

A GAMIFICATION MODEL FOR COMMUNITY-BASED HERITAGE WORK: SELECTED BEST PRACTICES

Synthesis study



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SYNTHESIS STUDY



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Introduction

The transition to a fully democratic cultural citizenship in heritage safeguarding necessitates the active involvement of individuals, communities, cultural practitioners, and youth, particularly from academic institutions and heritage communities. According to the principles outlined in the Porto Santo Charter (PSC), heritage professionals must strive for a paradigm shift that acknowledges and respects the knowledge, traditions, and voices of all stakeholders. This approach does not seek to impose culture onto a territory; rather, it recognizes and elevates the existing local culture while integrating diverse cultural expressions. This fosters a dialogue that bridges local experiences with universal cultural narratives, enriching both in the process.¹

Over the years, the role of communities in heritage work, both as individual citizens and collective actors, has repeatedly gained traction in both discussion circles and practical applications. The rapid emergence of new technological applications, combined with the social and cultural shifts occurring in post-pandemic Europe, and the attention garnered by innovative intervention techniques such as gamification strategies and serious games, provides a valuable opportunity to push the boundaries of the Cultural Heritage sector. A 2022 research study revealed that Europe and its higher education institutions remain central to these initiatives. However, the study also noted that heritage games often emerge as isolated, not replicable, one-time projects. There is considerable potential for

¹ The Porto Santo Conference, a Portuguese Presidency of the Council of the European Union Initiative, *Porto Santo Charter, Culture and the Promotion of Democracy: Towards a European Cultural Citizenship* (Porto, 25th April, 2021): 6, <https://portosantocharter.eu/the-charter> (accessed July 15th, 2024).

developing more substantial networks and fostering collaborative work between authors and institutions. Such efforts would help to unify and strengthen the field, promoting the continuity and depth needed to fully leverage the potential of gamification in heritage work.²

This urgency and opportunity are especially relevant in low-density territories. As highlighted by the European Parliament Committee on Transport and Tourism, these areas face locational disadvantages that lead to low socio-economic development and historically receive less technological investment. Moreover, these regions often have significant employment in sectors that rely on cultural and natural landscapes and historical heritage, such as tourism and accommodation.³

Given these factors, the pertinence of the project "A Gamification Model for Community-Based Heritage Work" is greater than ever. This project seeks to actively shift the paradigm by leveraging local solutions and perspectives, fostering meaningful change through a network of European institutions and communities committed to this goal. By integrating gamification and serious games, the project aims to engage communities in heritage work more effectively, thus enhancing cultural citizenship and promoting sustainable development in low-density areas. This aligns with the necessity of adopting a „broader perspective” that enhances collaboration and consolidates robust networks. Such efforts are crucial for bringing cultural objects closer to the public and fostering a deeper reflexivity on cultural heritage. A recent literature review on

² Célio Gonalo Marques, Joo Paulo Pedro, Marta Dionsio, Paula Almeida, Cludia Pires da Silva, "A Systematic Literature Review of Gamification in Cultural Heritage: Where are we? Where do we go?" *Journal of Tourism and Heritage Research* 5, n 4, (2022): 68-75.

³ Romano Bisaschi et al, *Research for TRAN Committee – Transport infrastructure in low-density and depopulating areas* (Brussels: European Parliament, Policy Department for Structural and Cohesion Policies, 2021), 15-20.

gamification in and for cultural heritage underscored these points, emphasizing the need to effectively engage the public, thereby deepening their understanding and appreciation of cultural heritage. By doing so, it encourages a more profound and sustained interaction with cultural heritage, bridging the gap between academic research and public engagement.⁴ This will be a crucial step until the more ambitious goals of establishing international embedded principles on digital heritage and enhancing structural collaboration between global organizations forums in this field are achieved.⁵

The action aims to foster community and civic engagement as well as democratic participation in the cultural heritage sphere of low-density territories. It seeks to create an operable framework and provide tools for gamification strategies and techniques for community-based/led heritage work. Additionally, the project aims to foster partnerships and practice-oriented learning between local communities, academics, and university students. Another key objective is to disseminate the benefits of gamification and community-based approaches in heritage.

Titled “A Gamification Model for Community-Based Heritage Work” (No. 2023-1-PT01-KA220-HED-000154261), the project is implemented within the framework of the Erasmus+ program during 2023-2026. The partnership includes the Polytechnic University of Tomar (Portugal), D. A. Tsenov Academy of Economics (Bulgaria), Valahia University of Targoviste (Romania), University of South

⁴ Célio Gonalo Marques, Joo Paulo Pedro, Ins Arajo, „A Systematic Literature Review of Gamification in/for Cultural Heritage: Leveling up, Going Beyond,” *Heritage* 6 (2023), 5935–5951, <https://doi.org/10.3390/heritage6080312> (accessed January 24th, 2024).

⁵ Vctor Manuel Lpez-Menchero Bendicho, Mariano Flores Gutirrez, Matthew L. Vincent, Alfredo Grande Len, „Digital Heritage and Virtual Archaeology: An Approach Through the Framework of International Recommendations”, in *Mixed Reality and Gamification for Cultural Heritage*, ed. Marinos Ioannides, Nadia Magnenat-Thalmann, George Papagiannakis (Geneva: Springer International Publishing, 2017), 3-28.

Bohemia in České Budějovice (Czech Republic), University of Trnava (Slovakia), University of Camerino (Italy), and Adana Science and Technology University (Türkiye).

One of the project's Work Packages (WP) focuses on Best Practices. The primary objective of this WP is to identify and analyze best practices in using gamification for community-based cultural heritage work, including identification, safeguarding, and dissemination.⁶ To achieve this, each project partner from the seven participating countries identified and presented at least two examples of gamification in community-based heritage work. From these, two cases per partner were selected for in-depth analysis. As a result, the booklet includes 14 case studies of best practices. The Work Package (WP) was coordinated by the D. A. Tsenov Academy of Economics and Valahia University of Targoviste. Most of the conceptual and methodological approaches detailed in the project are based on the document titled *List of Criteria for Best Practices*, authored by the D. A. Tsenov Academy of Economics. The analysis of the best practices is conducted by Valahia University of Targoviste based on the contribution and the files filled out by all the partner institutions.

⁶ An extended analysis of the conceptual framework and methodology at Marusya Smokova, Célio Gonçalo Marques, João Tomaz Simões, Lígia Mateus, Silviu Miloiiu, Sergiu Musteață, and Evelina Parashkevova, *A Guide to Identifying Best Practices for Gamification in Cultural Heritage* (Svishtov: Academic Publishing House "Tsenov," 2024)

Best Practices in Gamification for Community-Based Heritage Work: A Conceptual and Methodological Framework

Conceptual Framework

Best practice refers to a technique or method that, based on experience and research, has consistently demonstrated its effectiveness in achieving the desired results⁷. It is a standard or set of guidelines known to produce favorable outcomes when adhered to (WHO, 2017).⁸ Additionally, best practices are those that specific groups consider more effective in delivering particular outcomes compared to other methods, and thus, they serve as benchmarks to aspire to.⁹

Best practices should not be interpreted as a state of perfection; the term "best" is not meant in a superlative sense. Instead, best practices serve as benchmarks due to their evidence-based nature. An integral part of best practices is documenting and applying lessons learned about what does not work and why, helping other projects avoid similar mistakes. Sharing and adopting best practices is essential to benefit a broader audience.

In our project, we consider best practices as the knowledge of which gamification tools applied to cultural heritage work achieve

⁷ World Health Organization Regional Office for Africa, Brazzaville, *Guide for Documenting and Sharing "Best Practices" in Health Programmes* (Geneva: World Health Organization, 2008), 6-8.

