

Storytelling and Gaming Tools for Easy Immersive Fruition of Intangible Heritage

Maria Teresa Artese¹[0000-0001-8453-0807], Isabella Gagliardi¹[0000-0002-3706-0993],
Mattia Fortunati²[0009-0001-3168-6151], Tiziana Pasciuto²[0000-0002-2440-2376]

¹ National Research Council, Institute of Applied Mathematics, and Information Technologies
“Enrico Magenes” (CNR-IMATI), 12, Alfonso Corti Str., 20133, Milan, Italy

² National Research Council, Institute of Applied Mathematics, and Information Technologies
“Enrico Magenes” (CNR-IMATI), 6, De Marini Str., 16149, Genoa, Italy
{teresa, isabella}@mi.imati.cnr.it,
{mattia.fortunati, tiziana.pasciuto}@ge.imati.cnr.it

Abstract. Transmission and preservation are key aspects of intangible heritage, so new communication strategies are crucial to reach a wider audience. The aim of this work is to apply digital storytelling tools and games to disseminate heritage and help people to discover it, by developing challenges and adventures based on the resources retrieved from Querylab's ICH Discovery section.

Keywords: Querylab Portal, Serious Games, Gamification, Immersive Fruition, Intangible Cultural Heritage.

1 Introduction

Intangible cultural heritage is an aspect that is still little known and widespread, the preservation of which relies precisely on the transmission and maintenance of the traditions and rituals that comprise it. In order to improve its communication, it is necessary to find easily accessible solutions and new communication strategies capable of attracting an increasingly wide and heterogeneous audience, which through discovery and sharing contributes to the dissemination of intangible content.

Digital storytelling and stories created by experts on cultural heritage can improve user experience and the use of game design elements in non-game contexts are able to motivate and increase users' attention. The key-term "gamification" is defined as "the process of making activities in non-game contexts more game-like by using game design elements" (Sailer, Hense, Mayr, & Mandl, 2017), (Deterding, Dixon, Khaled, & Nacke, 2011) and allows the introduction of elements such as points, badges, avatars, stories and so on, as well as the concepts of competition or progress and motivational power. It has been shown that games used for serious purposes, so-called serious games, promote human motivation and gratification (Sherry, Greenberg, Lucas, & Lachlan, 2012).

Another important concept to consider in creating digital storytelling is the “hero's journey”, first coined by Campbell in 1949 in his book “The hero with a thousand faces” (Campbell, 2008) where he outlined the hero's journey in three basic stages and seventeen detailed steps, essentially a hero travels from the everyday world into a region of supernatural wonders where he encounters fabulous forces and embarks on an adventure, is victorious in a decisive crisis, and returns home changed or transformed.

Here we present the design of storytelling tools embedded in the context of the portal, to enable the organization of retrieved resources using Querylab's built-in queries. The purpose is to generate immersive games in which the user is interactively guided to discover heritage, tangible and/or intangible, through challenges and adventures. The tool being designed is an interactive storytelling editor, a framework that allows experts in the field, researchers, and teachers to create interactive and customizable pathways and/or stories, designed for certain types of content and aimed at different types of users (seniors, tourists, students...). These paths allow, through the challenges and adventures in which users are involved, to learn about and discover cultural heritage, while also having a playful experience.

The article is organized as follows: the use case that is the subject of the prototype development is presented first, followed by how to approach the development of the test games with technical details and an example of the results obtained. All these features will become starting points for the definition of the story editor. Future work concludes the article.

2 Use Case for Storytelling Tools on Intangible Heritage

The use case for the experimentation of immersive fruition for ICH is the QueryLab portal (QueryLab Portal, 2023), a platform dedicated to querying several databases simultaneously in a user-friendly way. Used data are those related to intangible heritage and come from the QueryLab's IntangibleHeritage archive, created by collecting and indexing data from different intangible archives in the world. The data are gathered using a specific model, as described in (Artese & Gagliardi, 2022), called the ICH-Light Model, capable of storing and providing the minimum information needed to describe intangible assets and retrieve them from the original resources.

To date the IntangibleHeritage archive collects ICH assets from Asia Pacific Area (ACCU Data Bank), India (Sahapedia), Germany (Immaterielles Kulturerbe), Switzerland (Living Traditions in Switzerland) and Italy (IntangibleSearch). Recently we have also added the Unesco ICH List and the Register of Good Safeguarding Practises (Unesco ICH, 2023).

QueryLab integrates and queries this archive together with other platforms such as Europeana, the Victoria & Albert Museum, DPLA, Cooper-Hewitt and others using the REST-API services provided by the archives themselves.

To project the storytelling editor, we adopted a bottom-up strategy, starting from some resources retrieved by QueryLab “Carnival” themed route, we designed some test games useful and needed to define and set up the underlying data structure, constraints, basic components, and organization (Vrettakis, et al., 2020).

3 Immersive Fruition and Games

The QueryLab portal provides the environment to develop different exploration tools to simplify and lighten the search, usability as well as accessibility of intangible heritage resources and archives. Starting from the IntangibleHeritage archive and the thematic pathways developed, we intend to offer an alternative way of navigating through the information, focused on the user's ultimate enjoyment, based on interactivity, immersion, and storytelling. We have chosen gaming tools, and more precisely video games, as our main tool. Moving beyond classic archival visualizations, games allow us to showcase intangible heritage resources using a medium that has a greater impact due to its more dynamic components and its increasing cultural dissemination. Using the video component of videogames, we will show an animated representation of the macro-categories (carnival, traditional dance, singing, festive events etc.), in the form of a map, which by taking advantage of the interactivity of games allows the player to explore the resources by moving the avatar in the virtual world.

