2020-1-UK01-KA227-YOU-094543

IO1- A3: Digital Design Compendium
Module: How to apply Digital Design in Heritage
Tourism: case studies / success stories

KA2 - Cooperation for innovation and the exchange of good practices
Partnerships for creativity

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REVISION HISTORY

Version	Date	Author	Description	Action	Pages
1.0	20/12/2021	NTC BG GUIDE	How to apply Digital Design in Heritage Tourism: case studies / success stories	C	22

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REFERENCED DOCUMENTS

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1	2020-1-UK01-KA227-YOU-094543		HerTour4Youth Proposal
2			

APPLICABLE DOCUMENTS

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1	Deliverable IO1.A2		Elaboration of Training Methodology
2			

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1.   Introduction

In this module, students will get acquainted with the various applications of the digital design concept in heritage tourism (reconstruction of lost or damaged heritage, grant access with virtual tours, valorization and awareness through promotional content creation, immersive experiences as a way to differentiate and compete) through examples of success stories and good practices from the partner countries: United Kingdom, Netherlands, Italy, Bulgaria and Greece.

1.1   Learning Outcomes

After completing this module, you will be able to:
- LO1: Recognize the applicability of digital tools and practices in Tourism
- LO2: Be able to self-reflect on gained knowledge
- LO3: Apply digital design skills in similar cases

1.2   Key words

Digital design, web application, digital technologies, digital heritage, immersive experience

1.3   Estimated seat time

3 hours.

1.4   Glossary of terms

Cyber-archeology: *it is a branch of archaeological research concerned with the digital simulation of the past.*[1]

Cyber archaeometry: *it is a new virtual application of scientifics techniques in in the environment of cultural heritage and archaeology.*

Photogrammetry: *it is the art and science of extracting 3D information from photographs. The process involves taking overlapping photographs of an object, structure, or space, and converting them into 2D or 3D digital models.*[2]

Digital archiving*: it is a repository of digital material that a company or person desires to keep for a longer period of time. It stores collections of digital information such as documents,*

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[1] https://www.oxfordbibliographies.com/view/document/obo-9780199766567/obo-9780199766567-0207.xml
[2] https://www.autodesk.com/solutions/photogrammetry-software

video, pictures, etc in a digital format with the intention of providing long-term access to the information.[3]

Immersive experience: is about designing *levels of interactions and manipulations in form of VR, AR which let users be fully absorbed in experiencing a realistic digital atmosphere.*

Gamification: *is about adding game mechanics into nongame environments, like a website, online community, learning management system or business' intranet to increase participation. The goal of gamification is to engage with consumers, employees and partners to inspire collaborate, share and interact.*[4]

Web Graphics Library: *it is an application programming interface (API) tool for building 3D graphics into a Web browser. It is one aspect of creating modern and advanced 3-D images or animations for new projects built on the Internet.*

Strategy videogame: it is a type of video game which demands strategic and tactical thinking and planning and involves logistical challenges to achieve victory.[5]

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[3] http://falcondocs.com/blogs/2019/03/01/what-is-digital-archiving

[4] https://www.biworldwide.com/gamification/what-is-gamification/

[5] https://en.wikipedia.org/wiki/Strategy_video_game

2. Application of Digital Design in Heritage Tourism: case studies / success stories

2.1 Key Application and Use of Digital Design in Heritage Tourism

Thanks to the application of digital technologies, scientific research and conservation methods in cultural heritage evolved and allowed the understanding and discovery of significant hidden relics. Cyber-archeology, cyber archaeometry, photogrammetry, digital archiving and preservation are some of the techniques used to virtually investigate, stimulate, and understand facts and concepts of our heritage assets and ultimately to save them and pass them on to the next generation[6].

At the same time, the digital innovation had transformed how a tourist may experience the cultural heritage and had enhanced new interpretative representations allowing a diversification of the tourism offer with products that absorb and immerse the consumer' mind into the realms of cultural heritage[7]. Virtual tours for an online visit of a museum or a heritage place, a 3D representation of a fragile artefact allowing visitors to manipulate it without risk of damage, or a 3D avatar of a historical figure narrating an interactive story to the audience, are few of the application of digital design in bringing culture heritage to life with its capacity of communicating knowledge and awareness to visitors.

The use of Digital communication in the context of cultural heritage helped the creation of new value chains in heritage tourism by boosting both the production and consumption of value-added experiences and products. For instance, the market for commercial entertainment games had seen a significant growth during the last years and will continue to grow, as gamification app are being more and more used and applied to engage users in cultural awareness, education, training and evaluation[8].

