iHERITAGE JORDAN

EXPLORING THE FUTURE OF CULTURAL HERITAGE PRESERVATION: IHERITAGE AR AND VR LIVING LAB PUBLICATION 2023

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VR/AR proposed projects for Petra

The Jordanian Society for Research, Entrepreneurship and Creativity

ENI CBCMED Cooperating across borders in the Mediterranean

Project funded by the EUROPEAN UNION

REGIONE AUTÒNOMA DE SARDIGNA
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“The European Union is made up of 27 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders”

Total budget for the project is 3874287.06 euros of which EU's contribution is 3486858.35 at 90 % and partners contribution is 387428.71 at 10%

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A Rose - Red City Half As Old As Time (By John William Burgon 1845)

It seems no work of Man's creative hand,

by labour wrought as wavering fancy planned,

But from the rock as if by magic grown,

eternal, silent, beautiful, alone!

Not virgin-white like that old Doric shrine,

where erst Athena held her rites divine;

Not saintly-grey, like many a minster fane,

that crowns the hill and consecrates the plain;

But rose-red as if the blush of dawn

, that first beheld them were not yet withdrawn;

The hues of youth upon a brow of woe,

which Man deemed old two thousand years ago,

match me such marvel save in Eastern clime,

a rose-red city half as old as time.

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IHERITAGE AR / VR LIVING LAB PUBLICATION

ABSTRACT

The Living Labs administrators conducted research to expand knowledge and explore the use of new technologies, including virtual reality (VR) and augmented reality (AR), in promoting cultural heritage in the area. This initiative is part of the Heritage project, which involves the collaboration of six Mediterranean countries, namely Italy, Spain, Portugal, Jordan, Lebanon, and Egypt.

The project aims to promote:

- Cross-border technology transfer
- Living labs
- Industry-academia collaboration
- The creation of spin-offs and new products using ICT technologies such as AR, VR, and MR.

BACKGROUND, OBJECTIVE & HYPOTHESIS

Petra is an ancient city located in Jordan that is a UNESCO World Heritage site and a popular tourist destination. The site is known for its beautiful architecture, including buildings, temples, and tombs carved into the pink sandstone cliffs. Some of the most famous structures at Petra include the Treasury, the Monastery, and the Roman Theater. In addition to its historic and cultural significance, Petra also offers modern amenities for tourists thanks to the number of restaurants, cafes and gift shops in the area.

In recent years, there has been a growing interest in using virtual reality (VR) and augmented reality (AR) technologies to promote tourism in Jordan, including Petra.

Therefore, this paper will explore the ways in which VR and AR can be integrated into the promotion of Petra, and how intangible cultural heritage can be used to promote tourism in Jordan more broadly.

AR AND VR: EXPLAINED

Virtual reality (VR) and augmented reality (AR) are two exciting technologies that have revolutionized how people interact with computers and data. While AR is located closer to the real world, VR solutions represent a virtual world. AR combines the interactive real world with an interactive computer-generated world, making them appear as one environment. This means that users can move around real objects while virtual ones react as if they are integrated with the real world.

VR is a modern technology that allows users to transfer to a virtual world where they can represent various elements, including culture. It enables humans to visualize, manipulate and interact with complex data and consists of two critical issues: the world (usually 3D) and an appropriate level of interaction with realism.

AR technology is an emerging scientific technology based on VR technology. Its goal is to nest virtual information expressed by computers in the real world and interact on the terminal device. AR technology includes multimedia, three-dimensional modeling, real-time video display and control, multi-sensor fusion, real-time tracking, registration, scene fusion, and other functions. AR provides an unprecedented user experience by creating a correspondence between the real world space and the virtual space that visually models the content. AR technology has been widely used in people's daily lives and has become the most critical technology in people's lives.

In recent years, there has been an upsurge of AR applications globally, and cultural heritage display is a key area of AR applications. AR applications can provide convenience for people's daily life in learning and work, and change people's lives by creating real scenes of different content and displaying virtual information that closely integrates virtual and reality. AR technology's continuous development has allowed it to become a critical tool in people's lives, enhancing their understanding and perception of reality and providing a sensory experience and information synthesis beyond reality.

With the advancement of AR and VR technologies, it is expected that they will increasingly be utilized in addressing ICH issues. Through their implementation in various applications, knowledge dissemination about cultural heritage will be facilitated, thereby enabling the preservation of tangible and intangible cultural elements for present and future generations to access.

ICH stands for Intangible Cultural Heritage. It refers to the cultural expressions and practices that are unique to a particular community or group, including traditional music, dance, rituals, festivals, storytelling, crafts, and knowledge systems.

Unlike tangible cultural heritage such as buildings, monuments, and artifacts, which can be physically touched and preserved, intangible cultural heritage is transmitted from generation to generation through oral tradition, performance, and practice. It is deeply ingrained in the identities, values, and beliefs of communities and plays a crucial role in maintaining social cohesion and promoting cultural diversity.

The importance of safeguarding intangible cultural heritage lies in its potential to promote intercultural dialogue, respect for cultural diversity, and sustainable development. By preserving and promoting ICH, communities can strengthen their cultural identity, enhance their social and economic well-being, and promote peace and understanding between different cultures. Virtual Reality (VR) and Augmented Reality (AR) technologies have the potential to preserve and promote Intangible Cultural Heritage (ICH) in various ways, which we will get into during this research.

RESEARCH OBJECTIVE

The primary aim of this research is to leverage cutting-edge technological developments and innovations to support education and further research. In addition, the research seeks to promote and raise awareness of Jordanian cultural sites, with the ultimate goal of enhancing and elevating economic and social development in the region.

DIAGNOSIS OF PROJECT BACKGROUND, CHALLENGES & NEEDS

- Scarce development of innovative products plus services in the field of tourism and cultural heritage.
- Non-adequate measures to digitally valorize Mediterranean Intangible Cultural Heritage (ICH).
- Lack of Mediterranean AR/VR/MR platform dedicated to tangible and intangible cultural heritages (TCH and ICH)
- Wide gap between the level of information, services and ICT data access offered.
- Profound digital divide to access innovation culture between northern and southern med shore.
- Shortage in skilled workforce.
- Non-existent systematic collaboration.
- Absence of common promotional platforms for creative industries.
- Target groups and final beneficiaries:
- 300 researchers and ICT specialized staff.
- 300 public entities staff.
- At least 3000 SME’s and innovative start-ups.
- 6000 NEETS.
- 10.000.000 tourists.
- 2.000.000 general users.
- 25.000.000 local population

HYPOTHESIS

The iHERITAGE project hypothesis tackles critical socio-economic challenges that extend beyond borders, including unemployment, economic trends, and business development and innovation. The project aims to leverage innovative technology and education to promote and conserve Jordanian cultural heritage sites, thereby contributing to economic growth and job creation in the region. Additionally, the project strives to foster a culture of innovation and entrepreneurship, promoting positive socio-economic outcomes not just for Jordan but for the broader cross-border community as well. The iHERITAGE project is a forward-looking initiative that aims to address the most pressing socio-economic issues while preserving Jordan's rich cultural heritage.

DIAGNOSIS OF PROJECT BACKGROUND, CHALLENGES & NEEDS

The iHERITAGE project could face a number of challenges in its implementation. These challenges could include issues related to funding and resource allocation, as well as technical challenges associated with the development of the digital platform and other project activities. To better understand and assess the challenges that could be associated with the project read the below.

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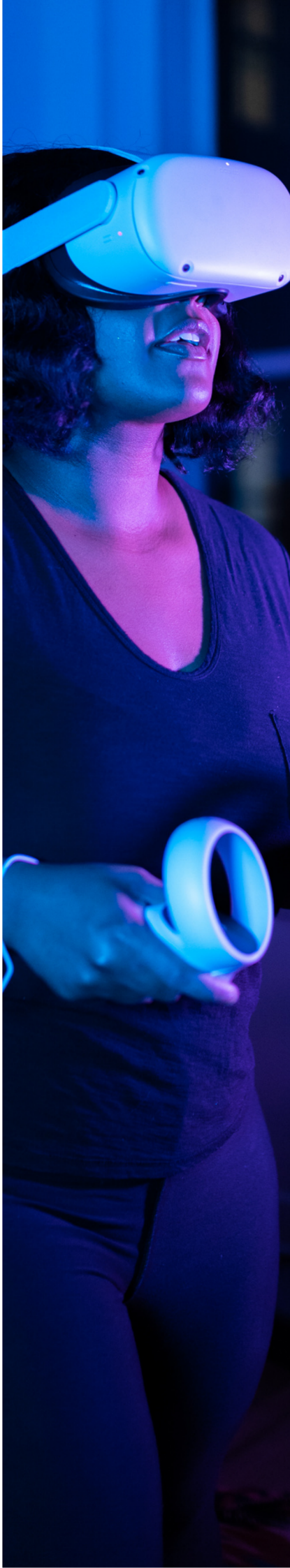


METHODOLOGY

The iHERITAGE project will:

1. Foster active involvement of young people, females, and NEETs.
2. Support collaboration among universities as well as Small and Medium Enterprises (SMEs).
3. Create and enhance caliber through offered training services.