⁸ World Health Organization Regional Office for Africa, Brazzaville, *A Guide to Identifying and Documenting Best Practices in Family Planning Programmes* (Geneva: World Health Organization, 2017), 6-7.

⁹ M. Andrews, „Document details - The logical limits of best practice administrative solutions in developing countries." *Public Administration and Development* 32, no. 2 (2012): 137-153.

desired results, create sustainable effects, and engage the target community. Identifying best practices involves judgment, requiring prior analysis using two types of criteria: impact and gamification.

Impact criteria are universal and general, applicable to assessing any type of case study or initiative. These criteria measure the degree to which an initiative generates or has the potential to create outcomes and effects in terms of performance, accessibility and inclusion, innovation and creativity, and social and cultural impact. When considering the impact criteria, we evaluate subcriteria such as performance (including effectiveness and sustainability), accessibility and inclusion, innovation and creativity (including originality and creativity), and social and cultural impact (including social development, enhancement of social culture, and multiplier effects).

Effectiveness measures the extent to which the initiative successfully achieved its objectives of raising cultural heritage awareness within the community and increasing local revenues. In evaluating sustainability, we examined the initiative's capacity for long-term maintenance, including its application over an extended period (e.g., a minimum of five years post-implementation) and its potential for ongoing activity delivery, such as continued funding sources at least one year after external support ends.

The initiative's accessibility criterion assesses whether it provides equitable access, allowing all interested parties to benefit from its outcomes and experience the gamification mechanics. Originality evaluates the extent to which the initiative offers a novel and distinct experience to the target community, one that they had not previously encountered. Creativity gauges how the initiative immerses the target community in an engaging 'real world' or 'real age' environment, enabling meaningful interaction with the settings and characters.

Social development criteria measure how effectively the initiative fosters a sense of community among users, making them feel integrated and connected. Cultural impact pertains to how well the initiative enhances the community's awareness and tolerance of local customs, beliefs, religious practices, and cultural expressions. Finally, the multiplier effects criterion examines the generation of beneficial spin-off effects or spin-over effects, where the empowered community acquires durable skills, knowledge, values, and resources that enable them to uplift other communities, leading to collaborative efforts that produce unexpected and positive outcomes.

Gamification criteria are specific to the field of study and provide representativeness from gamification strategies, heritage significance, and IT/technological perspectives. The criteria considered in our assessment were divided into intrinsic motivation heuristics, extrinsic heuristics, and context-dependent heuristics.

Intrinsic motivation heuristics encompass several key components: purpose and meaning, challenge and competence, completeness and mastery, autonomy and creativity, relatedness, and immersion. Purpose and meaning refer to the system's ability to help users identify and pursue meaningful goals that benefit themselves or others, fostering a sense of reflexivity and personal significance. Challenge and competence measure how well the gamification satisfies players' intrinsic need for competence by presenting difficult challenges or goals and enabling them to discover or create new challenges for self-testing. Completeness and mastery pertain to the system's ability to fulfill users' intrinsic need for competence through the completion of a series of tasks or the collection of virtual achievements, such as prizes and trophies. Autonomy and creativity involve affordances that support users' intrinsic need for autonomy by providing meaningful choices and opportunities for self-expression, including the creation of new

content. Relatedness addresses how the system meets users' intrinsic need for social connection through interactions with other players, emphasizing fairness and the encouragement of newcomers. Immersion evaluates how effectively the system enhances users' aesthetic experience through thematic elements, narratives (whether real or fictional), interactions with virtual objects, and pleasurable exploration of the environment.

Extrinsic motivation heuristics include ownership and rewards, scarcity, and loss avoidance. Ownership and rewards refer to affordances designed to help users achieve meaningful goals through the system, which can benefit both themselves and others. These affordances often include mechanisms for providing information and opportunities for reflection aimed at self-improvement. Scarcity involves affordances that motivate users by evoking a sense of status or exclusivity, typically through the acquisition of rare or difficult-to-obtain rewards, goods, or achievements. Loss avoidance pertains to affordances that create a sense of urgency by presenting users with potential losses of acquired or prospective rewards, goods, or achievements if they do not act promptly. This heuristic drives users to engage actively to avoid missing out on valuable incentives.

Context-dependent heuristics encompass feedback, unpredictability, and change and disruption. Feedback involves providing users with information about their progress and guiding them on the next available actions or challenges. This includes offering clear, immediate, and actionable feedback, as well as making progress comprehensible and tangible to the users. Unpredictability refers to the affordances designed to surprise users with variable tasks, challenges, feedback, or rewards. This element is intended to maintain users' curiosity and engagement by introducing elements of surprise and variability. Change and disruption involve affording users opportunities to contribute

positively to the system, such as by suggesting new features or improvements, while managing disruptive tendencies. This heuristic aims to harness users' desire for change in a constructive manner, avoiding negative behaviors like cheating, hacking, or other forms of manipulation.

Assessment Methodology

All partners used the file 'Best Practice Identification Criteria.xlsx' to archive all identified projects, evaluate them, assess inter-rater reliability, calculate final scores, and rank the projects in descending order. The top two projects were defined as 'best practice' for each country. These identified best practices from the seven countries were used to prepare a synthesis report.

Each partner was responsible for collecting information on community-based gamification in cultural heritage projects implemented in their countries. All collected data were archived and coded as follows: CountryCode-xxx, where xxx was the project ID number (e.g., BG-001, BG-002 for Bulgaria; PT-001, PT-002 for Portugal; RO-001, RO-002 for Romania; CZ-001, CZ-002 for the Czech Republic; SK-001, SK-002 for Slovakia; IT-001, IT-002 for Italy; TR-001, TR-002 for Turkey). Coded projects were assigned to raters for evaluation. To minimize subjectivity and rater bias, each project was assigned to two independent raters. Raters evaluated the projects independently, entering their codes and ratings in the 'Gamification Criteria' (GC) and 'Impact Criteria' (IC) sheets. Rater codes followed the format Ryy, where yy was the rater's ID number. Raters used a 6-point scale (5 = very high, 4 = high, 3 = neither high nor low, 2 = low, 1 = very low, 0 = not applicable).

The projects, rated by the raters, were collected in the 'Ratings' sheet and sorted by the rater's code. Ratings for each project from both raters were copied from the 'Ratings' sheet and pasted into the 'Inter-Rater Assessment' sheet to assess reliability (using Paste Special-

Transpose). If the agreement coefficient (cell G24) was $\geq 80\%$, it was highlighted in green, indicating reliable ratings. If the ratings were not consistent, a third rater was assigned to review the criteria and evaluate the project. Once an agreement threshold of at least 80% was achieved (cell T24 highlighted in green), the final project score was calculated as the average of the raters' scores.

All evaluated projects were described in the 'Characterisation' sheet and sorted in descending order by their final project scores. The top two projects with the highest scores were titled as 'Best Practice' for each country.

Typology included tangible, intangible, and natural heritage. UNESCO defines material heritage as the physical manifestations of human creativity and expression that are valued for their cultural, historical, aesthetic, scientific, or spiritual significance. This includes tangible objects, structures, sites, and landscapes that have been created, modified, or used by humans over time and hold cultural significance for communities, societies, or humanity as a whole.¹⁰ Intangible heritage, as defined by UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage, comprises the practices, representations, expressions, knowledge, skills, and cultural spaces that communities, groups, and individuals recognize as part of their cultural heritage. Examples include traditions, oral history, rituals, performing arts, social practices, traditional craftsmanship, and knowledge systems passed down through generations.¹¹ Natural heritage refers to natural features, geological and physiographical formations, and delineated areas that constitute the habitat of threatened species of animals and plants, and natural sites valued for their scientific, conservation, or

¹⁰ UNESCO, *Convention Concerning the Protection of the World Cultural and Natural Heritage: Adopted by the General Conference at Its Seventeenth Session* (Paris: UNESCO, 16 November 1972), 2.