The different application and use of digital technologies in Heritage tourism can vary, as shown in Figure 1[9] below:

- Improving the image of a tourist destination;
- Increasing the attractiveness of heritage places;
- Promoting and revitalizing intangible cultural heritage;

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[6] Novel Ways of Discovering, Capturing and Experiencing Cultural Heritage: A Review of Current State-of-the-Art, Challenges and Future Directions, Dimitra Pappa and Constantin Makropoulos, April 2021, https://www.intechopen.com/online-first/78132

[7] S.a.a.

[8] 2019, Technology watch report - Gamification and Cultural Heritage, HUBB30 Alliance

[9] https://www.intechopen.com

- Immersing and engaging visitors within an innovative content and experience;
- Acquisition of visitors with immediate information and knowledge;
- Granting access to protected or endangered heritage artefacts or spaces;
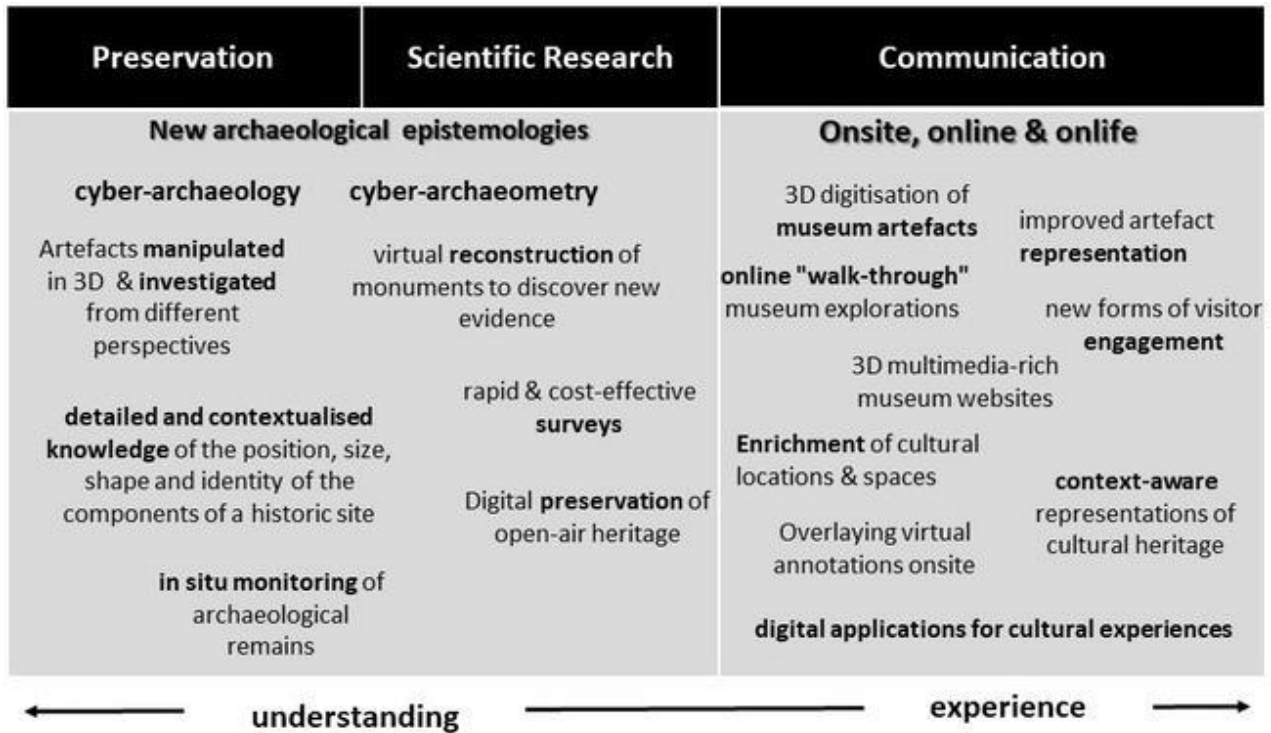- Reconstruction of damaged heritage sites or objects.