The importance of filling out the survey forms will:

1. Act as an indicator that measures the level of importance of this research.
2. Determine valuable lectures held during the workshops.
3. Decide on future training courses which should be held in February based on the feedback gained from the forms.

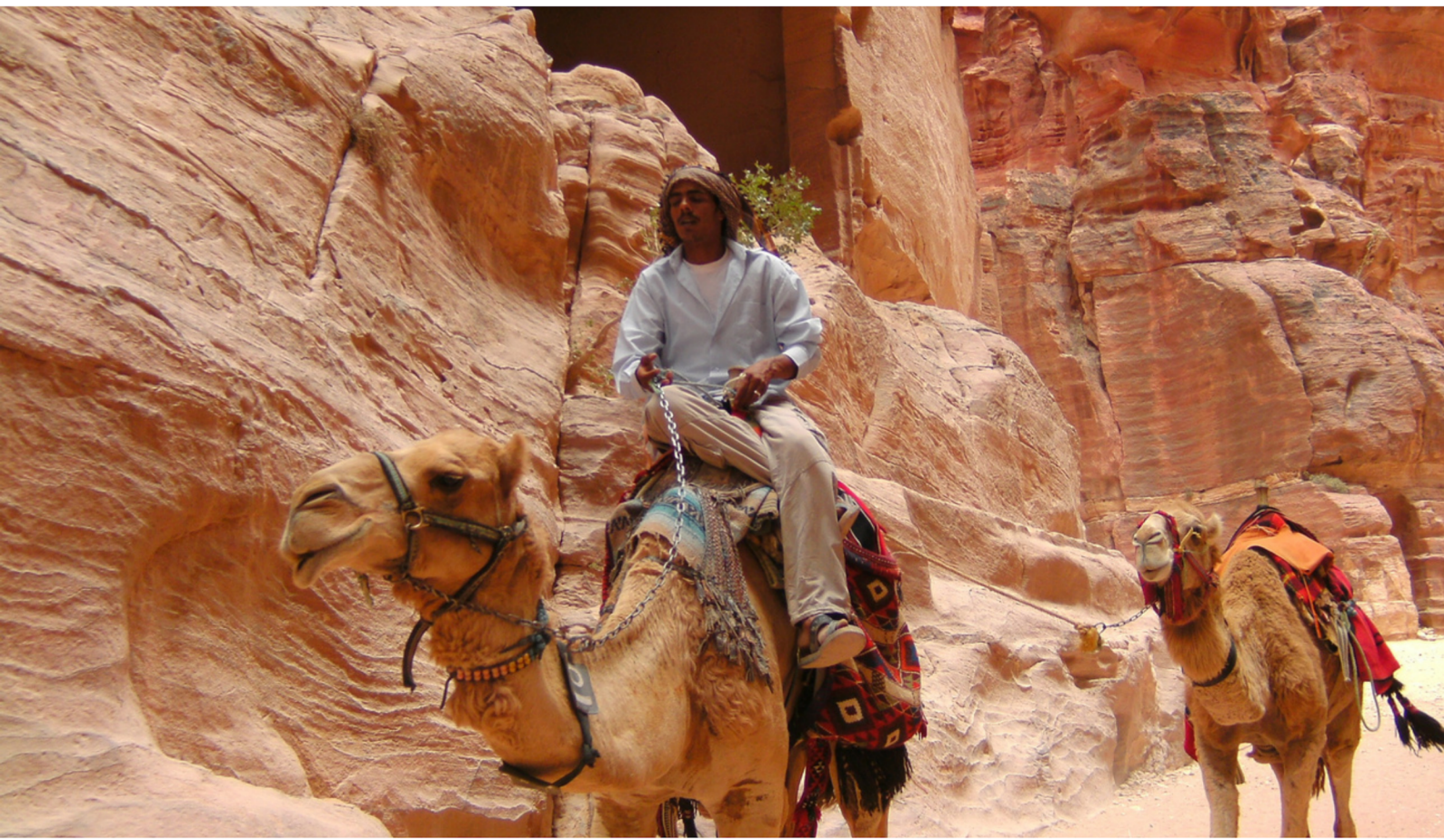
6 WORK PACKAGES

There are 6 work packages that will be undertaken in the various stages of this project:

1) Preparation: Done!
2) Management: Done!
3) Communication: on going until the 5th semester to keep updating this information.
4) Living Labs: taking place now.
5) Establishment: later.
6) Capitalization and commercialization: later.

EXPECTED OUTPUT OF COMMUNICATION PHASE

- Information and Communication plan (ICP).
- Press releases and newsletters.
- Augmented Brochures: “augmented” experience starting from existing paper brochures on smartphones which will be in 3D.
- AR social media marketing: regularly posting on FB, Instagram, Twitter, and YouTube.
- 360-degree video trailers: 360 degrees with 8K resolution is currently being developed for Petra.
- Native app: for products and data that can be used on/off-site.
- Co-publications: between students, researchers, experts, and companies to produce Tangible and Intangible research about the use of ICT technologies.
- Immersive banners and landing pages: a landing page for iHERITAGE Jordan already exists; immersive banners will take you to an augmented and virtual reality experience to explore Petra in a different way.



- AR/VR content for web platforms: will be available for many devices; therefore, they won't be for wearable or screen content only, but will be published on an open platform to make it accessible from other devices and platforms.
- Translation of communication and promotional materials: information will be translated and will be made available in multiple languages and not only in Arabic for better communication.
- EXPO DUBAI 2020.

Expected Output of Living Labs Phase:

- A research agreement will be held between universities, researchers, and SMEs to develop prototypes as well as test products and services for this project.
- The difference between virtual reality, augmented reality, and mixed reality will be identified, highlighted, and tested.

EXPECTED TOOLS AND PLATFORMS TO BE USED DURING THE ESTABLISHMENT PHASE

The tools that are going to be used in iHERITAGE projects are needed to generate innovative products, which will need financing and this, in turn, will open new spin-offs and jobs, which will enhance the visiting experience for these places; and the tools are:

Virtual Reality (VR): when you are surrounded by virtual reality. The real world is replaced by the virtual world and you are completely immersed in the digital content around you.

Augmented Reality (AR): uses reality (the real world) as a backdrop or a stage for virtual content. Therefore, you can see everything, yet the virtual content is placed in the real world (models or any virtual object such as a pictures, information, on videos). These objects can be activated or triggered.

Mixed Reality (MR): of which AR is part of, and have an understanding of the reality you are in. It has a special mapping where physical and virtual realities interact with one another; in addition to people interacting with these two realities.

A. Training: designed to inform researchers and equip them with competencies of commercial and marketing exploitation of research agreement results. There will be special training sessions for AR, production in cultural heritage, and training sessions in holography.

B. Creation of innovative products/ services: all offered trainings will result in ideas, apps, products, and services, add to them ideas from the research agreement, will help establish new start-ups (companies). People will be able to submit their ideas and products to be studied, tested, and supported to eventually be funded; and finally, they can be commercialized and launched. This process will give researchers a chance to meet young creative people who are being trained in these sessions to launch their ideas benefiting both sides.

PROJECT ACTIVITIES

To achieve its objectives, the iHERITAGE project will employ a range of activities that leverage the latest technological advancements and educational strategies. These activities will include the development of a digital platform for the promotion and preservation of Jordanian cultural heritage sites, the creation of interactive and educational content for visitors, and the establishment of training programs for local communities to facilitate their involvement in the project.