¹¹ UNESCO, *Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage* (Paris: UNESCO, 2022), 5-6.

natural beauty. This includes privately and publicly protected natural areas, zoos, aquaria, botanical gardens, natural habitats, marine ecosystems, sanctuaries, and reservoirs.¹²

The classification of heritage utilized in the assessment was delineated into three categories: local, national, and international. Local assets are defined as those whose preservation and enhancement bear primary cultural significance for a particular community, reflecting the unique heritage and values of that local context. National assets are characterized by their substantial cultural importance at the national level, representing shared heritage and historical identity across the country. International assets are those recognized for their global value and are integrated into UNESCO's lists, acknowledging their universal significance and contribution to the world's cultural and natural heritage.

Technologies and tools refer to the underlying frameworks and methodologies of the gamification or experience, including Virtual Reality, Augmented Reality, Artificial Intelligence, analogue supports, geolocation, and interactive tools. Equipment pertains to the devices utilized, such as mobile phones, computers, tablets, wearables, and paper.

The assessment encompassed several components. Community involvement was characterized as requiring more than mere consultation; it necessitates active participation from local non-governmental stakeholders, including associations, groups, entrepreneurs, and individuals, in the decision-making process. Descriptions examined the practices in detail, including their location and timing. The gamification process description covered aspects such as meaning, design, rules, elements, mechanics, and dynamics.

¹² *Convention Concerning the Protection of the World Cultural and Natural Heritage...*, 2.

Selected Case Studies

Building on the analyses outlined previously, this chapter will explore the 14 exemplary case studies detailed in the Best Practice Identification Criteria Excel file. These case studies represent the most effective practices identified through our evaluation process and will be examined to highlight their key features and insights.

BULGARIA

D. A. Tsenov Academy of Economics

*Asen Bozhikov, Dimcho Shopov, Dimitar Kostov, Dragomir Iliev,
Elitsa Krasteva, Elitsa Petkova, Evelina Parashkevova,
Iskra Panteleeva, Lyubomira Todorova, Mariela Stoyanova,
Margarita Bogdanova, Tsvetan Pavlov, Valentina Ninova, Zhelyo Zhelev*

The team from D. A. Tsenov Academy of Economics evaluated 16 heritage gamification reflecting the rich and diverse heritage of the country. Ultimately, they selected "Belogradchik Highlights: A High Wizard's Legacy" (with an aggregate score of 75.71 out of 100) and "Roman Plovdiv - Urban Game" (which received a score of 70.24) as best practices.

Belogradchik Highlights: A High Wizard's Legacy



Illustration 1.1: Belogradchik Rocks and Fortress

Source: <https://questoapp.com/experiences/belogradchik-outdoor-escape-games/belogradchik-highlights-a-high-wizard-s-legacy>

The gamification features ten historical sites in Belogradchik, including the Fortress of Belogradchik, the Church of St. George the Victorious, and the Astronomical Observatory of Belogradchik, covering 2.9 km walking distance. It is a real-life city exploration gamification with the following objectives: visiting Belogradchik's most iconic locations, meeting Bulgarian war heroes from various historical periods, exploring Bulgaria's naïve and intuitive art scene, admiring the unique local Balkan architecture, and visiting a mosque from 1751 to hear its tale of tragic romance.

The gamification meets the criteria for desirability by being developed in a low-density area and involving the community in its design, development, and aftermath. Available as an app on Questo for smartphones and tablets, the main rule is that every player must be physically present at the specified locations. Players with the highest scores are awarded medals on a leaderboard, specifically gold, silver, and bronze.

In terms of gamification criteria, the gamification received maximum scores for Purpose and Meaning, Completeness and Mastery, Relatedness, Loss Avoidance, Feedback, and Unpredictability. It scored, on the other hand, zero points in Change and Disruption, and one point in Challenge and Competence, Autonomy and Creativity, and Scarcity, with the two evaluators in full agreement in these areas. Regarding the impact criteria, the evaluators also agreed that the gamification is an excellent practice in nearly all sub criteria (5 out of 5), with very good scores (4 out of 5) in Accessibility and Enhancement of Local Culture. Therefore, this gamification excels in its design and impact, making it a standout example of effective gamification in cultural heritage.

Link to the gamification initiative:

<https://questoapp.com/experiences/belogradchik-outdoor-escape-games/belogradchik-highlights-a-high-wizard-s-legacy>

Roman Plovdiv - Urban Game

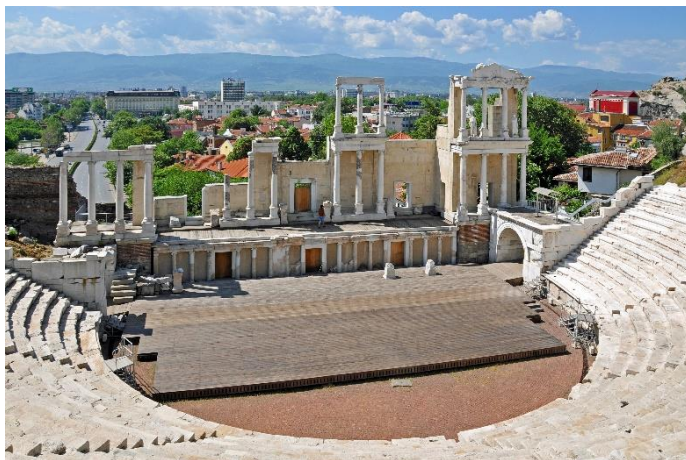


Illustration 1.2: Theatrum Trimontense (Roman theatre of Philippopolis) of Plovdiv

The gamification encompasses various tangible cultural and historic sites throughout the ancient city of Philippopolis (modern-day Plovdiv), which was the European Capital of Culture in 1999 and 2019¹³. The game spans a distance of 2.5 km and takes approximately two hours to complete. Its primary goal is to promote the history and culture of Plovdiv. The city benefited from European funding to create its digital heritage identity through projects such as "Digital Cultural and Historical Heritage of Plovdiv Municipality," which involved the digitization of numerous cultural properties.¹⁴

¹³ European Capital of Culture, *Plovdiv 2019*, <https://plovdiv2019.eu/en> (accessed July 15th, 2024).

¹⁴ Council of Europe, *Digital Cultural and Historical Heritage of Plovdiv Municipality*, <https://www.coe.int/en/web/culture-and-heritage/-/digital-cultural-and-historical-heritage-of-plovdiv-municipality> (accessed July 15th, 2024).

Although not located in a low-density area, the gamification offers significant community involvement in its design, development, and aftermath. Technically, the gamification utilizes geolocation and QR codes and is designed for smartphones and tablets. To play the game, participants need a smartphone, tablet, pen, and paper.

In terms of its ability to meet the scopes of the gamification criteria, it received maximum points in two subcriteria: Autonomy and Creativity, and Change and Disruption (the only evaluated gamification to achieve this performance). It also scored very well in Immersion, Ownership and Rewards, and Unpredictability. However, it was not considered a good practice in areas such as Scarcity (0 points) and Challenge and Competence (2 points).

As in the previous example, the gamification performed better in the Impact criteria, earning maximum points in Effectiveness and Innovation and Creativity. Its lowest scores were in Enhancement of Local Culture (1 point) and Social Development (2 points).