Preservation	Scientific Research	Communication
New archaeological epistemologies		**Onsite, online & onlife**
cyber-archaeology **cyber-archaeometry**		3D digitisation of **museum artefacts** improved artefact **representation**
Artefacts **manipulated** in 3D & **investigated** from different perspectives	virtual **reconstruction** of monuments to discover new evidence	**online "walk-through"** museum explorations new forms of visitor **engagement**
	rapid & cost-effective **surveys**	3D multimedia-rich museum websites
detailed and contextualised knowledge of the position, size, shape and identity of the components of a historic site	Digital **preservation** of open-air heritage	**Enrichment** of cultural locations & spaces **context-aware** representations of cultural heritage
		Overlaying virtual annotations onsite
in situ monitoring of archaeological remains		**digital applications for cultural experiences**

← understanding —————————— experience →

Figure 1 Key application of digitalization in cultural heritage

Source: Novel Ways of Discovering, Capturing and Experiencing Cultural Heritage: A Review of Current State-of-the-Art, Challenges and Future Directions, Dimitra Pappa and Constantin Makropoulos, April 2021, https://www.intechopen.com/online-first/78132

2.2 Success Stories in Application of Digital Design in Heritage Tourism

The application of Digital Design in Heritage Tourism nowadays reconfigures the user experience. To show the tremendous use of it, initiatives, showing different scope of application methods of digital design in the context of Heritage Tourism, were further identified, and analyzed in all HerTour4Youth partner countries. They are aiming mainly to promote the heritage and enhance the visitor's experience.

The success stories/good practices were identified based on the following set of selection criteria:

- Repeatable (the project idea can be replicable anywhere easily),
- Creative/innovative (in its content, topic, process or methodology, the creativity of the project opens a broader reflection on the cultural heritage),
- Sustainable (the project uses local resources and may exist over a long period of time),
- Effective and useful (results and benefits address the needs of the cultural heritage "consumer" or it is needed for a utile cause (reconstruction, promotion, grant access)

United Kingdom

✓ **Granting free access to museum collection**

The Museum of the World is an online interactive exhibition to showcase the museum' collection with its two million years of history and culture and thus granting free online access to a large worldwide public.

Through a partnership with Google, the British museum took on a new mission to become the *Museum of and for the World* giving people new ways to access and experience the museum, and new ways to learn and teach[10].

The whole Museum was captured through Street view, the Google tool for VR photography, allowing a virtual walking tour in every permanent gallery and around its outdoor buildings.

Every object and artefact in the Museum were captured with a very high-resolution to give the explorer a closer look than what could be seen with in reality[11].

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[10]https://europe.googleblog.com/2015/11/the-british-museum-museum-for-world.html
[11] https://europe.googleblog.com/2015/11/the-british-museum-museum-for-world.html

The website uses the most advanced available Web Graphics Library technology, allowing users to go back in time and explore different objects from different cultures with the possibility to listen to the British Museum curators telling their stories on each item[12].
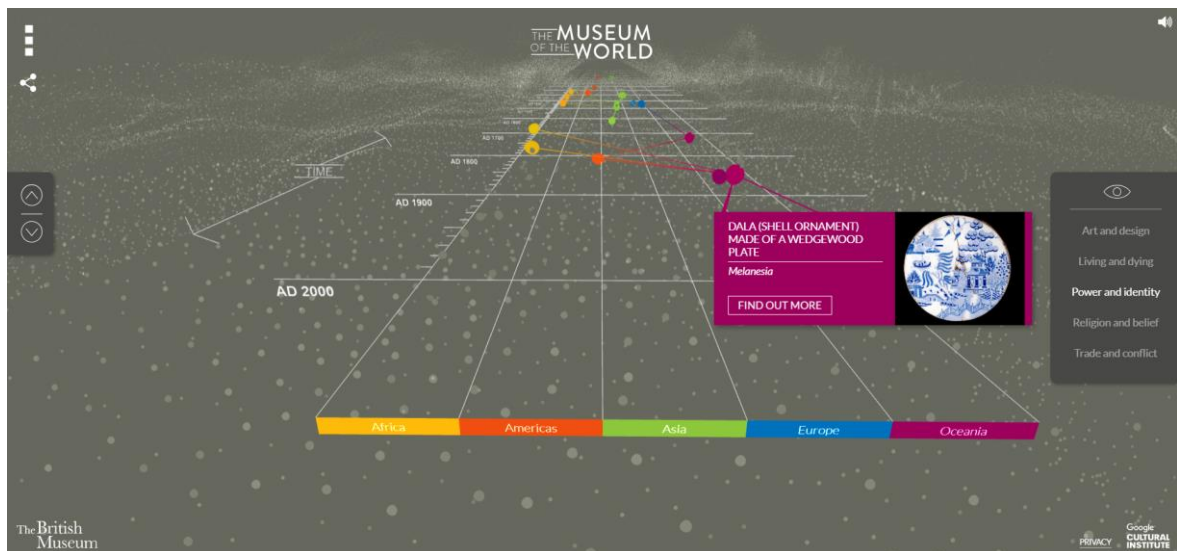

Figure 2 Display of the Museum of the World web iterface[13]

✓ **Promoting the cultural image of a destination**

Born as a collaboration between the Cambridge City Council, two art companies and a tech-design agency, t**he Cycle of Songs App** is an audio-visual guide developed as a response to promote the history and identity of the city of Cambridge during the 2014 Tour de France.