The project activities will be implemented as followed:

- VR rooms and VR booths will be available at museums and heritage places.
- AR/VR intangible heritage, Mediterranean Cuisine: related to food and dishes served in the country.
- AR/VR guided tours: for example, a tourist using his mobile device and listening to information about the site is an interactive testing that will enhance the visitor's experience of these places.
- 3D Re-context: experts will rebuild the already existing item in a heritage place, and through the AR/VR, visitors will be able to see the item's whole context (how it looks like and where it came from.
- Archeological cinema: a lot of movies were filmed in Petra; therefore, visitors can see these scenes on the spot.
- VR Cardboard excursion: are low cost, efficient, and simple tokens that can be given to users after being used. Using smartphones and apps, visitors can use their devices and glasses to see and explore places.
- Past Orienteering: archeological video game engine that uses video game technology to enhance a visitor's experience.
- Space-time elevator: a virtual elevator that ascends through space and time. As the visitor ascends, he sees the place from above in a wider context, and also as the elevator ascends, the visitor sees the place as it was in the past.
- AR wearables (smart glasses): will be available to experience the heritage sites in a different way, the information will be overlaid in real-time on these sites.
- Holographic exhibitions: will involve projections of the holography technology. Content is displayed in a booth, and can be seen through a light that projects through holography technology.
- Virtual Archaeological Reconstruction: a technology used to reconstruct a place as it was in the past, and allow visitors to see how the place used to be. It involves laser scanning for accuracy of scenes of life (virtual people walking around you).

C. Prototyping and testing: participants' ideas will be supported, guided, prototyped, and tested by trainers and specialists. Finally, these ideas will be commercialized leading to new job opportunities which is the main output of the establishing phase.

Outputs of Capitalization & Commercialization

- Commercialization of new products and services will spread the use of new innovative ideas gained from participants and researchers to reach as many users as possible. This will in turn create more job opportunities and enhance skills as well as digital literacy.
- Capitalization will result in the collaboration of multiple disciplinary entities in the cultural heritage field such as:

A) ICT cluster of Mediterranean UNESCO cultural heritage: iHERITAGE CLUSTER.
B) Institution of CRESPIEM.
C) Action Plan of UNESCO Mediterranean cultural heritage.
D) iART: festival of digital arts for Mediterranean UNESCO cultural heritage.

RESULTS

- Create a VR tour of Petra: A VR tour of Petra could allow visitors to explore the site in a more immersive and interactive way, allowing them to experience the site.

- 3D modeling: building a cultural heritage platform to serve tourists in general and local residents. The aim is to conduct a research on cultural sites and rebuild these places using 3D technologies. After that, these models will be presented using VR/AR.

- Develop a game like Minecraft where people will be able to build heritage sites, like Petra.

- To create a games that teach how mosaics are made, about sugar cane making, how olive press works, or how wine is made.

- Existing ideas: instead of explaining to tourists how a water mill works, a game was developed to explain it to them, and by playing the game the tourists get to know how mills work. Also applies to save the castle, by making weapons and defeating enemies.

- A game of making a Lebanese dish by having the right order of its elements. The player would try to guess the right order of the recipe, the players get two attempts and in the third attempt, they are given the right answer. This can also be done by making traditional Jordanian dishes, embroidery, and pottery.

- Another idea related to teaching embroidery: Lessons for people on how to make clothes or scarfs using AR/VR. Teaching people embroidery allows for gaining income and is a step to protect the intangible aspect of embroidery.

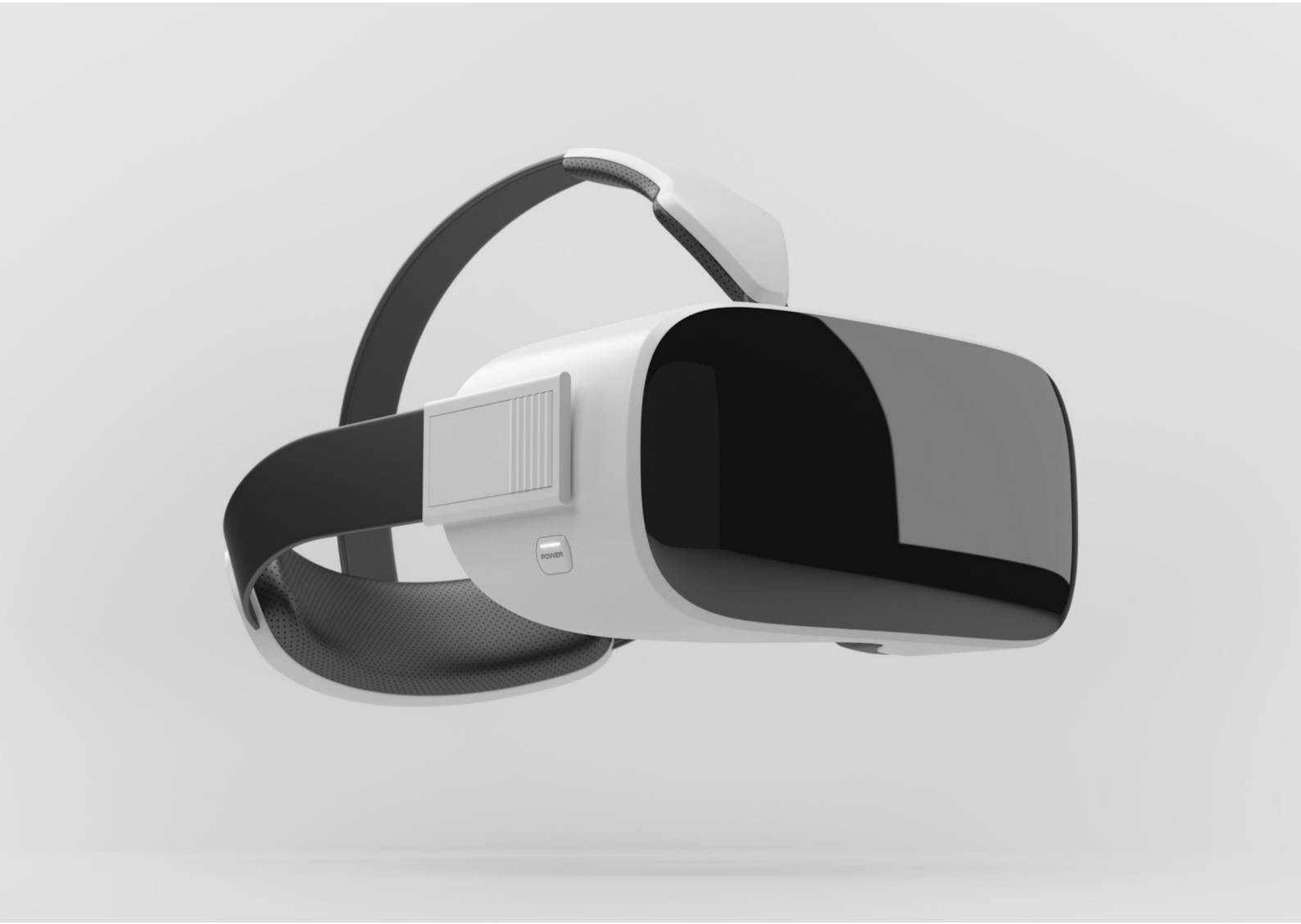
- An AR\VR application that shows the process by which Petra was carved into stones or the treasury was built. Developing a game that shows the architectural elements of Petra. Make a VR application to show the souvenirs. Also, to use AR to overlie their details and information. 3D printed souvenirs made of ceramic or a stronger material (like plastic). Make a game of sand art (sand inside of a glass bottle).

- To develop a game of the journey from Alseeq to the Girl's castle (Qasir Albinit) or the tomb along with all the obstacles that people encounter on this path.

- Virtual reality applications that are related to "Al-kiblah". This idea links the intangible with the tangible (Kaaba).

- 3D model of heritage sites and items to be presented and shown to tourists in a Virtual Museum. This can be used on mobile devices or PC. Drones will be used to take better 3D modeling pictures of Petra.

- A virtual reconstruction of heritage sites. A 360-degree picture that tourists can explore; tourists can zoom in/out, explore the whole area from different angles, and there will be arrows on the pictures that are linked to the places to show 3D pictures, for example, to what is inside these places. Each monument will have its own virtual reality museum.



RECOMMENDATIONS

To ensure the success of the iHERITAGE project, several key recommendations should be considered and implemented.

- Provide a range of VR and AR experiences: In order to appeal to a wide range of visitors, it is important to provide a range of VR and AR experiences that cater to different interests and preferences. This could include VR tours of Petra, AR experiences that provide additional context and information about the site, and interactive kiosks that allow visitors to explore Petra in a more interactive way. Visitors can immerse themselves in a 3D simulation of Petra, with guided tours of popular sites like the Treasury, Monastery, and Royal Tombs.

- Collaborate with local cultural organizations: In order to ensure that VR and AR experiences accurately reflect the cultural significance of Petra, it is important to work with local cultural organizations to ensure that the experiences are authentic and culturally sensitive.

- Promote the use of VR and AR: In order to encourage visitors to take advantage of VR and AR experiences, it is important to promote their availability and encourage visitors to try them out. This could include providing information about VR and AR experiences in marketing materials, offering discounts or promotions for those who use them, and promoting their use through social media and other channels.

