the chat between the user and AI Assistant.

15.3 Third Prize Winner: Augmented Reality

The third prize winner project was the "Augmented Reality", by Kostas Tsagaridis, who won gifts worth 750 euros. Tour Guide Professionals aims to support professionals like tour guides, hikers, geologists, and botanists by offering services tailored to their needs. These services include access to recording and video studios for podcast creation, assistance building professional webpages, and provision of equipment like headsets and augmented reality glasses through automated dispensers. The company operates as a service provider, partnering with tour guide professionals globally. It respects its exclusive rights to guide tourists through museums, galleries, and archaeological sites. The startup's mission is to enhance productivity and enrich the tourist experience while upholding the integrity of professional roles (Figure 11 Part of the third prize winner project: "Augmented Reality" presentation.).

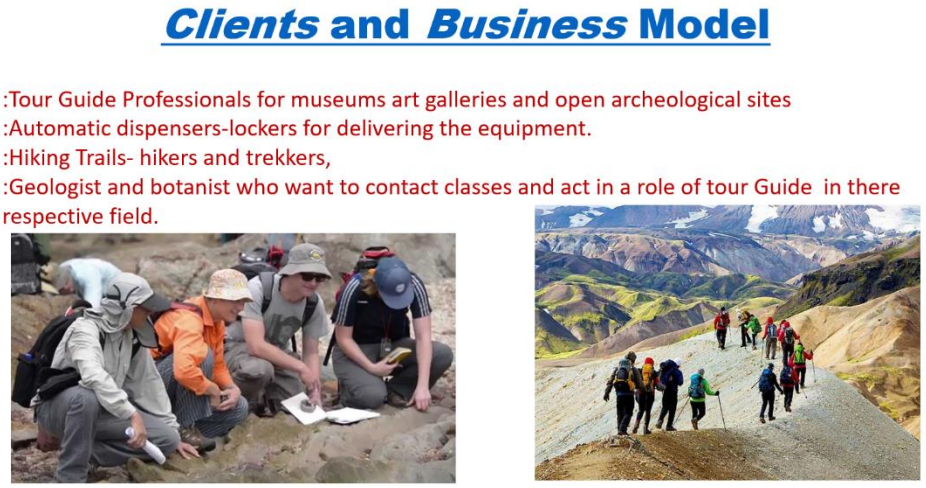

Figure 131 Part of the third prize winner project: "Augmented Reality" presentation.

15.4 Special Award Winner: Archeological Odyssey

The Special Award Winner from the European Cultural Tourism Council was the "Archeological Odyssey", by Georgiou Athanasiadis and Daniil Georgiou, received the special award of 1,000 euros. In the heart of a bustling city, a small but passionate team of game developers embarked on a beautiful journey to bring history to life by creating the "Archaeological Odyssey." As the team delved into development, challenges arose. Balancing historical accuracy with engaging gameplay proved to be a delicate task. The mobile platform created constraints that required creative solutions. However, each challenge was met with perseverance and a commitment to delivering an exceptional gaming experience (Figure 12 Screenshot from the game of the third prize winner project: "Augmented Reality". & Figure 13 Screenshot from the game of the third prize winner project: "Augmented Reality".). The team marveled at the vibrant landscapes, captivating character designs, and historically accurate images. With a playable prototype, the team entered the testing phase (Figure 12 Screenshot from the game of the third prize winner project: "Augmented Reality". & Figure 13 Screenshot from the game of the third prize winner project: "Augmented Reality.").

Figure 142 Screenshot from the game of the third prize winner project: "Augmented Reality".

Figure 153 Screenshot from the game of the third prize winner project: "Augmented Reality".

16 Dissemination

In the pursuit of disseminating the invaluable outcomes and impactful innovations generated during the hackathon, this section provides a comprehensive overview of the dissemination strategies employed. From sharing project insights to engaging with diverse audiences, our commitment to extending the reach and influence of the hackathon's achievements is presented herein. Explore how we strategically communicated the event's successes, fostering knowledge transfer and establishing a lasting footprint in technology, cultural heritage, and sustainable tourism. Embarking on a journey to redefine the future of smart tourism, the Smart Tourism ReInHerit Hackathon beckoned enthusiasts from diverse backgrounds to join us in a groundbreaking exploration. Through our captivating advertising campaign, we painted a vivid picture of a collaborative space where tech specialists, cultural

heritage experts, and innovative minds converged to shape the next wave of museum experiences. The promise of contributing to cutting-edge projects, leveraging technology for sustainable tourism, and optimizing destination management resonated through compelling narratives and visually striking promotions. Emphasizing the unique opportunity to be part of a transformative event, our campaign sparked curiosity and excitement, inviting participants to immerse themselves in a dynamic atmosphere of creativity and discovery. The call to action was clear – come, contribute, and be a driving force behind the evolution of smart tourism. Below is the hackathon's promotional campaign through the following links:

- https://inbusinessnews.reporter.com.cy/article/2023/12/29/750973/smart-tourism-hackathon-sto-kentro-aristeias-cyens/
- https://cyprus-mail.com/2023/12/29/reinherit-smart-tourism-hackathon-to-take-place-in-january/
- https://www.cna.org.cy/en/article/5996132/opening-of-entries-for-cyens-reinherit-smart-tourism-hackathon
- https://www.nicosia.org.cy/el-GR/news/announcements/2024/19114/
- https://www.cbn.com.cy/article/2024/1/3/751463/entries-being-accepted-for-cyens-reinherit-smart-tourism-hackathon/
- https://bnnbreaking.com/breaking-news/education/reinherit-hackathon-igniting-innovation-in-smart-tourism/
- https://www.culturaltourism-network.eu/
- https://stayhappening.com/e/reinherit-smart-tourism-hackathon-E2ISWB09G14
- https://cna.org.cy/tr/article/5996207/cyens-reinherit-ak%C4%B1ll%C4%B1-turizm-hackathonu-i%C3%A7in-ba%C5%9Fvurular-ba%C5%9Flad%C4%B1
- https://m.facebook.com/NicosiaMunicipality/posts/3196575993695544/

This curated selection of photographs serves as a visual testament to the collaborative and innovative atmosphere that characterized the hackathon, providing formal documentation of the key moments and shared creativity throughout the event.

Figure 16 Day 1 of the Smart Tourism ReInHerit Hackathon, at the presentation: Smart Tourism, Smart Destinations, and Cultural Heritage, from Dr. Manos Vougioukas, Secretary General, European Cultural Tourism Network.

Figure 17 Day 1 of the Smart Tourism ReInHerit Hackathon, at the presentation: Empowering the Tourism Industry through Digital Transformation, from Dr. Katerina Loizou, DiGiNN Project Manager, The Cyprus Institute.

Figure 18 Participants on Day 1 of the Smart Tourism ReInHerit Hackathon are working on their ideas and projects.

Figure 19 Mentors and Members of Smart Tourism ReInHerit Hackathon Organization Committee on Day 1 of the event.

Figure 20 Styliani Petroudi, Senior Project Manager, Research Office, at the event's closing ceremony on Day 2.

Figure 22 The audience and the judges during teams' presentations of their ideas/ projects.

Figure 21 Judges awarding the first prize of 2500-euro to the participant Jannis Sidiropoulos.

Figure 23 Judge Mr. Panayiotis Korinos awarded the second prize of 1000 euros to the participant Maxim Grosul.

Figure 24 Mentor Prof. Marco Bertini with the third prize of 500-euro winner Kostas Tsangarides.

Figure 25 Judge Dr. Manos Vougioukas awarded the special award with a monetary amount of 1,000 euros from the European Cultural Tourism Council to participants Georgiou Athanasiadis and Daniil Georgiou.

After the Smart Tourism Hackathon, the remarkable outcomes and groundbreaking solutions were announced through a press release to all the media (Figure 26 The press release for the Smart Tourism ReInHerit Hackathon outcomes in Greek. & Figure 20 The press release for the Smart Tourism ReInHerit Hackathon outcomes translated in English.). This press release encapsulates the essence of the event, showcasing the collaborative efforts and transformative ideas that emerged in the realms of technology, cultural heritage, and sustainable tourism.

ΔΕΛΤΙΟ ΤΥΠΟΥ
23 Ιανουαρίου 2024 - Λευκωσία

ReInHerit SMART TOURISM HACKATHON
στο Κέντρο Αριστείας CYENS

Φωτογραφικό υλικό στον σύνδεσμο WeTransfer: https://we.tl/t-JyDoo1cMEh

Το σαββατοκύριακο 20 & 21 Ιανουαρίου, το Κέντρο Αριστείας CYENS, φιλοξένησε το καινοτόμο **ReInHerit SMART TOURISM HACKATHON**, στις προσωρινές εγκαταστάσεις του, στην οδό Δημάρχου Λέλλου Δημητριάδη, στο κέντρο της εντός των τειχών Λευκωσίας.