It aimed at offering visitors a memorable experience of the different celebrations and activities which were planned in the city by discovering songs and poems based and inspired from original stories and places located along the cyclists' route on their way to London.

It is a GPS location-based app which includes nine pieces of songs and audio poems to listen to along the Tour and which are linked to a map of the city with its historical and urban places. The app is supplied with audio content and photos for each location, along with an app leaflet with instructions.

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[12] https://britishmuseum.withgoogle.com/

[13] https://britishmuseum.withgoogle.com/

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The songs were performed by local choirs, schools, and artists, and curated by historians, composers, and musicians from the city.

Figure 3 Graphical user interface of the Cycle of Songs app

Source: www.calvium.com

Netherlands

✓ **Engaging visitors with an online immersive experience**

Being famous with its fables and fantasy-based attractions, the Efteling Theme Park aimed at keeping its visitors engaged while waiting on the queue to access their favorite attraction by using **the Efteling App** on their smartphones.

The mobile app includes a digital version of the park map with GPS location, helping visitors to locate themselves. Through the app, the visitors have a real-time overview of the waiting times for all attraction and a notification to join the shortest queue.

The app incudes an **Augmented Reality game** for kids - **Fairy and the Safe**- to play on their smartphones while waiting in the park: in the "Fairy and the Safe" interactive game, players need to collect and save as many coins as possible in one minute while trying to avoid and escape escaping from the witch who will steal the coins if the player run into her.

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The game also includes an interactive audio fairytale for kids to teach the witch to save money, so she won't have to steal it any longer[14].
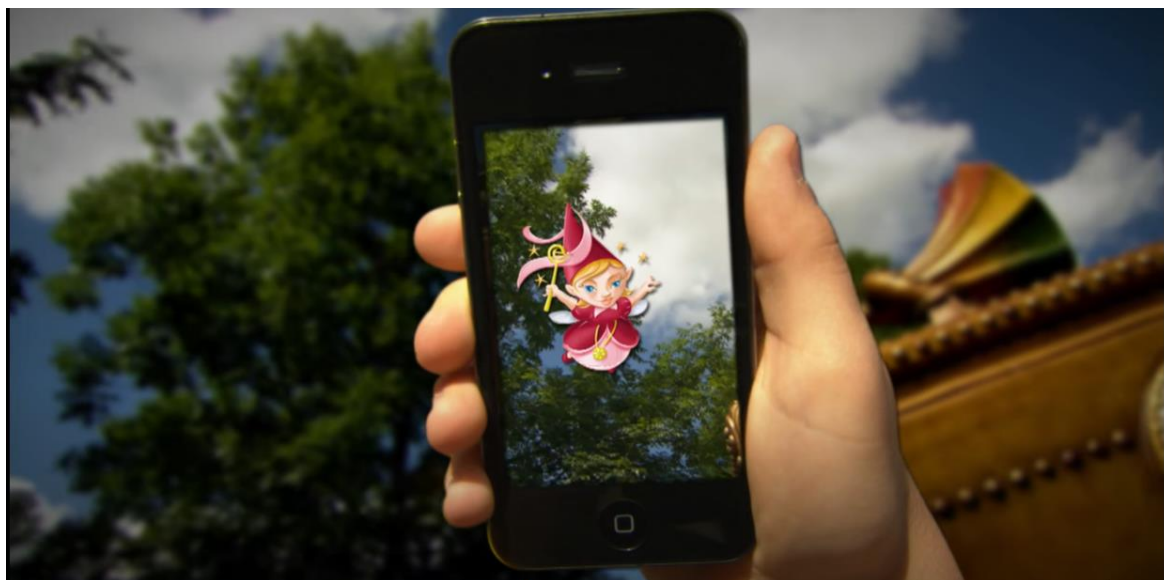

Figure 4 Efteling AR Game App "Fairy and the Safe"

Source: www.efteling.com

✓ **Raising awareness over the protection of unique natural and cultural heritage**

"Het Groninger Landschap" is a charitable organization working for the protection of nature, wildlife, and cultural heritage in the Province of Groningen in The Netherlands in a way that the natural value or landscape quality is preserved or even enhanced. They protect and develop around 8000ha of nature reserves and 35 cultural monuments in the region.