Link to the gamification initiative:

<https://vutreshenglas.com/roman-plovdiv>

CZECHIA

University of South Bohemia

Vojtěch Blažek, Petra Karvánková, Jiří Rypl

The University of South Bohemia in České Budějovice selected two exemplary cases of good practices related to the local heritage of the Cold War/Iron Curtain: Grafenried-Lučina and Živé Hory. These cases reflect both tangible heritage (building remains and landscapes) and intangible heritage (stories and beliefs of displaced people). These initiatives reflect a historical phenomenon from the end of the Second World War (1945-1948), specifically the expulsion of German Czechs, as well as Germans from Poland, with the support of the Allies as an act of vengeance for the Nazi occupation of these countries during the war. The Czech-German declaration of January 1997, in which each state "deplored" the suffering inflicted upon the other during and after the war, marked a significant step in reconciliation.¹⁵ However, grassroots initiatives often produce more tangible consequences for the communities and help in healing a painful past.

The two gamification initiatives are selected from low-density territories and fulfill the criteria for community engagement in both project design as well as in development and the aftermath. Grafenried-Lučina received a composite score of 86.90 out of 100, while Živé Hory scored 78.81.

¹⁵ R. M. Douglas, *Orderly and Humane: The Expulsion of the Germans after the Second World War* (New Haven: Yale University Press, 2014), 357.

Grafenried-Lučina



Illustration 2.1: Grafenried-Lučina, a heritage village of displaced German Czechs.

The gamification is dedicated to commemorating the displaced German Czechs after World War II and restoring the village destroyed during the construction of the Iron Curtain. Community involvement is fostered through the development of cross-border cooperation, with unions of municipalities on both the Czech and German sides jointly advocating for the renewal of the municipality and the preservation of the shared memory. The technology used in the gamification includes Web platforms, YouTube videos, guesting, and storytelling.

The gamification criteria are well addressed by this initiative, with both evaluators agreeing on the maximum score for Purpose and Meaning, Ownership and Rewards, and Loss Avoidance. At least one evaluator gave a score of 5 for Completeness and Mastery,

Immersion, and Unpredictability. The initiative received only 1 point in two criteria, Scarcity and Change and Disruption, which, as noted from the cases in Bulgaria, is seldom fulfilled by gamification initiatives. In three criteria—Challenge and Competence, Autonomy and Creativity, and Relatedness—the initiative received average scores.

In the impact criteria, the gamification is considered outstanding, receiving maximum points on all sub criteria except one (Accessibility), where one evaluator gave a score of 4. Therefore, in terms of impact, this gamification can be considered, along with the next one, as we shall see, an excellent example of best practice.

Link to the gamification initiative:

<https://www.svazekdomazlicko.cz/projekty-1/grafenried-lucina/>

Živé Hory



Illustration 2.2: Živé Hory Heritage Gamification

As in the case described above, the main objective of the gamification is commemoration of displaced German Czechs after the Second World War and restoration of the remains of the vanished village and their preservation. The development of cross-border cooperation, unions of municipalities on the Czech and German sides are jointly advocating for the renewal of the municipality and the preservation of the common memory. The technology of this game includes iOS + Android App, Web, and YouTube video.

In respect to the gamification criteria, the game was evaluated by the two evaluators as excellent in Purpose and Meaning, Ownership and Rewards, and Feedback, with at least one evaluator scoring a 5 for Completeness and Mastery, Immersion, and Unpredictability. Scarcity and Change and Disruption were

again perceived as the least developed areas of gamification, each receiving a score of only 1. As mentioned earlier, in the impact criteria, the gamification performed excellently, receiving maximum points on all subcriteria except one (Accessibility), where one evaluator gave a score of 4. The raters were in agreement in both main criteria in an average of 80% of the evaluations.

Link to the gamification initiative: <https://zivehory.cz/app/>

ITALY

University of Camerino

Renato de Leone

Italy is one of the richest country globally in terms of heritage sites covering all human history from prehistory to 20th century. The Italian team evaluated six gamification initiatives reflecting on this rich history. In the end, two of them were selected as good practices, Father and Son 2

Naples: Father and Son 2



Illustration 3.1: Father and Son 2 Gamification.

Source:

<https://play.google.com/store/apps/details?id=com.TuoMuseo.FatherAndSon2&hl=en>

The National Archaeological Museum of Naples (Museo Archeologico Nazionale di Napoli), established in stages since the 18th century, boasts vast collections of Egyptian, Greek, and Roman artifacts, including those from Pompeii. The museum also features extensive collections of epigraphy, mosaics, frescoes, and the

renowned Farnese collection started by Alexander Farnese, who became Pope Paul III in 1534.

The gamification "Father and Son" (Editions 1 and 2) introduces a novel approach to storytelling, highlighting the museum's history and its collections. Player choices influence the gamification's final outcome, with the narrative spanning various historical eras—from ancient Rome and Egypt, through the Bourbon era, to contemporary Naples. The gamification is produced by "TuoMuseo", an international company of artists, game designers, developers, sound designers and 3D animators working in partnership with the museum, and has been downloaded over 5 million times worldwide, with a geographically diverse user base.

The two evaluators highlighted as positive areas such as Purpose and Meaning, Autonomy and Creativity, and Immersion and Feedback, while attributing 0 points to Relatedness, Ownership and Rewards, and Scarcity and Loss Avoidance. Regarding Impact criteria, the gamification scored very well to excellent in Effectiveness, Accessibility, Inclusion, Enhancement of Local Culture, and Multiplier Effects, with average points in Sustainability, Innovation and Creativity, and Social Development.

Link to the gamification initiative:

<https://play.google.com/store/apps/details?id=com.TuoMuseo.FatherAndSon2&pli=1>

Humbria²O in Gioco



Illustration 3.2: Humbria²O in Gioco Heritage Gamification

Source: <https://www.humbria2o.it/album/>

Humbria²O in Gioco is an innovative card-collecting gamification that offers players an engaging journey into the rich and vibrant history of the Umbria region. Designed to immerse players in the legends, myths, and historical narratives of the area, the game brings to life the legendary Gods and Heroes from local folklore. Backed by the Umbria Region, this educational initiative is deeply rooted in community participation, uniting eight municipalities and 14 museums across the region. Targeted at students aged 10-13, the gamification provides a unique educational experience by encouraging young learners to explore and connect with their cultural heritage in an interactive way. As they progress, players collect and curate their own deck of historical and mythical figures, deepening their understanding of the stories that have shaped Umbria. This project not only fosters a love for history but also strengthens the bond between the region's youth and their cultural identity.

With regard to the Gamification criteria, Purpose and Meaning, Challenge and Competence, Completeness and Mastery and Feedback received the maximum points, with the Change and Disruption, and Unpredictability receiving none or under average. In Impact the gamification was particularly excelling in Effectiveness, Accessibility, Social Development and Enhancement of Local Culture, with the other criteria scoring between average and very well.

Link to the gamification initiative:

<https://www.humbria2o.it/album/>

PORTUGAL

Polytechnic University of Tomar

*Célio Gonalo Marques, Inês Araujo, Lgia Mateus, nia Chasqueira,
Hlder Pestana, Inês Serrano, Joo Tomaz Simes*

The Portuguese team analysed and compared ten gamification initiatives related to natural, tangible, and intangible heritage at local, regional, and national levels. Half of these initiatives were situated in low-density areas, with four involving community participation in the project design and nine in the project development and aftermath. The aggregate scores ranged from 30 to 68.81. Ultimately, two initiatives were identified as best practices: Lagoa Geotour and *Aldeia Pintada* (Painted Village), which will be discussed further below.