- Foster a sense of community: In order to create a sense of community among visitors to Petra, it is important to encourage the use of VR and AR experiences that allow visitors to interact with each other and share their experiences. This could include social media platforms or other interactive experiences that allow visitors to connect with each other and share their experiences at Petra.

- Petra National Trust (PNT): an NGO that works on cultural heritage development. It has different programs orbits around cultural heritage education, raising awareness, and valuing tangible and intangible cultural heritage. They are looking for more ideas about the advanced digitizing of their programs and already started working on digitizing their current content programs via a platform that is being developed. Some of the ideas that they have developed so far are: Interface screens as well as online exercises for children, kids, and youth.

TOOLS

In order to implement the suggested recommendations, and to ensure the project's success, there is specific tools that will make the recommendations come to life. These tools include the following:

- **VR headsets:** VR headsets allow users to experience Petra in a virtual environment, allowing them to explore the site in a more immersive and interactive way.

- **AR apps:** AR apps can be used to overlay information and interactive elements onto the real-world environment, allowing visitors to learn more about the history and cultural significance of Petra while they explore the site.

- **360-degree cameras:** 360-degree cameras can be used to capture immersive video of Petra, which can then be viewed on VR headsets or other devices.

- **Interactive kiosks:** Interactive kiosks can be placed throughout Petra, allowing visitors to access information about the site and its history in a variety of languages.

- **360-degree cameras:** 360-degree cameras can be used to capture immersive video of Petra, which can then be viewed on VR headsets or other devices.

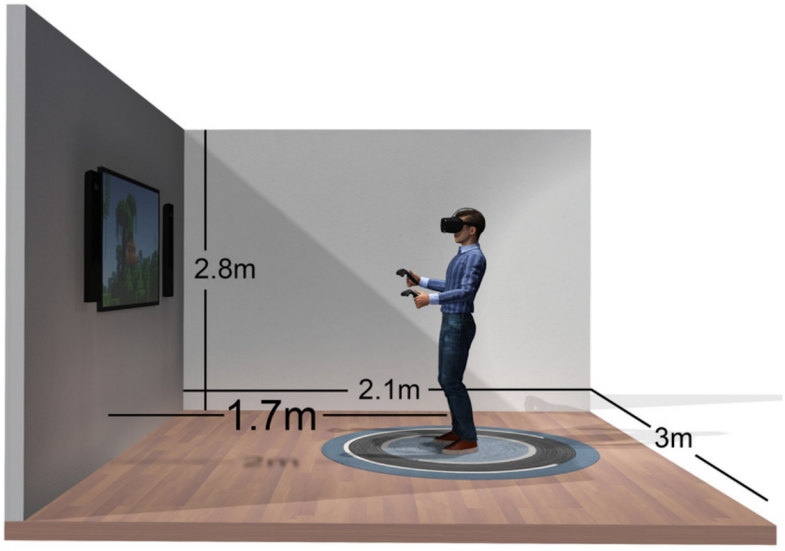
- **Augmented reality guides:** Augmented reality guides can be provided to visitors, allowing them to access information about Petra and its history in a more interactive and engaging way.

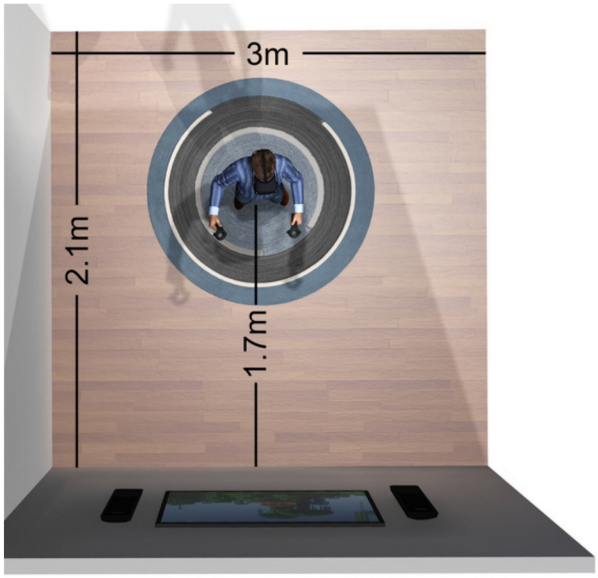
- **Creation of games that uses VR/AR/MR which still need the following components:** Overall architect (game designer), content (historian), programming (computer scientist) artwork (graphics designer), actors (voice narrators), and engineering (developer).

HOW TO BUILD A VR ROOM OR BOOTH

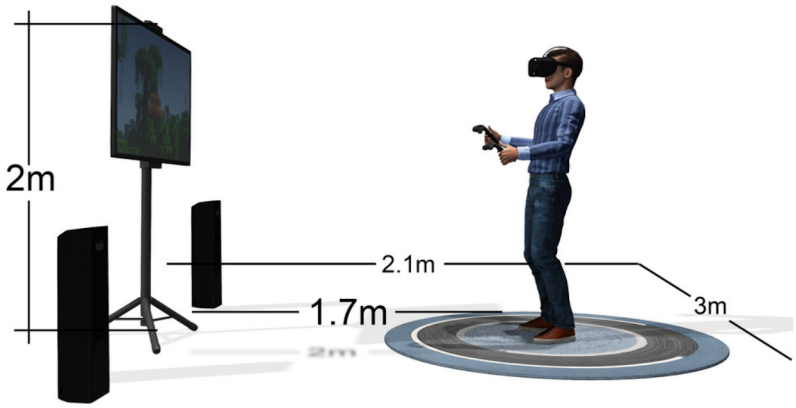
Not only are the tools important, but also learning how to design and create a VR Room or Booth is essential, as you need to get the measurements and space right. Here is how you can do that:

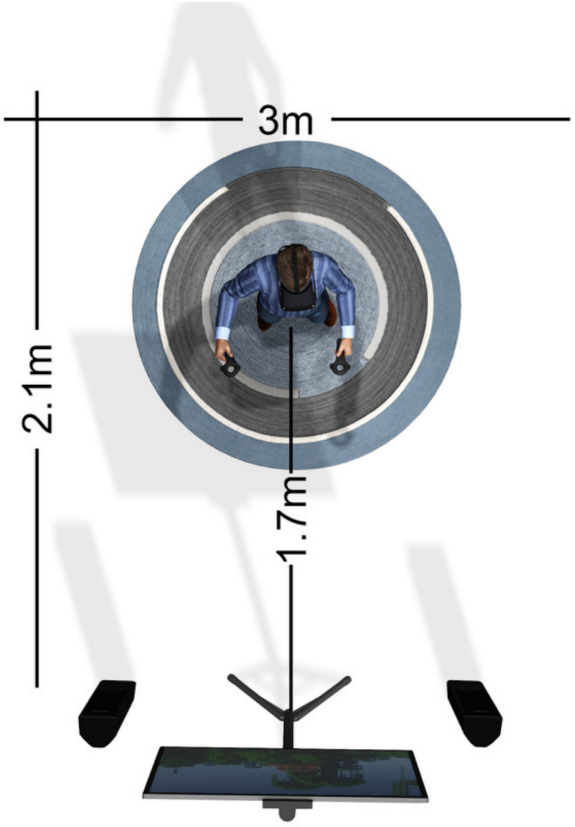
MEASUREMENTS OF A VR ROOM



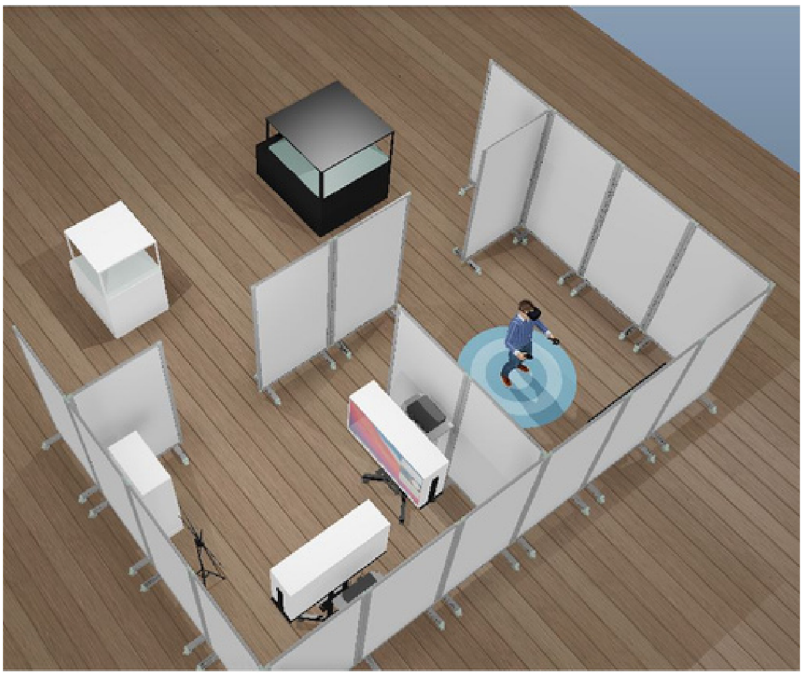


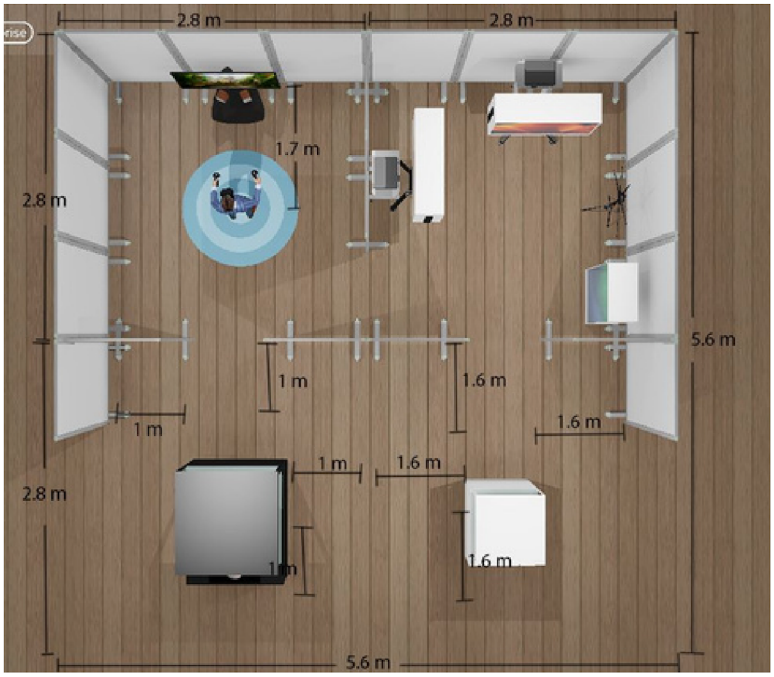
MEASUREMENTS OF A VR BOOTH

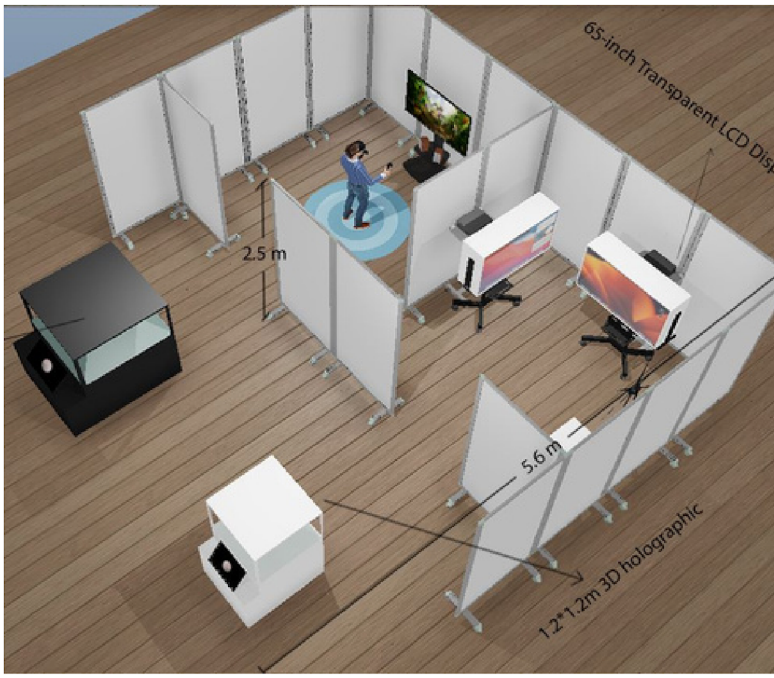


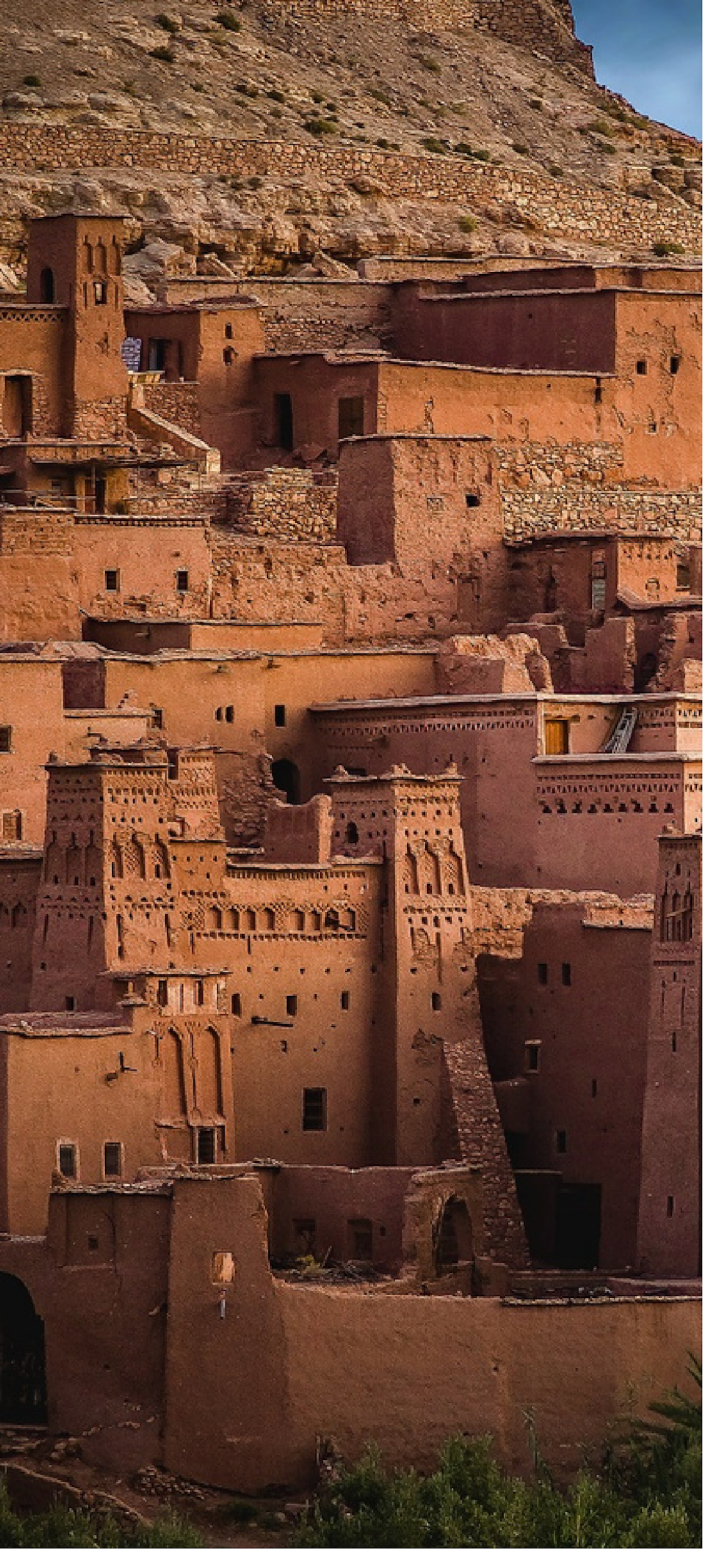


MEASUREMENTS OF A VR BOOTH









QUALITATIVE RESEARCH REGARDING ICH

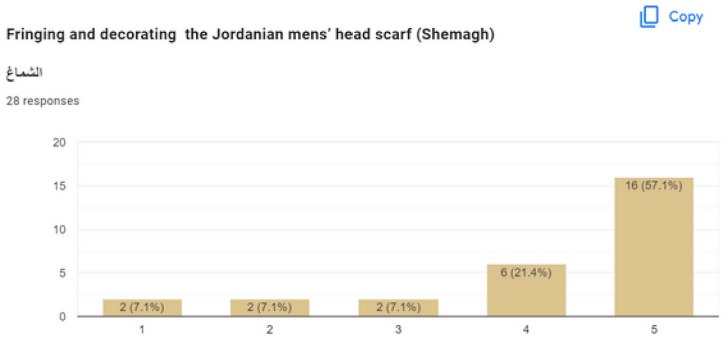
In order to better understand the needs of the community and learn how VR and AR technology could be implemented to promote the Jordanian heritage a survey was conducted to identify the Jordanian Intangible Cultural Heritage (ICH). ICH refers to the traditions, practices, expressions, knowledge, and skills that communities, groups, and individuals inherit and pass on from generation to generation. It includes customs, beliefs, rituals,