In order to raise awareness on the values of the unique cultural and natural landscapes and places and to promote their activities to a wider public, **a web platform** was designed and developed for the "Het Groninger Landschap" organization.

The website is like an Atlas, assembling all the natural areas and heritage places located in the province and providing the potential visitor with informative and visual representation of all the happening activities and trips.

Through the website, the local community has the opportunity to be an engaged and active contributor in protecting the nature and the heritage by means of working, volunteering, sponsoring or donating.

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[14] https://www.layar.com/news/blog/2011/06/29/an-augmented-reality-fairytale-game-at-the-efteling-theme-park/
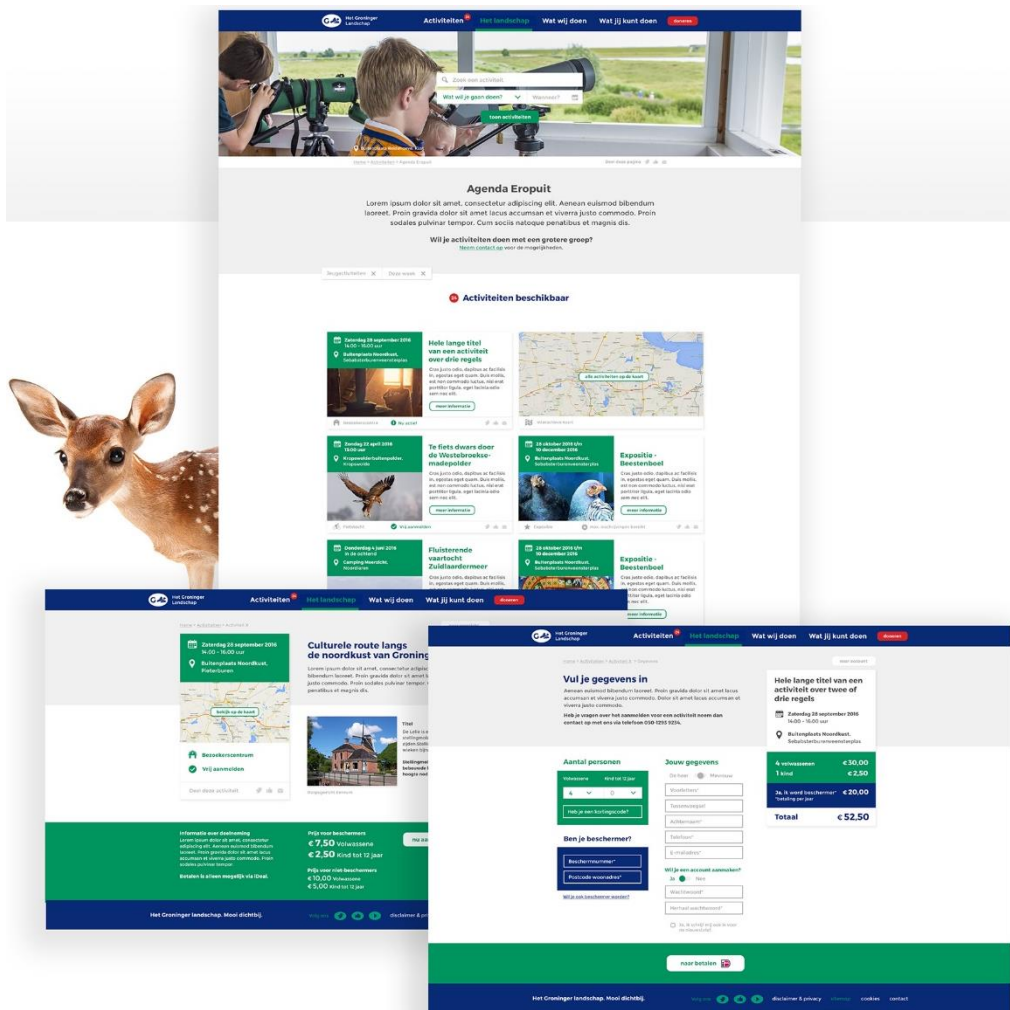
Figure 5 Different webpages of the "Het Groninger Landschap" organization

Source: Gealt Waterlander Designer[15]

Italy

✓ **Offering onsite immersive experiences to museum visitors**

Through a special homage to Dante Alighieri, the Ravenna municipality and Touchwindow (a company specialized in digital transformation and innovation) renewed the spaces of the poet' museum, with **a technological refitting of the exhibitions,** designed for offering an interactive and an immersive user experience and engagement.