Lagoa Geotour



Illustration 4.1: Lagoa Geotour Gamification

Source: <https://lagoa-acores.pt/menu/descobrir-visitara/fazer/geotour>

Lagoa GeoTour is a collection of geocaches, placed on several points of interest of Lagoa municipality, at São Miguel, Azores archipelago. The tour was developed by a group of the scholar community of Lagoa High School in association with Lagoa Municipality and encompassed natural, tangible, and intangible heritage.

Lagoa is characterized by its exceptional landscape and rich cultural and historical heritage, which are reflected in its architectural, religious, and civil buildings, museums, public gardens, and natural reserves. The strong connection between the people of Lagoa and the sea is evident in the bustling fishing ports, with a clear focus on scientific and technological development for the future.

Lagoa GeoTour intends to immerse participants in the diverse contrasts of Lagoa territory: between past and future, sea and land, traditional and modern, allowing them to truly experience and feel Lagoa. The community played a significant role in creating the geocaches, remains actively involved in their preservation, and some caches even depend on the community for their implementation. The project, designed for mobile devices, utilizes geolocation and QR codes for an interactive experience. Although not classified as a gamification initiative by its creators, this project has the characteristics of a gamification initiative and has been considered as such. In Portugal, this is the only active geotour on the official geocaching.com website.

In the gamification criteria, the scoring of the project received maximum points from both scorers in two areas: Relatedness, and Ownership and Rewards. It also achieved very good scores in Purpose and Meaning, Challenge and Competence, and Autonomy and Creativity. However, the initiative was considered weaker in areas such as Scarcity, Loss Avoidance, and Feedback, and a null

score in Change and Disruption, as much as most of the cases above mention.

The evaluation on impact criteria showed that the project is a good practice in many areas. It received maximum points in Effectiveness and Enhancement of Local Culture, and very good scores in Sustainability, Inclusion, Originality, and Creativity. The two scorers did not identify any weak points, noting only average performance in two criteria.

Link to the gamification initiative:

<https://www.geocaching.com/play/geotours/lagoa-azores>

Aldeia Pintada (Painted Village)



Illustration 4.2: Heritage Site in Aldeia Pintada, Torre, Batalha

‘Aldeia Pintada’ project is established in Torre village located at ‘centro region’, in Portugal mainland. The initiative is based on local sayings and expressions, songs, stories, and village legends and tales and includes elements of tangible and intangible heritage. The main objective is to document and to record local heritage and use it as a stimulus for artistic creation and experience, as well as a tourist attraction that values local memory and identity. The community is involved in the project, taking part in the process of creating the paintings and the project's interactive content. The project is constantly developing, with the creation of new paintings and new interactive content. The initiative uses a digital map with geo-location, created on Google Maps, and QR codes, to guide visitors to key points of interest and showcase the artistic installations throughout the village.

In this case, the two scorers agreed that this gamification initiative excelled in Immersion and demonstrated very good traits in Autonomy and Creativity, Ownership and Rewards, and Unpredictability. Unusually, it also scored very well in Change and Disruption. However, its lowest aspects were Completeness and Mastery, Scarcity, Loss Avoidance, and Feedback, where it was considered a bad practice.

The gamification initiative was praised by the evaluators in most of the impact criteria. It received maximum points in Effectiveness, Sustainability, Originality, Creativity, and Enhancement of Local Culture, with only two criteria where it was considered average.

Useful links to the gamification initiative:

https://goo.gl/maps/GYbQznUBGtuhVZNu7?g_st=ac

<https://www.youtube.com/@olugarinhodatorre5688> and

<https://www.instagram.com/aldeiapintada/>

ROMANIA

Valahia University of Targoviste

Silviu Miloiu, Sergiu Musteață, Paul Bogdan Sălișteanu

In Romania, two out of five gamification initiatives were recognized as good practices. The first is a village in Transylvania that impressively upholds its local, regional, and national heritage and boosts its identity. It is notably the birthplace of the renowned philosopher Emil Cioran, whose house is preserved intact and attracts visitors from around the world, adding international value to the village's cultural significance. The village is also the birthplace of a former prime minister and nationalist poet, attracting many visitors from across Romania. A local museum narrates the village's rich history. Attested in 1204, it is considered the oldest in Transylvania and boasts impressive ethnofolkloric value, showcasing the traditions and tales of the Sibiu region (Mărginimea Sibiului). The village is also a significant gateway to numerous mountain trails that lead tourists to the Cindrel Mountains, with its highest peak reaching 2,244 meters.¹⁶ The second one is related to local cultural heritage, and how it is affected by climate change, and is designed especially for high school teenagers.

¹⁶ Raluca Iliuț, "Rășinari, trasee ale etno și ecoturismului," *Cibinium II* (2006-2008): 145-155.

Rasinari



Illustration 5.1: Rasinari Gamification, The memorial plaque to honor the memory of Emil Cioran

The Questo gamification is focused on the Art, History, Culture, and Stories of the historic village of Rasinari. Its main objectives are to educate players about the historical and cultural significance of various memorial houses, historical churches, and art pieces; to raise awareness about the value of intangible heritage, such as traditional stories and folk traditions, and their role in preserving cultural identity. The game encourages players to engage in activities that simulate the preservation and conservation of

historical sites and artifacts and highlight the importance of safeguarding intangible cultural heritage through in-game missions and storytelling. Ileana Carmen Damean, the gamification creator posted on Questo, is a mathematics and computer science teacher at Barcianu School in Rasinari. She co-leads the GreenIMPACT "Cocoșul de Munte" club in Rasinari, Sibiu. The club, established in January 2018 with support from the Rășinari Town Hall and the „Noi Orizonturi” Foundation, operates within a secondary school. The club's mission has been to promote local heritage in an ecotourism area. The gamification is for mobile devices able for iOS + Android App, Web, YouTube, and Storytelling. The gamification guides participants on a 1.8 km tour, which takes just under two hours to complete.

In terms of gamification criteria, the game excelled in Purpose and Meaning, Challenge and Competence, Completeness and Mastery, and Scarcity. However, it was considered a bad practice in Change and Disruption. Among the impact criteria, the gamification scored exceptionally well in Effectiveness, Accessibility, Inclusion, and Enhancement of Local Culture, with other areas ranging from average to very good. The interrater agreement was notably high at 90%.

Link to the gamification initiative:

<https://questoapp.com/experiences/ra-inari-walking-tours/deschide-portile-spre-legende-rasinarene>

Climate Change



Illustration 5.2: Climate Change Gamification

This is an educational gamification for secondary-level students aged 13 to 18, which helps students discover their local cultural heritage, and how it is affected by climate change and engages them through the free Climate Heritage Game. The gamification encourages students to learn about their local heritage through short videos and interesting, fun questions. In the end, the game offers the opportunity to test acquired knowledge in challenging quizzes. So, in one way the game includes some local study cases, in another way it encourages students from various locations to learn about these places. At the same time, the game can be expanded by creating content and sharing the wonders of other historical locations. Thus, students in various localities are encouraged to contribute to the protection of endangered monuments by raising awareness.

The gamification has the following objectives: Promote the value of European cultural heritage; Train teachers on how to create a digital game for educational purposes; Raise awareness about the climate crisis and Connect students to their communities and local

history. The gamification is for computer and mobile devices with Internet access to the webpage.

Regarding gamification criteria, the game is recognized as a best practice in Immersion and Scarcity, and it scored very well in eight other criteria. In terms of impact, the gamification ranged from very good to excellent, with particular praise from raters for Accessibility, Inclusion, and Creativity.

Link to the gamification initiative:

<https://climateheritage.eu/>

SLOVAKIA

Trnava University in Trnava

Lucia Nováková, Zuzana Danišková

The Slovakian team evaluated six gamification initiatives focused on local and regional heritage, with three of these located in low-density areas. Two initiatives demonstrated community involvement throughout the project design, development, and aftermath. The highest scores were achieved by the games *Golden Ticket Hunt* (90.95 out of 100) and *City QR Game in Handlová* (82.38%).