This will also exploit the player's motivations such as “control” and “autonomy”, making the experience more voluntary, free, and fun, thus more effective in terms of gamification and serious gaming. The user will be guided and oriented in this exploration: using the “goal oriented” and “challenge” components of the games, specific goals or missions can be set, driving the player to reach specific parts of the map (created using the assets stored in the archive) and to perform specific actions through the avatar, such as talking, touching, fetching, searching, etc. This allows the immersive aspect of video games to be fully exploited.

From a narrative point of view, to exploit a design to which the public is accustomed, we will follow a “hero's journey” design approach, simplified, and adapted to our purposes. Each objective offered to the player will be formulated as a journey, starting with an initial call to adventure (necessity), several trials to be performed in the virtual world (e.g., search, find, take) and a final return to the ordinary (reward, loop to a new objective). This will provide the gamer with playful motivation and guide the exploration of the intangible heritage materials. An important factor in this design concerns the interaction mechanics, i.e., all possible actions the player can perform on individual resources retrieved from the archive and presented in the game.

To make it as readable, accessible, and simple as possible, when meeting an object or place, a “wheel of the senses” widget appears on the screen, displaying an icon for each of the five senses (Sight, Sound, Smell, Taste and Touch). Through these buttons, the gamer can explore all the sensory information specific to that object or place, while also being able to access more detailed data through an external direct link to archive resources. This type of fruition through sensory information, however, will also require a specific classification for database entries, which will be managed through sensory tags.

3.1 Technical Approach

From a technical point of view, since the goal is reachability, accessibility, and simplicity, we decided to develop an HTML5, cross-platform web game application. This

means that the game will run on any browser, computer, and mobile phone, with a simple link, without the need to download or install anything. The game controls will also be very simple, so that the game can be played on smart TVs, and, for greater compatibility, our application will be 2d. Communication between the front-end (game) and the back end (database) will be handled with an API with which we will send a request and receive information in JSON format.

To begin with, we have imagined a game based on the carnivals of the world, based on QueryLab's "Carnival" results. The game shows a map of the world, with several points on it, each representing a different carnival. The player's avatar is a character piloting a hot air balloon that flies in the skies above the map (Fig. 1). The avatar can be moved by clicking/tapping and/or using arrows (like the arrows on the TV remote control). By clicking on a point on the map representing a carnival, the avatar moves there and into the village where the carnival is performed. The scene then changes, showing the characteristic places and people of the chosen carnival.



Fig. 1. The world map with carnivals that can be visited.

The player is then brought into a 2d representation of the place, filled with the characteristic objects and places related to the ritual identified. By clicking on one of these objects or places, the wheel of senses will appear, and the selection of a sense will show the related data.

Let us imagine that the player chooses the Bagolino's carnival: the avatar travels there with his hot air balloon, descends into the village and the map changes to that of the town of Bagolino (Fig. 2), filled with all the objects retrieved from the database: there are masked people playing violins and others performing dances, then the player clicks on them, and the wheel of senses appears. At this point, selecting the "Sound" icon will play the typical carnival violin music, clicking on the "Sight" icon will show

a typical carnival dance, and each fruition will be briefly explained by a message that may also refer to a web address of more detailed resources.

Following this example, a possible storytelling/gamification goal could be a character encountered on the main page who asks the player to find his lost violin. The player will then have to get on the hot air balloon and explore different carnivals to find out which ones have violin music, then grab a violin (through the hand/touch sensory icon) and return it to the character at the beginning of the journey. Another possible objective may be to help some typical characters of various carnivals encountered by the player along a route, who tell of being lost; the player must then, through analysis of the clues provided by the characters, find the carnival of each and bring them home.



Fig. 2. The “Bagolino” carnival with a point of interest and the wheel of senses.

4 Conclusions and Future Works

In this paper we have presented a prototype for the creation of storytelling tools involving intangible heritage resources retrieved by the QueryLab portal. Future developments of this project aim to simplify the accessibility and the retrieval of data, also considering the often-limited number of resources on certain intangible heritage themes, with the objective of guiding the game developer in the process of creating animations. Through the creation of a dashboard, the expert is guided in the creation of characters, elements, themes, and objectives, producing a model that is fed to the engine that generates the game. The idea is to automate the majority, if not the entirety, of the process, by generating these journeys (games) for various topics in a procedural manner with as minimal human effort as possible.

Acknowledgements.

Thanks to Alice Gasparri (University of Genoa) for her valuable work in developing the graphics for the game.

References

- Artese, M. T., & Gagliardi, I. (2022). Integrating, Indexing and Querying the Tangible and Intangible Cultural Heritage Available Online: The QueryLab Portal. *Information*, 13(5), Article 260. <https://doi.org/10.3390/info13050260>
- Campbell, J. (2008). *The Hero with a Thousand Faces*. New World Library.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining "gamification". In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9-15). New York: Association for Computing Machinery.
- QueryLab Portal*. (2023, May). <http://querylab.imati.cnr.it/>
- Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017, April). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*, 69, 371-380.
- Sherry, J. L., Greenberg, B. S., Lucas, K., & Lachlan, K. (2012). Video game uses and gratifications as predictors of use and game preference. In *Playing Video Games* (pp. 248-262). Routledge.
- Unesco ICH*. (2023, May). Retrieved from List and the Register of Good Safeguarding Practises: <https://ich.unesco.org/en/lists>
- Vrettakis, E., Lougiakis, C., Katifori, A., Kourtis, V., Christoforidis, S., Karvounis, M., & Ioanidis, Y. (2020). The story maker-an authoring tool for multimedia-rich interactive narratives. In *Interactive Storytelling: 13th International Conference on Interactive Digital Storytelling, ICIDS 2020* (pp. 349-352). Springer International Publishing.

Received: March 24, 2023

Reviewed: April 15, 2023

Finally Accepted: May 25, 2023