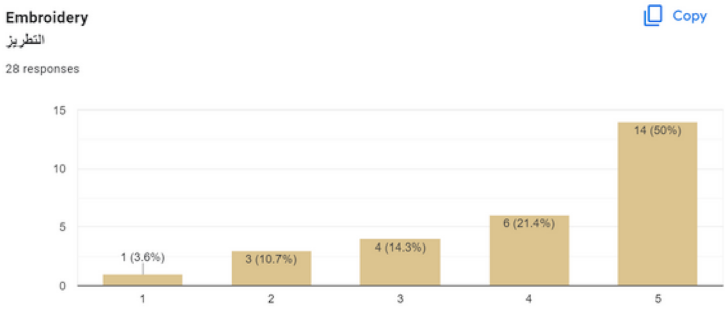
music, dance, oral traditions, languages, and other forms of cultural expression that are not physical or tangible.

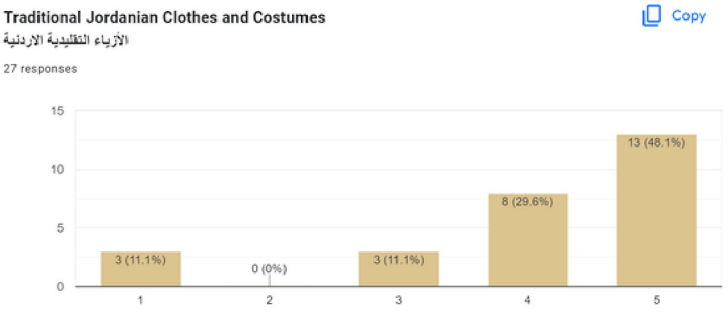
ICH is a vital part of a community's identity and cultural diversity, not only does it contribute to social cohesion and sustainable development, but it can also act as a source of income. Therefore, VR and AR technology can be used to promote the Jordanian ICH elements.

SURVEY RESULTS

The following charts are a glimpse of the data that was collected through a survey that was conducted using random sampling within Jordan with aim of studying which ICH elements do Jordanian most relate to and wish to experience through VR and AR technology.







Al-Mansaf in Jordan a festive banquet and its social and cultural meaning
المنسف في الاردن: وليمة احتفالية ووظائفة الاجتماعية والثقافية

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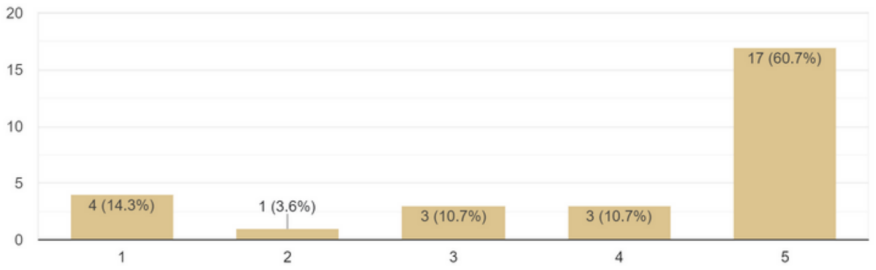
28 responses



Coffee Traditions
عادات القهوة

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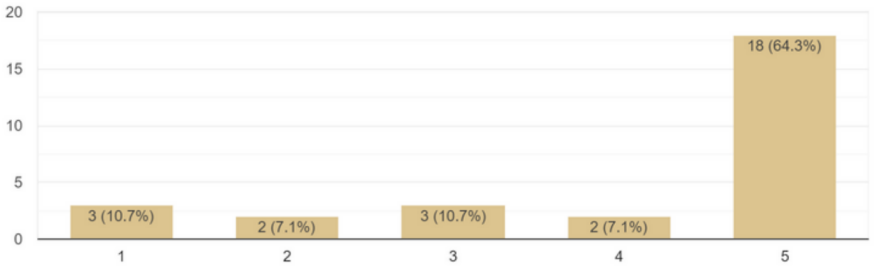

Arabic Calligraphy Arts
فنون الخط العربي

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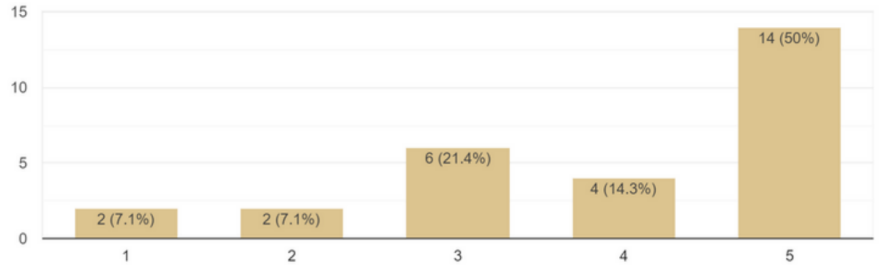

Skills and Practices related to the Craft of Mosaic
المهارات والممارسات المرتبطة بحرفة الفسيفساء

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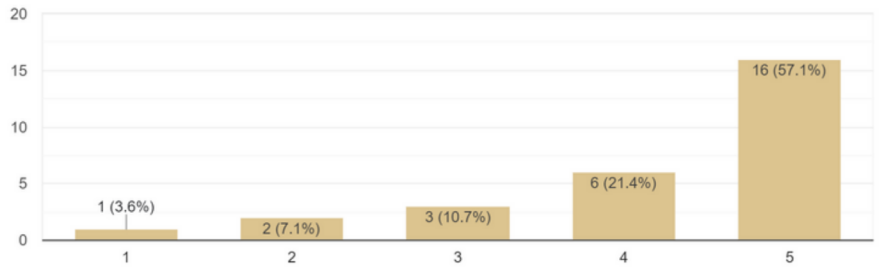

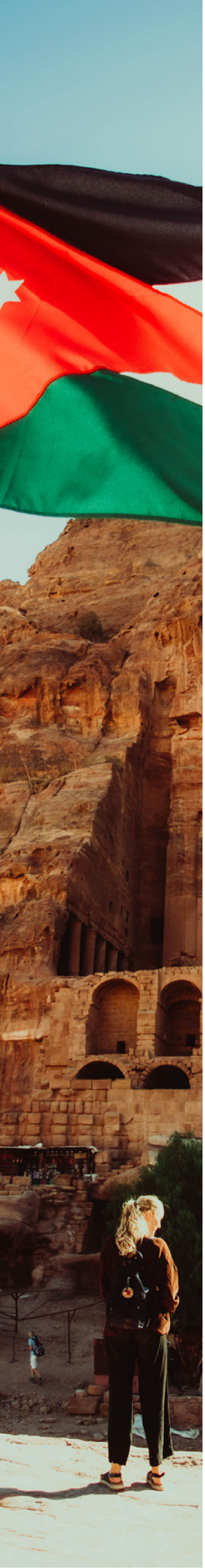

Al Tabun (Traditional Oven)
الطابون

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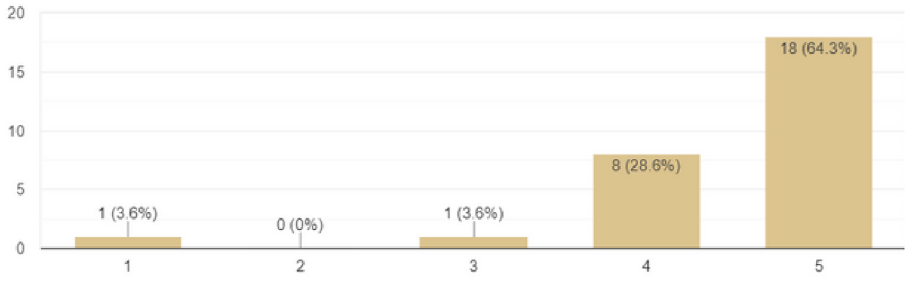