Golden Ticket Hunt



Illustration 6.1: Golden Ticket Hunt Game

The gamification draws inspiration from Roald Dahl's literary heritage, focusing on the exploration of intangible heritage. Conceived by a group of enthusiasts from various cultural institutions around Panenská Street in Bratislava, the project is designed to celebrate the month of books in a unique and engaging

way. By integrating elements from a beloved literary work, the gamification provides an original format that connects various stakeholders who also collaborate on other initiatives. Participants are encouraged to engage actively by searching for hidden golden tickets in books and promotional materials at designated locations. This interactive element fosters a sense of discovery and excitement. The game also leverages social media, allowing participants to share their findings and experiences, thereby strengthening community bonds and enhancing the collective experience.

Accessible via mobile devices equipped with QR code readers, the game requires the installation of a dedicated application. This technology facilitates an immersive experience, seamlessly blending the literary inspiration with tangible and intangible heritage exploration.

When evaluated based on gamification criteria, the game received excellent scores in Purpose and Meaning, Immersion, all Extrinsic Motivation Heuristics, and Context-Dependent Heuristics. A few criteria were considered to be fulfilled very well. In terms of impact, the game performed notably in Accessibility and Inclusion, Originality, and Multiplier Effects, with other criteria being addressed very well. Overall, the game is considered to be a strong example of best practices in gamification.

City QR Game in Handlová



Illustration 6.2: City QR Game in Handlová

The goal of the gamification is to explore the rich local history of Handlová, a town with medieval roots, encompassing both tangible and intangible heritage. Developed as part of the participatory budget project PARTI, the gamification involved significant contributions from the Children's Organization FÉNIX. This organization was one of five Slovak groups that received training on project development, with its young members actively participating in the gamification 's creation. Designed for mobile devices, the game features a QR code reader and requires application installation for a fully interactive experience.

Although this game received comparatively lower scores in gamification criteria compared to the previous one, it is still recognized as an excellent example of best practices in several areas. It excelled in Purpose and Meaning, Immersion, Ownership and Rewards, Feedback, Unpredictability, and Change and Disruption. However, it achieved only average scores in Challenge

and Competence, as well as Scarcity and Loss Avoidance. The gamification excelled in the Impact criteria, achieving top scores in all Performance, Accessibility, and Inclusion aspects. However, it received 0 points in Multiplier Effects and scored average to high in the remaining criteria.

Link to the gamification initiative:

<https://www.handlova.sk/novinka/84937/zabavte-sa-s-novou-mestskou-qr-hrou>

TÜRKİYE

Adana Science and Technology University

Samet Oran, Muhammet Aktaş

Türkiye, a bridge between Europe and Asia, boasts a rich cultural heritage that makes it a prominent global tourist destination. The team at Adana Science and Technology University concentrated on gamification projects that reflect both Turkish and Iranian heritage, encompassing tangible and intangible aspects of local, national, and international significance. Three of the games were implemented in low-density areas, with community involvement in the development and aftermath of two of them. The highest scores were awarded to a gamification highlighting the local history of Antalya Alarhan (95.24 out of 100) and another focusing on Iran (88.33), both recognized as exemplary practices.

Antalya Alarhan

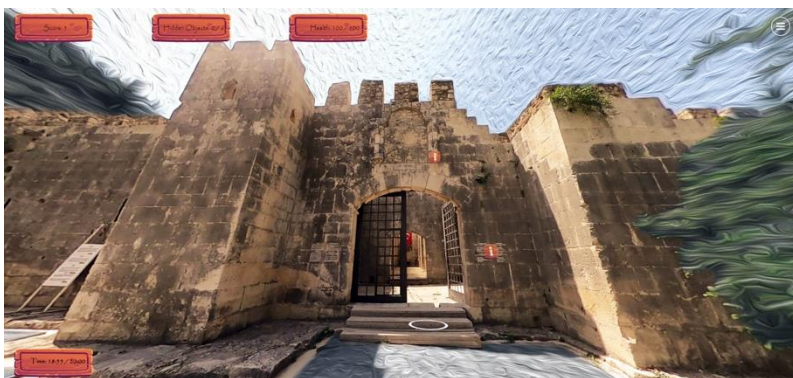


Illustration 7.1: Antalya Alarhan Game

The gamification is designed to explore the local history of Antalya Alarhan, with a focus on its intangible heritage. It serves both educational and recreational purposes and is available for mobile devices with web access. The gamification features interactive elements such as sound effects and illustrations, incorporates storytelling, and includes hidden clues within the narrative to enhance the learning experience.

When analyzed according to gamification criteria, the game achieved maximum points in all sub-criteria except for Change and Disruption, which received 3 points. Similarly, in terms of impact, it scored top points across most criteria, though it received medium to high scores for Enhancement of Local Culture and Multiplier Effects. Therefore, the game shall be regarded as an excellent gamification initiative.

Link to the gamification initiative:

https://vaezafshar.com/Games/khan_game

The Sericum Via a Serious Game for Preserving Tangible and Intangible Heritage of Iran



The city of Neyshabur in the northwestern part of Iran is not just famous for the poet Omar Khayyam, but also for the purity of its turquoise. Just outside this town are mines from which this precious stone is extracted, then shaved and shaped in to pendants, rings, and other jewelry. Turquoise is also used in art forms such as *firoozeh koob*, the art of hammering small pieces of turquoise into copper. In Persian culture, turquoise is said to have healing properties, detoxify the body, and protect against the evil eye. Shades of blue are omnipresent in Iranian mosques and palaces, and turquoise is a way to take it back home.

[Continue](#)

Illustration 7.2: The Sericum Via Game

The gamification centers on intangible heritage, offering players an immersive exploration of the Silk Road's historical significance in Iran. It has to be recalled that as part of UNESCO's Silk Road Programme, a branch of the Silk Road traverses the western and southern edges of Iran's central desert, connecting a series of historic cities, including Kashan, Nain, Yazd, and Kerman, on its route to India.¹⁷ It is designed with both educational and recreational objectives in mind. Accessible via mobile devices with web access, the gamification provides an engaging way to learn about this important historical trade route.¹⁸

When evaluated against gamification criteria, the gamification excels in seven sub-criteria: Purpose and Meaning, Challenge and Competence, Completeness and Mastery, Relatedness, Immersion, Ownership and Rewards, and Unpredictability. It is assessed as average or lower only in Autonomy, Creativity, and Change and Disruption. In terms of impact, the gamification shines in five criteria: Sustainability, Accessibility, Inclusion, Creativity, and Social Development, with average scores in Enhancement of Local Culture and Multiplier Effects.

Link to the gamification initiative:

https://vaezafshar.com/Games/Sericum_Via.html

¹⁷ UNESCO, Silk Roads Programme, *Yazd*, <https://en.unesco.org/silkroad/content/yazd> (accessed July 22, 2024).

¹⁸ More on the game at "THE SERICUM VIA: A Serious Game for Preserving Tangible and Intangible Heritage of Iran," 9th International Conference of the Arab Society for Computer-Aided Architectural Design: Architecture in the Age of Disruptive Technologies, vol. 1 (Cairo: ASCAAD 2021): 307-316.

Discussion of Results and Future Actions

Fifty heritage initiatives from seven countries were analyzed by seven teams during the spring and early summer of 2024. As mentioned in the introduction, the goal was to select the 14 best practices, with each team choosing two top initiatives from their respective countries or abroad. The selected case studies from the seven countries provide valuable insights into the effectiveness and areas for improvement in gamified cultural heritage projects. By comparing the results, we identified common strengths and weaknesses, as well as unique characteristics that contribute to the success of these initiatives.