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[15] **https://www.behance.net/gallery/60423281/Het-Groninger-Landschap?tracking_source=search_projects_recommended%7Cgroninger%20landschap**

The project consisted of redefining the museum's visual identity and of rearranging the different rooms of the museums in order to serve newer functionalities, while using and preserving all objects and artifacts in the museum.

To achieve this purpose, a combination of digital technological tools was used to inform, educate, and surprise the visitor: **interactive projections** (holographic screens and images, movable texts), **didactic and graphic interactive contents**, **QR contents**, **videomapping**, **multi-touch displays**, **motion and sound sensors** (bells' sounds).
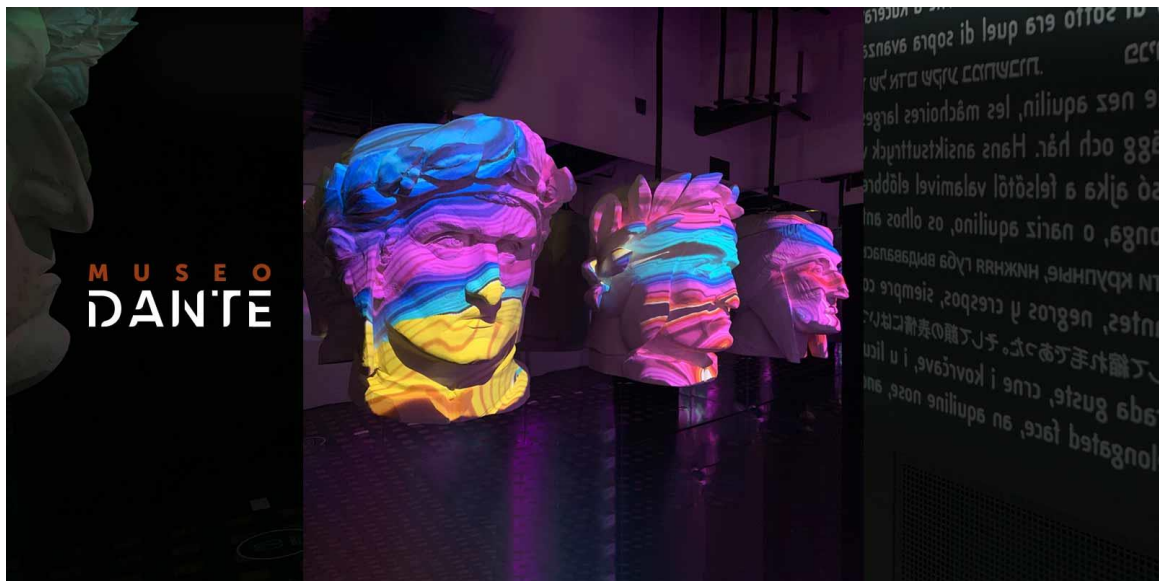
Figure 6 Text and light projection in Museo Dante

Source: www.touchwindow.it

✓ **Gamification for cultural heritage promotion**

A fruitful collaboration between parks, archaeological areas, museums and other cultural institutions from the regions of Tuscany, Umbria, and Lazio, and Entertainment Games App company (an IT company specialized in designing and developing mobile app and games app) resulted in the creation of a **video game app** about the Etruscan civilization, an ancient culture which prospered in those regions.

Mi Rasna – I am Etruscan is a strategy videogame which aims at promoting the rich historical and archaeological heritage of the Italian territory, while taking the user on an original and explorative journey of the ancient Etruscan people.

The game contained quizzes and is based on historical facts and figures and displays archeological artefacts.

It consists of geolocating the player around the 12 important Etruscan cities, known as the Dodecapolis. The player, who impersonates the role of the Etruscan ruler, has to

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manage the cities, and make them prosper. To do this, the player has to advance city by city, by creating and collecting its resources, unlocking skills and tools, constructing buildings, developing commercial relationships and deals.

Figure 7 Mi Rasna Game interface

Source: www.egameapps.com

Bulgaria

✓ **Telling folklore stories through animation**

Based on the mystical worlds of the Bulgarian myths and legends, Studio Zmei –a Bulgarian animation and storytelling studio- developed **the Golden Apple cartoon series**, to tell the stories of the old traditions and lessons hidden in a modern and interactive way.

The way of making the cartoon series is quite inspirational. The Team of Studio Zmei has traveled along more than 30 villages in the country to gather and analyze stories suitable for the concept of the "Golden Apple", so they can pass trough the generations and not to be forgotten. And these are stories about fairies, goblins, dragons in human form, etc.…

The style of the 2D animation illustration uses folklore graphic symbols and motifs for representing architectural decorations, costumes, songs, and rituals. The soundtracks of the series are also inspired from the Bulgarian folklore music.