Η πρωτοβουλία του ευρωπαϊκού προγράμματος ReInHerit σε συνεργασία με την πλατφόρμα DiGiNN, αποτέλεσε μοναδική ευκαιρία συνάντησης και συνεργασίας ατόμων από τους κλάδους του προγραμματισμού, του σχεδιασμού, των ψηφιακών τεχνολογιών, και της πολιτιστικής κληρονομιάς.

Σκοπός της εκδήλωσης ήταν να ενθαρρύνει την ανάπτυξη ιδεών στους τομείς του έξυπνου τουρισμού 'Smart Tourism', στο πλαίσιο της πολιτιστικής κληρονομιάς, καθώς και να προωθήσει τη διαπολιτισμική κατανόηση, τη συμπερίληψη και την εξερεύνηση νέων ιδεών.

Στο πλαίσιο προετοιμασίας για το διαγωνιστικό μέρος, οι μέντορες του προγράμματος παρέδωσαν εισαγωγικά διαδικτυακά σεμινάρια στους συμμετέχοντες, προσφέροντας καθοδήγηση στην ανάπτυξη ιδεών, εφαρμογών, και στον επιχειρηματικό σχεδιασμό.

Κατά τη διάρκεια του διήμερου Hackathon, το CYENS υποδέχτηκε 6 ομάδες, οι οποίες μετά από διήμερη συνεργασία, ανέπτυξαν καινοτόμες λύσεις σχετικά με τον τρόπο με τον οποίο βιώνουμε τα μουσεία και τους χώρους πολιτιστικής κληρονομιάς.

Μετά τις παρουσιάσεις των ομάδων, η κριτική επιτροπή, ανέδειξε ως νικητήρια ιδέα, το Nicosia Light Festival με επικεφαλής τον Jannis Sidiropoulos, το οποίο παρέλαβε δώρα αξίας 3.000 ευρώ. Την δεύτερη θέση κατέλαβε η ομάδα "The ultimate Hub for Cyprus museums" του Maxim Grosul, ο οποίος παρέλαβε δώρα αξίας 1.250 ευρώ ενώ την τριάδα των νικητών συμπλήρωσε η ομάδα "Augmented Reality", του Κώστα Τσαγκαρίδη, η οποία κέρδισε δώρα αξίας 750 ευρώ. Η ομάδα Archeological Odyssey, των Γεώργιου Αθανασιάδη και Δανιήλ Γεωργίου, παρέλαβε το ειδικό βραβείο με χρηματικό ποσό 1.000 ευρώ, από το European Cultural Tourism Council.

Η ιστοσελίδα του διαγωνισμού https://reinherithackathon.cyens.org.cy/

Πέραν των χρηματικών επάθλων, η εκδήλωση προσέφερε στους συμμετέχοντες μια σημαντική εμπειρία για ενίσχυση δεξιοτήτων, καθώς και ευκαιρίες δικτύωσης και ανάδειξης της δύναμης των διαφορετικών υποβάθρων στην προώθηση της καινοτομίας.

Το ReInHerit είναι ένα πρόγραμμα χρηματοδοτούμενο από το πρόγραμμα Ορίζοντας 2020 της Ευρωπαϊκής Ένωσης, (αριθ. *101004545)* που φιλοδοξεί να διαταράξει το τρέχον status quo επικοινωνίας, συνεργασίας και ανταλλαγής καινοτομίας μεταξύ μουσείων και χώρων πολιτιστικής κληρονομιάς.

Figure 26 The press release for the Smart Tourism ReInHerit Hackathon outcomes in Greek.

PRESS RELEASE
January 23, 2024 - Nicosia

ReInHerit SMART TOURISM HACKATHON
at the CYENS Center of Excellence

Photo material on the WeTransfer link: https://we.tl/t-JyDoo1cMEh

On the weekend of January 20 & 21, the CYENS Center of Excellence hosted the innovative **ReInHerit SMART TOURISM HACKATHON** at its temporary premises on Dimarchos Lellou Dimitriadis Street, in the center of Nicosia within the walls.