Most of the selected heritage initiatives encompass tangible and intangible aspects of heritage, including elements of natural heritage. While the focus is predominantly on local or regional heritage, there are also instances of national and international heritage being addressed. Typically, these initiatives engage with local heritage through the promotion of buildings, storytelling, or a combination of both, often with aims that include community engagement, educational purposes, and preservation.

Community involvement is a significant aspect of these projects, with 12 out of the 14 initiatives incorporating community input into their design, and all but one including it in the development and aftermath stages. Notably, eight of the selected initiatives are located in low-density areas, highlighting their relevance to projects aimed at revitalizing or preserving heritage in less populated regions.

The technologies utilized by the 14 games showcase a diverse and innovative approach to engaging players and enriching their experiences. Geolocation appears as a prominent technology, used in various combinations to create interactive and location-based gameplay. It is paired with QR codes in some games to

enhance the interactive element, allowing players to unlock content or solve puzzles by scanning codes at specific locations. Mobile apps are another common technology, often combined with other tools like geolocation, QR codes, or storytelling, to provide a comprehensive platform for gameplay and narrative immersion. Storytelling is a recurring element, frequently integrated with web-based platforms, mobile apps, and social media to weave narratives and engage players in a more dynamic manner. The use of web pages and social media suggests an emphasis on accessibility and community engagement, often involving hidden clues or interactive content that encourages exploration and collaboration. YouTube is also utilized, primarily for supplementary content or promotional purposes, enhancing the overall experience with visual storytelling.

The equipment utilized across the 14 games reveals a focus on mobile and portable devices as the primary tools for engagement. Smartphones and tablets are the most commonly used equipment, reflecting their versatility and widespread accessibility for players. These devices are employed for various interactive elements, including geolocation, QR code scanning, and mobile applications, which facilitate dynamic and location-based gameplay. Pen and paper are also used in some games, often in conjunction with mobile devices, suggesting a blend of traditional and digital methods to enhance the gaming experience. This combination allows players to engage in physical note-taking or puzzle-solving alongside digital interactions. Books, promotional materials, and golden tickets indicate that some games incorporate physical items as part of their gameplay or promotional strategies. These materials often serve as supplementary tools or rewards that enrich the gaming experience and provide tangible elements for players to interact with.

TABLE 1
RESULTS OF GAMIFICATION SCORING OF THE SELECTED 14 BEST PRACTICES

PROJECT CODE	Project name	Intrinsic Motivation Heuristics						Extrinsic Motivation Heuristics			Context Dependent Heuristics		
		Purpose and Meaning	Challenge and Competence	Completeness and Mastery	Autonomy and Creativity	Relatedness	Immersion	Ownership and Rewards	Scarcity	Loss Avoidance	Feedback	Unpredictability	Change and Disruption
BG-007	Belogradchik Highlights: A High Wizard's Legacy	5	1	5	1	5	4	4	1	5	5	5	0
BG-014	Roman Plovdiv - Urban game	4	2	3	5	4	3	4	0	3	3	4	5
CZ-001	Grafenried-Lučina	5	3	4.5	3	3	4.5	5	1	5	4	4.5	1
CZ-002	Živé Hory	5	3	4.5	3	3	4.5	5	1	5	4	4.5	1
IT-001	Naples: Father and Son 2	4	3	3	4	0	3.5	0	0	0	5	2	1
IT-002	Humbria ² O	5	5	5	4	1.5	4	4	4	3	5	2	0
PT-003	Lagoa Geotour	4	4	4	3	5	2.5	5	1	1	0.5	3.5	0
PT-006	Aldeia Pintada (Painted Village)	2	2	0	4.5	3	5	4	0	0	0	4	4

RO-001	Rasinari	5	5	5	3	4	4	3	5	4	4	4	0
RO-002	Climate Change	4	4	4	4	4	5	4	5	4	4	4	2.5
SK-001	Golden Ticket Hunt	5	4	4	4	4	5	5	5	5	5	5	4
SK-004	City QR Game in Handlová	5	3	4	4	4.5	5	5	3	3	5	5	5
TR-001	The Anatolian Journey Along the Silk Road	5	5	5	5	5	5	5	5	4.5	5	5	3
TR-003	The Sericum Via A Serious Game For Preserving Tangible And Intangible Heritage Of Iran	5	5	5	3.5	5	5	5	4.5	4	4	5	2.5

To compare the performance of the 14 gamification cases across the specified criteria, we will summarize the strengths and weaknesses for each criterion and identify the top-performing and underperforming cases.

First, we calculated the average score for each criterion across all Gamification criteria:

- Purpose and Meaning: 4.5
- Challenge and Competence: 3.5
- Completeness and Mastery: 4
- Autonomy and Creativity: 3.64
- Relatedness: 3.64
- Immersion: 4.29
- Ownership and Rewards: 4.14
- Scarcity: 2.54
- Loss Avoidance: 3.32
- Feedback: 3.82
- Unpredictability: 4.11
- Change and Disruption: 2.07

Analyzing these practices in more detail, we see varied performance across different criteria. In Purpose and Meaning, the top performers were High Wizard's Legacy, Grafenried, Živé Hory, MED GAIMS, Rasinari, Golden Ticket, City QR Game, Anatolian Journey, and Sericum Via (all scored 5). The only underperformer was Painted Village. For the Challenge and Competence criterion, top performers included MED GAIMS, Rasinari, Anatolian Journey, and Sericum Via (all scored 5). The underperformers were High Wizard's Legacy (1), Urban Game (2), and Painted Village (2). In the Completeness and Mastery category, top performers were High Wizard's Legacy, MED GAIMS, Rasinari, Anatolian Journey, and Sericum Via (all scored 5). Underperformers included Painted Village (0), Father and Son (3), and Urban Game (3). Regarding Autonomy and Creativity, the top performers were MED GAIMS,

Golden Ticket, and Anatolian Journey (all scored 4 or higher). The underperformer was High Wizard's Legacy (1). In Relatedness, the top performers were Anatolian Journey, Sericum Via, Climate Change, and Urban Game (all scored 5). The underperformers were Father and Son and Geotour (0). For the Immersion criterion, Grafenried, Živé Hory, Rasinari, Golden Ticket, City QR Game, Anatolian Journey, and Sericum Via scored the highest (all scored 5). The underperformers were Geotour (2.5).

When evaluating the three Extrinsic Motivation Heuristics, we find that in Ownership and Rewards, the cases of Grafenried, Živé Hory, Geotour, Golden Ticket, City QR Game, Anatolian Journey, and Sericum Via exhibited excellence, while Father and Son underperformed with 0 points. For the Scarcity criterion, top performers included Rasinari, Climate Change, Golden Ticket, and Anatolian Journey (all scored maximum points). Conversely, Urban Game, Father and Son, and Painted Village received 0 points. In the Loss Avoidance category, top performers were High Wizard's Legacy, Grafenried, Živé Hory, and Golden Ticket (all scored 5 points). The underperformers were Father and Son and Painted Village, both receiving no points. Regarding the first of the three Context Dependent Heuristics, Feedback, the top performers with maximum points were High Wizard's Legacy, Father and Son, MED GAIMS, Golden Ticket, City QR Game, and Anatolian Journey, with Geotour and Painted Village receiving almost no points. For Unpredictability, the top-ranked were High Wizard's Legacy, Golden Ticket, City QR Game, Anatolian Journey, and Sericum Via (all scored 5 points), while Father and Son and MED GAIMS scored only 2 points. In the final criterion, Change and Disruption, which was not well addressed by the 14 games, only Urban Game and City QR Game scored excellently, with Painted Village and Golden Ticket considered very good. However, seven games, including High Wizard's Legacy, Grafenried, Živé Hory, Father and Son, MED GAIMS, Geotour, and Sericum Via, scored 0 or 1.