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As a prequel to the cartoon series, a short film and book on **the legends of the first Kuker warrior** were released. The film was subtitled in English language and the project gained a wider interest for cooperation.

Figure 8 The Kuker figure From the legends of the first Kuker warrior

Source: www.studiozmei.com

✓   **Online tour guide for promoting urban markets as part of cultural tourism**

Through the project "City and markets – opportunities for cultural tourism", an online tour guide – **the Urban Market Guide** – was created, to provide practical information, and reveale historical facts about the city of Plovdiv through its 7 urban markets.

Considered as part of the living culture of Plovdiv, the urban markets in the city became a kind of living museums and a source of storytelling about its neighborhoods, its sellers, the people' habits, the social practices in the market, the products sold, etc.

The guide is available online for free in both English and Bulgarian with a link to Google earth where there is an online map showing the locations of the selected markets. The guide has a printed edition which can be found in hotels and tourist information centers.
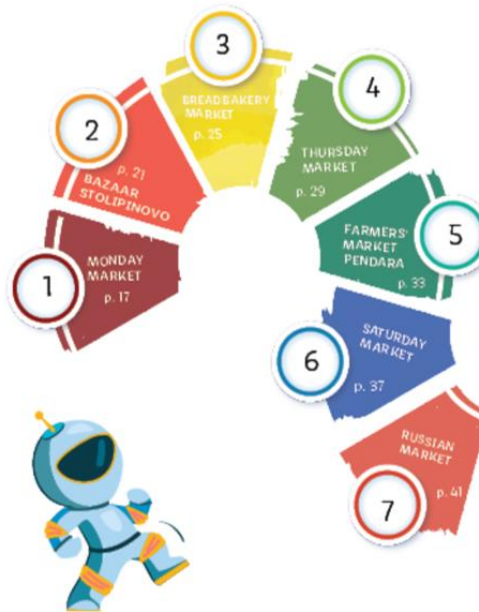
Figure 9 Legend of the Urban Market Online Guide

Source: www.aceamediator.com[16]

Greece

✓ **Promoting the discovery of cultural heritage through mobile app**

The **Walk the Wall Athens** app gives Athens' visitors a unique tour of the historical center of the city by exploring its ancient walls. The innovative mobile application allows the mobile users to learn about the Themistoklean wall surrounding Athens and its connected archaeological sites located in the city.

The app includes an interactive map with 35 points of interest which are accurately coordinating with GPS allowing the user to spot the ancient remains of the city. For each point of interest, there is an audio tour supported with rich visual material and texts both in English and French.

Walk the Wall Athens was developed by Dipylon - a non-profit organization workign in the study of ancient topography and the cultural environment and Fluidmedia - digital marketing user experience studio, with the support of the City of Athens.

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[16] www.aceamediator.com

The app was awarded at the 2018 Mobile Excellence Awards and shortlisted as the best innovative digital solution from Greece at the World Summit Awards, among other competitors from 100 countries[17].
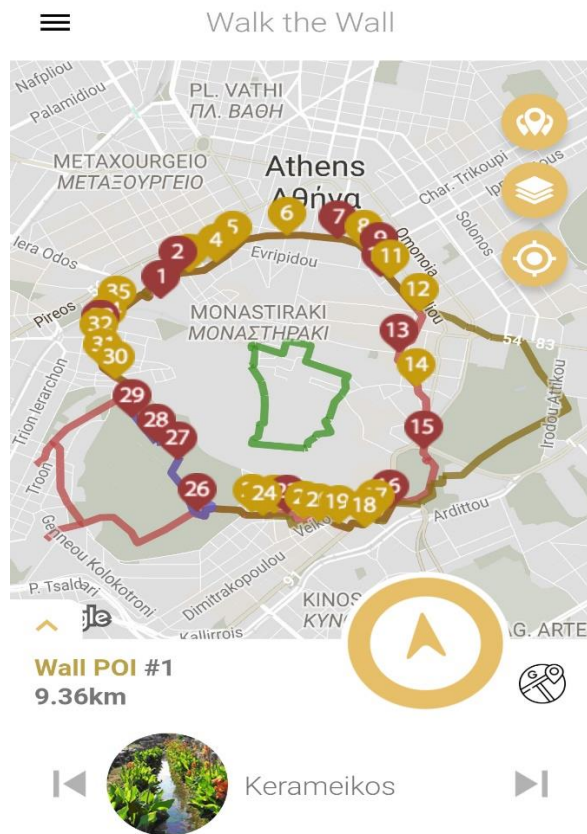

Figure 10 Graphical user interface of the Walk the Wall Athens App

Source: www.dipylon.org

✓ **Engaging and immersing visitors in their tour experience**

The Palace of Knossos in Crete has opened its virtual doors to let its visitors travel back to the fascinating world of the Minoan civilization through a 3D reconstruction of the site using an AR and VR app loaded in a mini tablet.