Phytotherapy/Practices
العلاج بالنباتات

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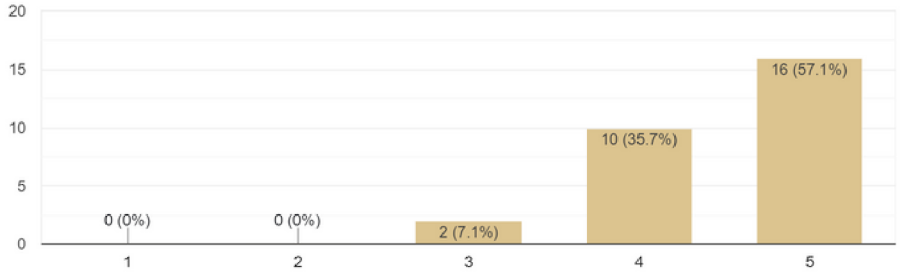

Production of Al Jameed (dried fermented yogurt)
صناعة الجميد

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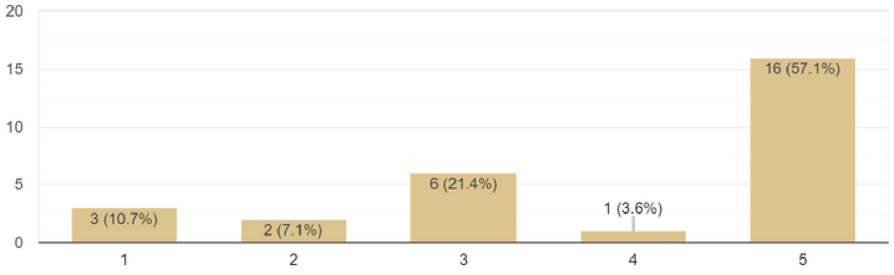

The Art of Dabkka (Traditional Dance)
فن الدبكة

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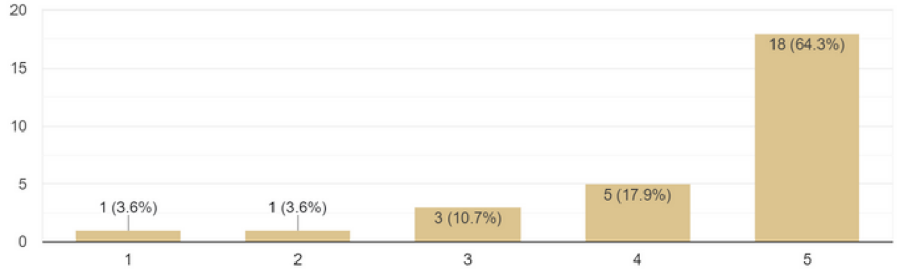


ICH PROPOSED PROJECTS

The data collected contributed to the development of the following projects that can corporate ICH elements and VR/AR technology:

(A) Embroidery Project:

Intangible cultural heritage, such as Jordanian and Palestinian embroidery, can be a significant source of income for individuals and communities. Embroidery is an important form of art and cultural expression that has been practiced for thousands of years and it is a tool for creativity, innovation, and business investment.

In recent years, there has been a growing interest in traditional embroidery as a form of art and cultural expression, and this has led to an increase in demand for high-quality, handmade embroidery products. There are many examples of successful businesses built around traditional embroidery techniques and businesses who post their work on websites for purchase. Therefore, with the use of VR/AR technology traditional embroidery can be promoted.

(B) Documentation of Jordanian Traditional Dishes Project:

Virtual Reality (VR) and Augmented Reality (AR) technologies provide exciting opportunities to preserve and promote the cultural heritage of Arabic food. With VR, interactive cooking tutorials can be created to allow people to learn how to prepare traditional Arabic dishes in an immersive and engaging way. On the other hand, AR can be used to provide additional information about the cultural and historical significance of different ingredients and recipes, deepening people's appreciation and understanding of Arabic food. By leveraging VR and AR technologies, we can not only enhance people's experience of Arabic cuisine, but also ensure that the rich culinary traditions are preserved for future generations. Furthermore, documentation of oral memory related to traditional dishes and archiving them according to contemporary scientific methodologies and origins can play a crucial role in preserving the cultural heritage of Arabic food.

Training and qualifying a local research team on oral history methodologies. Contributing to spreading interest in ICH; and drawing attention to the importance of its protection and preservation. As after the decline in popular traditional food it became necessary to document these dishes to preserve and sustain them. Submitting material

to researchers to conduct research and advance courses in oral heritage. Providing cultural material to benefit from promotion programs and cultural activities. This could happen through the production of a documentary film about Jordanian traditional cuisine.

To achieve the objectives of this project, a local research team of 10 people (males and females) was trained during two intensive workshops on oral heritage collection techniques and field interviews.

The documentation of Jordanian Traditional Dishes Project collected the following:

1. Traditional Jordanian cuisine and sweets.

2. Customs and traditions associated with them.

3. Folk tales of traditional foods recorded in Jordanian social history over the years.

4. Songs, proverbs and poems, terms that cannot be exceeded when talking about this topic.

5. Tools used for cooking.

6. Religious rituals that are a symbol of cultural identity and it has their own peculiarity and food
that have become part of Jordanian heritage.

7. Adding the myths and old stories related to food; for example, the bread and why people in
Jordan kiss the bread when it falls to the ground but not any other food.

8. To have an index for all the different names of the food and the tools used in cooking.

9. Some places may be linked culturally with one another to show how similar or different they are in terms of old stories, foods, used tools, and recipes.

All this information should be used in a creative way to invent an app that helps present this information. For example, a restaurant used a small device to show their food, the way it is going to be poured, and how the food is going to look like in front of the customers.

(C) Documentation of Dabkeh Project:

Dance is a crucial aspect of Intangible Cultural Heritage (ICH), and it is a form of expression that is deeply rooted in cultural traditions and has been passed down through generations. As such, preserving and promoting dance as part of ICH is important for maintaining cultural diversity and identity.

Virtual Reality (VR) and Augmented Reality (AR) technologies can be used to preserve and promote traditional dance as part of ICH. By creating immersive VR experiences, people can learn about the history, cultural significance, and movements of traditional dances from various regions of the world. AR technology can be used to overlay historical and cultural information on live dance performances, enriching the audience's understanding and appreciation of the dance.

DIGITALIZING INTANGIBLE CULTURAL HERITAGE CRAFTS

Expected Achievements:

18 research agreements among universities, researchers, and SMEs, 6 new training programs, 76 new innovative products/services, and creating the Regional Center for the safeguarding of Mediterranean ICH.

This project includes:
1. Pottery
2. Traditional Dresses
3. 3D modeling for the tombs:

- **For 3D modeling:**

1. Drones were used (outside the tombs)
2. Photogrammetry: by taking lots of pictures to make 3D modeling to use in the prototype.

Note: 3D modeling needs laser scanners, but because of the high cost, a mobile app called 'Polycam' isused instead. This app provides high-quality and details pictures even in different lighting conditions.

- **Traditional Dresses:**

'Polycam' was also used to take pictures of the dresses to make models. People can handle the model and turn it from all directions to see how it looks.

Note: there will be visits to the Jordan Museum and The Petra Museum to make models of the items there to add them to the website and eventually create a virtual museum on the website.

We get measurements from the 3D captured by the app.

- **Herbs and Traditional Medicine Project**

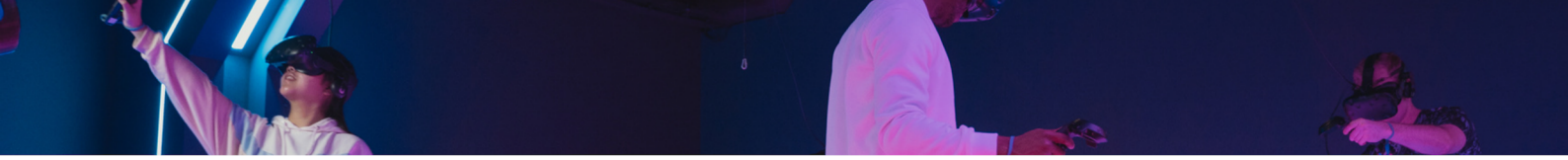
Talking about the various herbs that are used in traditional medicine, recipes, and advantages of these herbs. In addition, talking about people's experience with these herbs.

JOB OPPORTUNITIES

Mr. Mohammad Maharmih is a representative of Elements Company which works in the field of VR/AR. This company has several job opportunities, this company needs Architects, Designers, and 3D experts.