The analysis of the 14 gamification cases reveals several key insights. Strong performance in Purpose and Meaning, Ownership and Rewards, Unpredictability, and Completeness and Mastery indicates the importance of clear objectives, meaningful rewards, and engaging narratives. Future gamification initiatives should incorporate these elements to enhance player engagement. Feedback, Autonomy and Creativity, Relatedness, Challenge and Competence, and Loss Avoidance were above average, suggesting that regular feedback, opportunities for creativity, fostering social connections, balanced challenges, and the fear of loss are also essential components. However, the low scores in Scarcity and Change and Disruption highlight common weaknesses. Future initiatives should focus on introducing rare and valuable elements and dynamic, unpredictable changes to maintain player interest. By leveraging these insights, new gamification projects can improve their effectiveness and player engagement.

TABLE 2
RESULTS OF IMPACT SCORING OF THE SELECTED 14 BEST PRACTICES

PROJ CT CODE	Project name	Performance		Accessibility and Inclusion		Innovation and Creativity		Social and Cultural Impact		
		Effectiveness	Sustainability	Accessibility	Inclusion	Originality	Creativity	Social Development	Enhancement of Local Culture	Multiplier effects
BG-007	Belogradchik Highlights: A High Wizard's Legacy	5	3	4	3	5	5	2	1	3
BG-014	Roman Plovdiv - Urban game	5	5	4	5	5	5	5	4	5
CZ-001	Grafenried-Lučina	5	5	4.5	5	5	5	5	5	5
CZ-002	Živé Hory	5	5	4.5	5	5	5	5	5	5
IT-001	Naples: Father and Son 2	4	2.5	4	5	3	3	3	5	5
IT-002	Humbria ² O	5	4	5	4	3.5	3	5	5	3
PT-003	Lagoa Geotour	5	4	3	4	4	4.5	5	5	3
PT-006	Aldeia Pintada (Painted Village)	5	5	3	3	5	5	4	5	4
RO-001	Rasinari	5	4.5	5	5	4.5	4	4	5	4

RO-002	Climate Change	4	4	5	5	4	5	4	4.5	4
SK-001	Golden Ticket Hunt	4	4	5	5	5	4	4	4	5
SK-004	City QR Game in Handlová	5	5	5	5	3	5	4	4	0
TR-001	The Anatolian Journey Along the Silk Road	5	5	5	5	5	3.5	5	3	4.5
TR-003	The Sericum Via A Serious Game For Preserving Tangible And Intangible Heritage Of Iran	4	5	5	5	4	5	5	3.5	3

Table 3: Average scores on criteria

Criteria	Max Score	Mean Score (All Cases)
Effectiveness	5	4.71
Sustainability	5	4.36
Accessibility	5	4.43
Inclusion	5	4.57
Originality	5	4.36
Creativity	5	4.43
Social Development	5	4.29
Enhancement of Local Culture	5	4.21
Multiplier Effects	5	3.82

Overall, the evaluation of the gamification initiatives reveals strong overall performance across most criteria, though there is notable variation in multiplier effects. Most projects excel in effectiveness, with the majority receiving top scores, which indicates their success in engaging users and achieving objectives. However, sustainability shows a broader range of scores, suggesting that while many projects demonstrate strong long-term viability, improvements are needed in ensuring ongoing impact.

Accessibility and inclusion are generally well-addressed, with many projects scoring between 4 and 5. Nonetheless, some, like Lagoa Geotour and Aldeia Pintada, received average scores, highlighting areas for improvement. Inclusion scores are particularly high, reflecting a strong commitment to diverse audience integration, although a few projects, such as Belogradchik Highlights and Aldeia Pintada, performed at a more average level.

Regarding innovation and creativity, originality scores are mixed, with several projects achieving top marks, while others, including Naples: Father and Son 2 and City QR Game in Handlová, show less innovation. Creativity scores also vary, with many projects excelling, but some, like Naples: Father and Son 2 and The Anatolian Journey, have room for more inventive approaches.

In terms of social and cultural impact, projects generally perform well in social development, with many achieving maximum scores. However, there is room for improvement, as seen in projects like Belogradchik Highlights and Naples: Father and Son 2. For enhancing local culture, half of the projects received top scores, while others, such as Belogradchik Highlights and The Anatolian Journey, were rated average.

Finally, multiplier effects show significant variation, with five projects achieving full scores and others, including City QR Game in Handlová, scoring none. This variation underscores the need for greater consistency in maximizing the broader impact of gamification initiatives.

The analysis of fifty heritage initiatives across seven countries, distilled into 14 exemplary case studies, reveals a rich variety of strengths and areas for improvement in gamified cultural heritage projects. The majority of these initiatives demonstrate high performance in effectiveness, purpose, and meaning, with several projects excelling in ownership and rewards, unpredictability, and completeness. These findings underscore the importance of clear objectives, meaningful rewards, and engaging narratives in enhancing player engagement.

Notable strengths include the integration of diverse technologies such as geolocation, QR codes, and mobile apps, which collectively enhance user experience through interactive and location-based gameplay. The frequent use of storytelling across platforms also contributes to immersive and dynamic narratives. The equipment employed, predominantly mobile devices, reflects a modern approach to accessibility and engagement, while the combination of traditional elements like pen and paper with digital tools highlights an innovative blend of methods.

However, the analysis also reveals significant variability in certain criteria. While most projects score highly in accessibility and

inclusion, a few show average performance, indicating room for improvement in making these initiatives more universally accessible and inclusive. Similarly, scores in creativity and originality are mixed, with some projects demonstrating exceptional innovation and others lagging behind, suggesting that future projects could benefit from a greater emphasis on creative approaches.

The lower scores in scarcity and change and disruption point to common weaknesses in maintaining player interest through rare, valuable elements and dynamic changes. Addressing these areas could significantly enhance engagement and long-term player retention. The variation in multiplier effects also highlights a need for more consistent strategies to amplify the broader impact of gamification initiatives.

Some of the lessons learned and actions needed are as follows:

1. **Emphasize Clear Objectives and Rewards:** Future gamification projects should continue to prioritize clear goals and meaningful rewards, as these elements are crucial for effective engagement and user satisfaction. Ensuring that objectives are well-defined and rewards are perceived as valuable can drive higher levels of participation and impact.
2. **Enhance Creativity and Innovation:** While some projects are highly original, others show less innovation. Future initiatives should focus on fostering creativity and incorporating unique elements to stand out and provide fresh experiences. Embracing new technologies and storytelling methods can enhance originality and engagement.
3. **Address Accessibility and Inclusion:** Although many projects perform well in these areas, there is room for improvement. Ensuring that gamification initiatives are accessible to a diverse audience, including those with

varying needs and backgrounds, will enhance their effectiveness and reach.

4. **Incorporate Scarcity and Dynamic Changes:** To maintain player interest and engagement, future projects should introduce rare and valuable elements and incorporate dynamic, unpredictable changes. This can help keep the experience fresh and engaging over time.
5. **Improve Multiplier Effects:** Given the significant variation in multiplier effects, future initiatives should focus on strategies to maximize their broader impact. This includes developing approaches to enhance the reach and effectiveness of gamification beyond the immediate user experience.

By synthesizing these lessons, future gamified cultural heritage projects can be designed to better engage, educate, and resonate with communities and players, ensuring they are not only entertaining but also culturally enriching and impactful. Integrating these insights will lead to more successful and meaningful gamification initiatives in the cultural heritage sector.

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