While visiting the Palace, visitors may purchase **the Knossos 3D tablet** which will be their guide during the visit. The user needs to move the tablet around, up and down to be able to visualize all small details of the site as it was thousands of years ago.

The tablets use a technology of the real time camera's video and many different virtual elements and information (graphics, video, sound, GPS data). The innovative gadget gives

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[17] https://dipylon.org/en/2018/10/05/walk-the-wall-athens-2/

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visitors virtual access to rooms which are not open to the public (for example the famous Throne Room or the Queen's Chamber).

The tablet also includes a 3D animation of ancient Greek sport and an audio guide to entertain the kids and teach them about the Greek myths and heroes.[18]

Figure 11 The Knossos 3D tablet

Source: https://www.elissos.com

2.3 Main Conclusions

"Digitalization is the backbone for innovating many business processes in cultural tourism, both on demand and supply."[19] The analyzed success stories and/or good practices highlight the broad scope of use and application of digital design in the Heritage tourism. Various aspects are revealed, mostly enriching the user's/visitor's experience, improving the attractiveness of a destination or a heritage place, promoting intangible heritage, etc. The digitalization of tourism is encouraging entrepreneurs to find innovative solutions to promote a destination or a market, to open to new opportunities, to design tailored digital solutions for the tourism industry, incl. the heritage tourism.

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[18] https://www.kidslovegreece.com/en/tours/palace-knossos-3d-app-unique-guiding-tool-families/
[19] Digital business models in cultural tourism, Salvatore Ammirato & co-authors, May 2021, https://www.emerald.com/insight/1355-2554.htm

3.   Assessment

3.1   Knowledge assessment

Quiz-like assessment based on the main content. Please mark the correct answer with bold when required. Include 10 questions for your module. Increase gradually the level of difficulty.

Question 1(multiple choice or true/false): Digital technologies contribute to the conservation of heritage sites
[True] [false]

Question 2 (multiple choice or true/false): Digital technologies may improve a destination image.
[True] [false]

Question 3 (multiple choice or true/false): Online tours are one of the methods to discover a museum's collection.
[True] [False]

Question 4 (multiple answers correct): Which of these techniques is used for Heritage preservation?
[cyber-security] **[cyber-archeology] [Cyber-archaeometry]** [Cyberspace]

Question 5 (multiple answers correct): Which of these digital tools is used for designing immersive experience?
[Gamification] [QR content] [web platform] **[3D projections]**

Question 6 (multiple answers correct): Kids may experience cultural heritage through
[strategy game] [**Audio content**] **[2D animation]** [film making]

Question 7 (multiple answers correct): the application of digital design tools in Heritage Tourism is obligatory for
[improving the economy of the tourism destination] [increasing the numbers of booked hotels in a destination] **[Granting access to protected or endangered heritage artefacts or spaces] [Reconstruction of damaged heritage sites or objects]**

Question 8 (matching): Match the terms with their definitions.
Cyber-archeology: *it is a branch of archaeological research concerned with the digital simulation of the past.*
Cyber archaeometry: *it is a new virtual application of scientifics techniques in in the environment of cultural heritage and archaeology.*

Photogrammetry: *it is the art and science of extracting 3D information from photographs. The process involves taking overlapping photographs of an object, structure, or space, and converting them into 2D or 3D digital models.*

Question 9 (matching): Match the concepts with their explanations.

Digital archiving: collecting and storing digital information in one single platform for providing long term access.

Immersive experience: is about designing levels of interactions and manipulations in form of VR, AR which let users be fully absorbed in experiencing a realistic digital atmosphere.

Gamification: is using online games for the purpose of educating, raising awareness, increasing participation.

Strategy videogame: it is a type of video game which demands strategic and tactical thinking and planning and involves logistical challenges to achieve victory.

3.2   Skills assessment

➢ Search for a cultural heritage asset (could be a folklore story, one of the collections from a museum, a heritage locations) in your country that it is not well promoted and known by the national and international audience. Collect text and images about it.

➢ Based on this, think of developing your own promotional slogan or text with interpretive symbols and images derived from the cultural heritage asset you chose. The idea is to write a text which will attract viewers to discover more about it.

➢ Go to *Canva.com* and design a poster or a video for the promotion of your cultural heritage using the text and images that you collected.

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