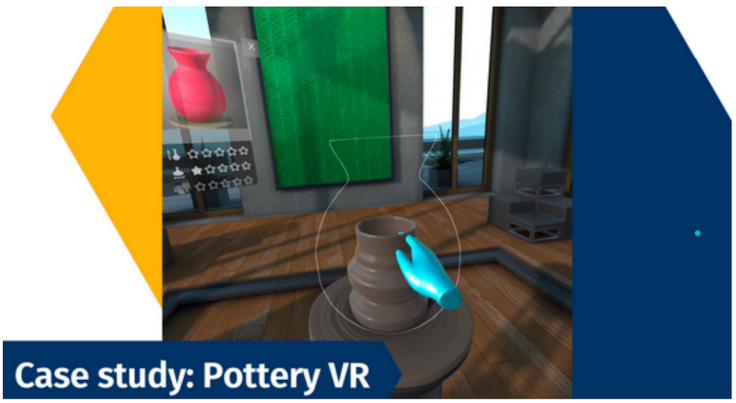
The two requirements for these opportunities are the following:

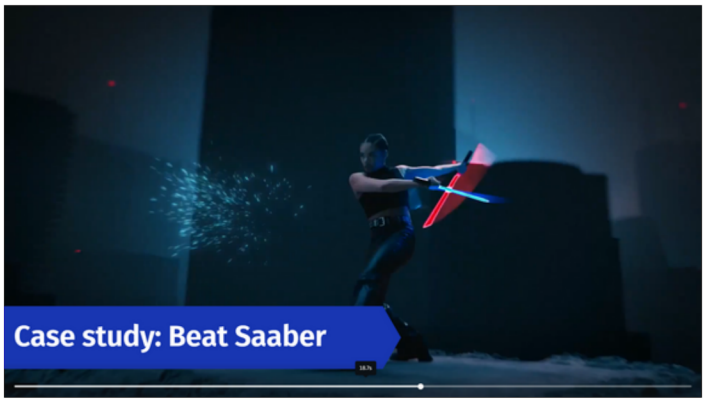
1) Candidates must be Jordanians
2) Candidates commit to the training that is going to be held in Amman.



CASE STUDIES

Case studies provide a valuable opportunity to learn from the successes and failures of other projects. By analyzing case studies, project planners can gain insights into the strategies and approaches that have worked well in similar projects, as well as the challenges and obstacles that may need to be addressed. Especially when it comes to the VR and AR industry, it is important to look at case studies for educational purposes and inspiration. Here is some of the VR / AR projects that Bee Labs a gaming and animation services studio based in Amman, Jordan created.





CONCLUSION

Living Labs are innovative workshops aimed at exploring the potential of modern technologies in promoting cultural heritage sites. These workshops aim to generate investment opportunities for the development of applications that leverage VR/AR/MR technologies to create new revenue streams and employment opportunities for graduate students seeking relevant skills and experience.

In the context of the innovation matrix, it is important for businesses in this field to build upon existing technologies, rather than reinventing the wheel. VR/AR/MR technologies are readily available, and new businesses must focus on utilizing them creatively to promote and preserve Intangible Cultural Heritage (ICH).

To foster innovation in this field, the Archeology Department is planning to launch a competition for participants with AR/VR/holographic apps related to cultural heritage. The competition will encourage participants to create innovative solutions for iHERITAGE projects, and the top six winners will receive cash prizes to support and promote their innovative ideas.

By encouraging innovation in this way, the iHERITAGE project aims to leverage cutting-edge technologies and creative thinking to promote the preservation of cultural heritage sites and create economic and employment opportunities in the field.

VIDEOS FROM THE IHERITAGE PROJECT

1 INTRODUCTION TO IHERITAGE PROJECT
https://www.youtube.com/watch?v=7Npbx0Pc-8A&t=922s

2 IHERITGE PROJECT, THE CONVENTION FOR SAFEGUARDING INTANGIBLE CULTURAL HERITAGE PROF. HANI HAYAJNEH
https://www.youtube.com/watch?v=eBn5oCqr4rY&t=4s

3 IHERITAGE PROJECT_DOCUMENTATION OF JORDANIAN TRADITIONAL DISHES BY MS. HANAN DAGHMASH
https://www.youtube.com/watch?v=r5BHhEqS2MY&t=124s

4 IHERITAGE PROJECT_DIGITIZING INTANGIBLE CULTURAL HERITAGE CRAFTS BY ENG. HANA ABU ALWAFA
https://www.youtube.com/watch?v=l2MUIp9SytQ&t=1438s

5 IHERITAGE PROJECT_MEDICINAL PLANTS IN PETRA - ANCIENT CAPITAL OF THE NABATEANS
https://www.youtube.com/watch?v=KkKXfA0_Tv0&t=737s

6 IHERITAGE PROJECT_HOW DOES THE IHERITAGE BENEFIT ME AS AN SME OR AN INDIVIDUAL BY DR. KHALED KHRESAT
https://www.youtube.com/watch?v=DxUyJqKzB_o&t=5s

7 IHERITAGE_INVESTING IN INNOVATION FROM CONCEPT TO ACTION TO BUSINESS MODELING TO PROFIT GENERATION
https://www.youtube.com/watch?v=lK77MNfz8oQ&t=13s

8 IHERITAGE_MYTHOLOGY AND PETRA BY DR. HEBA HAROUN
https://www.youtube.com/watch?v=icIkFlsDoJY

9 IHERITAGE_THE DATABASE OF ICH AT THE MINISTRY - MAIN TRENDS AND FUTURE PLANS_DIALA KASSAB_20.05.2022
https://www.youtube.com/watch?v=Y--4k6sxSq4&t=14s

10 IHERITAGE PROJECT_ IDEAS ABOUT THE USE OF VR AR AND MR IN ICH BY PROF. HANI HAYAJNEH
https://www.youtube.com/watch?v=AGltXI6ZVlw&t=10s

11 IHERITAGE PROJECT_MED GAIMS GAMIFICATION FOR MEMORABLE TOURIST EXPERIENCES BY PROF. DANIEL ASMAR
https://www.youtube.com/watch?v=2ryhF9_nsSg&t=90s

12 IHERITAGE PROJRCT_GUIDED TOUR IN PETRA BY MR. YOUSSEF HILO
https://www.youtube.com/watch?v=bqVBRP1toK8&t=1094s

13 IHERITAGE PROJECT PRESS CONFERENCE
https://www.youtube.com/watch?v=TYon2ox1TFo&t=106s

14 IHERITAGE PROJECT - LOCAL SUPPORT GROUP MEETING
https://www.youtube.com/watch?v=nEKssg_dMW4&t=1s

VIDEOS FROM THE IHERITAGE PROJECT

15 IHERITAGE PROJECT - HOLOGRAPHY LIVING LAB MEETING
https://www.youtube.com/watch?v=s7GSs5LIicU&t=4s

16 IHERITAGE PROJECT_BEST PRACTICES IN WED DESIGN FOR MUSEUMS ENG. NARMEEN MARJI & ENG. THAMER KARRIAN
https://www.youtube.com/watch?v=1N3PRvvs9bY&t=1302s

17 IHERITGE PROJECT_PROPOSED THEMES FOR THE PROJECT IN JORDAN BY DR. KHAIRIEH AMR
https://www.youtube.com/watch?v=9Z7CIpnwfp8&t=14s

18 IHERITAGE PROJECT_INNOVATIVE APPLICATIONS IN VR RELATED TO CULTURAL HERITAGE BY MR. KARARRO
https://www.youtube.com/watch?v=59clXZYgpcY&t=767s

19 IHERITAGE PROJECT_ARVR & HOLOGRAPHY EXAMPLES FROM IHERITAGE-JO BY ENG. NARMEEN MARJI
https://www.youtube.com/watch?v=OIzzrblDz6A&t=1015s

20 AR/VR MEETING – INTRODUCTION
https://www.youtube.com/watch?v=TpuBdqypdbQ&t=2s

21 LIVING LAB: INTRODUCTION TO HOLOGRAPHY
https://www.youtube.com/watch?v=7lncm7Z66tQ&t=2164s

22 LIVING LAB: MED GAIMS: GAMIFICATION FOR MEMORABLE TOURIST EXPERIENCES
https://www.youtube.com/watch?v=2ryhF9_nsSg&t=90s

23 LIVING LAB: GUIDED TOUR IN PETRA
https://www.youtube.com/watch?v=bqVBRP1toK8&t=1094s

24 LIVING LAB: THE ARCHAEOLOGICAL ARTIFACTS FOR THE VIRTUAL MUSEUM IN IHERITAGE
https://www.youtube.com/watch?v=BH9ndzhnrFs&t=25s

25 LIVING LAB: HOLOGRAPHY EXAMPLES FROM THE INTERNET
https://www.youtube.com/watch?v=plOo_fDZCbA&t=4s

26 LIVING LAB: CONTEXTUAL INTERPRETATION OF HERITAGE CONTENT FOR VR/AR MEDIA
https://www.youtube.com/watch?v=fqIXBuJFH8o

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