The initiative of the European ReInHerit program, in collaboration with the DiGiNN platform, was a unique opportunity to meet and collaborate with people from the fields of programming, design, digital technologies, and cultural heritage.

The event's purpose was to encourage the development of ideas in the fields of 'Smart Tourism' in the context of cultural heritage and promote intercultural understanding, inclusion, and the exploration of new ideas.

In preparation for the competition portion, program mentors delivered introductory webinars to participants, offering guidance in idea development, applications, and business planning.

During the two-day Hackathon, CYENS welcomed 6 teams, who, after two days of collaboration, developed innovative solutions on how we experience museums and heritage sites.

After the groups' presentations, the jury highlighted the winning idea the Nicosia Light Festival led by Jannis Sidiropoulos, which received gifts worth 3,000 euros. The second place was taken by the team "The Ultimate Hub for Cyprus Museums" by Maxim Grosul, who received gifts worth 1,250 euros. At the same time, the trio of winners was completed by the team "Augmented Reality" by Kostas Tsagaridis, who won gifts worth 750 euros. The Archeological Odyssey group of Georgios Athanasiadis and Daniil Georgiou received a special 1,000-euro award from the European Cultural Tourism Council.

The website of the competition is https://reinherithackathon.cyens.org.cy/

In addition to cash prizes, the event provided participants with important skills-building experience and networking opportunities and highlighted the power of diverse backgrounds in driving innovation.

ReInHerit is a program funded by the European Union's Horizon 2020 program (no. 101004545) that aspires to disrupt the current status quo of communication, collaboration, and innovation exchange between museums and heritage sites.

Figure 27 The press release for the Smart Tourism ReInHerit Hackathon outcomes translated in English.

17 Evaluation

Following the conclusion of the Hackathon, a satisfaction survey was conducted to allow participants to evaluate various key aspects of the event. The survey targeted critical areas such as content, skills acquisition, activities during the Hackathon, including mentoring and collaboration, and the overall organization of the Hackathon. Participants were encouraged to provide feedback on their satisfaction levels, utilizing a scale ranging from 1 (indicating very dissatisfied) to 7 (indicating very satisfied).

Satisfaction with the content encompasses the quality (*M* = 7.00) and usefulness (*M* = 6.50) of the materials presented during the Hackathon. Participants evaluated both the quality of the content and its practical usefulness. Notably, all participants expressed satisfaction, with most indicating complete satisfaction regarding the content provided during the Hackathon.

Satisfaction with the new skills acquired includes skills acquisition, encouragement (*M* = 6.00), and support for innovative and creative ideas (*M* = 6.75) during the Hackathon. All participants expressed their satisfaction with the newly acquired knowledge and skills, indicating high satisfaction with the encouragement and support for innovative and creative ideas provided during the Hackathon.

Hackathon activities, including mentoring and collaboration, were assessed on various dimensions, including the overall flow and organization of activities throughout the event, encompassing transitions between different phases and events (*M* = 6.75). Participants provided feedback on the quality of mentors, considering factors such as content knowledge and the effectiveness of explanations (*M* = 6.75). The evaluation also explored the collaborative dynamics within participant teams during the Hackathon (*M* = 7.00). Almost all participants conveyed complete satisfaction with all the aspects above.

The Hackathon facilities encompass the venue and the overall facilities (e.g., seating arrangements, audio-visual equipment, lighting; *M* = 7.00). Participants expressed high satisfaction levels, particularly concerning the Hackathon facilities. Moreover, they expressed satisfaction with the Hackathon venue (*M* = 6.00).

The organization of the Hackathon encompasses both the Hackathon schedule and the information disseminated by the organizers. Participants were satisfied with the information provided by the organizers (*M* = 6.00) and were very satisfied with the Hackathon schedule (*M* = 6.75).

Lastly, participants were requested to share their overall satisfaction with the Hackathon. All participants were very satisfied with the Hackathon *M* = 7.00).

There were three open optional questions. For “How could the Hackathon be improved?” one participant referred to the chairs used for working during the Hackathon. At the “What other events would you be interested in attending in the future?” question, one participant referred to webinars and meetups. In the additional comments, one participant commented that it was very good.

Also, the Hackathon had 24 participants, and at each webinar, they attended approximately 15 people.