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Phantasmagoria

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Phantasmagoria

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Abstract: 'Phantasmagoria' is a game prototype conceived in September 2019 for the Museo Nazionale del Cinema, Torino, in Italy. It received the "Best App for the Integration of Game Play and History of Architecture" award in September 2019 in Torino, Italy. The lessons learned from this urban and landscape cultural heritage game design project was later partially applied to aspects of the Museum of Nevis History in Charleston, Nevis Island during a two-month long project. This project, 'Enlivening,' emphasizes how their history of slavery goes beyond the museum walls. The aim of this article is to outline the practical implications of this fast-growing trend in museography as a means for visitors and stakeholders to experience inclusiveness, opening the vista to participatory process into the narratives and reinterpretations and expanding the museum role in contemporary global and multicultural societies. This shift is possible through digital technologies and game-based principles that facilitate outdoor and indoor museographic deployment; redefine new physical and virtual boundaries; and transform museum management, management tools, and user interface devices. This article emphasizes the use of visitors' smartphones as a device to articulate multiple layers of dataset, experiences, narratives, and feedback to extend the link and relationship with the museum from distant locations and times.

Keywords: AR, QR code, Game, Inclusiveness, Cultural Heritage Management, Landscape, Smartphone

Introduction

Discreet familiarity of landscape (Relph 2019) tends to shadow the cultural heritage embedded within the facades, buildings, places, streets, gardens, parks, villages, cities, and natural reserves up to the wildlands. The built environment is the embodiment of social values that are materialized through the encoding of non-verbal and symbolic forms that constitute the cultural landscape (Rapoport 1977) and embrace the planted and cleared forests, diverted streams, fenced fields, mews, paths, and roads that lead to settlements and dwellings (Rapoport 1994). Immersed in daily life, we tend to forget the prime relation that groups of humans have developed with their environment to ensure livable conditions. In 1962, UNESCO recommended a concern regarding the Safeguarding of Beauty and Character of Landscapes and Sites; in 1972, landscape was designated as the "combined works of nature and of man" (UNESCO 1973); and finally the cultural landscape concept—embedding the definition that landscapes that are designed and created intentionally by humans (Rössler 2000)—appeared in 1992 through the Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO 1992). This late and slow recognition of man/nature association demonstrates the underestimated and invisible nesting between cultural heritage and landscape.

In a globalized mass tourism world populated with aggressive marketing strategies for countries, regions, cities, activities, competitiveness, and attractivity, the profusion of visuals (Venturi, Izenour, and Brown 1977) eclipses the cultural heritage assets. These last assets are replaced more and more by translocated and commercial transcultural substitutions (Marinelli 2019), interrogating the notion of authenticity. Beyond the Disneyfication phenomenon, these borrowed "landscapes" are significantly stating that a glocal change is in process within the societies, encoded within territories conforming "standardized or generic" landscapes.

At the time of the digitally savvy and consumerist society, how can the cultural heritage "infrastructure" ensure structural sustainability, fill its secular mission, and cope with societal changes? How can smartphone holders be enticed to raise their eyes to the surroundings that

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they tend to ignore? How should multiple needs and visions of cultural heritage consumption be accommodated? How can we address the growing dichotomy bridge between the culture enthusiasts eager to capture a sense of heritage encapsulated onto the places as well as the speedy sightseers prone to gasp a glance of culture, ready to tick a cell on their to-do list?

This intricated situation is challenging the diverse aspects of museography that are rarely proposed to visitors: (1) physical and virtual immersion into the contextual built-environment through multi-sensory outdoor experiments inviting to get indoor and vice-versa; (2) roleplay as an inclusive means to plunge participants into social, cultural, and technical context within their associated historical milieu (Salter 2009); (3) shift visitors' focus to make their immersion a sensorial reference, enabling their valuation of historical narratives; and, (4) dissociated or shared experience to develop a viewpoint that entices visitors to question and discuss. Such dialogue and contribution help museums evaluate their reinterpretation and formalization adequately.

This people-centered trend is changing the museum's role and field of action and, above all, its aura, representation, expression, operation, and management. However, behind the scenes, the museum and museum personnel are pressured to deliver up-to-date, fashionable, and digital production to cope with fast-changing technologies. In the rush, the digital choices are often based on technical values and its potential "wow effect," resulting in a shift of priorities in the technical device instead of the museological discourse. This risks a lack of semantic concordance between museological intent and the technologies used—especially when social inclusiveness is the target—and causes technology distractions in the worst cases instead of educational conduciveness. Generally, it has shoved for the systematic call of external experts instead of building internal capacity. In the light of current trends toward the technocratization of the field, the challenge is how museums and their personnel can keep a sense of ownership of their métier, tools, know-how, and museological discourse.

The two case studies addressed in this article were intended to renew and redefine museal and social relationships. The first case study involves the prototyping of a roleplaying game for The Museo Nazionale del Cinema, Torino, in Italy; called *Phantasmagoria*, which was developed in September 2019, while the second game, *Enlivening*, was created under the setting of digital experience at the Museum of Nevis History, in Charlestown, Nevis Island, in the West Indies and developed between October to November 2019. Both experiences were relevant to answering the following questions: How can museums keep a sense of ownership of their tools, know-how, and museological discourse? How can they ensure the perception of museological efficiency as the result of semantics concordance between the narratives, artifacts, and technology use? How can digital aspects expand the museums beyond their walls and enable them to become part of an ecosystem?

The *Phantasmagoria* and *Enlivening* projects were short and quick explorations without a planned framework; therefore, this study follows an empirical methodology based on feedback in correlation to the clients' aims, limited means available, and collective effort deployed. Overall, the emergence of a collective intelligence was displayed. The *Phantasmagoria* prototype ended with the workshop, but its outputs became the source of inspiration for *Enlivening*. For the latter, due to the COVID-19 outbreak, data was collected from December 2019 to March 2020. These four months of collection make a formal evaluation and analysis difficult since the pandemic had already slowed down the number of visitors before the total closure of the museum. Our argument focuses on the design and development phases, along with the potential based on feedback from owners, visitors, and the few numbers collected before the COVID-19 lockdown. This extrapolation opens the reflection on how the digital and non-digital toolset can provide support for landscape and urban cultural heritage as an applied field for social inclusiveness. This article aims to open the perspective of a possible implementation of these types of tools and technologies, sharing thoughts and ideas as a stepping stone.

First Exploratory Experiment: *Phantasmagoria*

Project Owner

The Museo Nazionale del Cinema (MNC)—the first Torino Italian cinema town prior to Cinecitta in Roma—has been rewarded for best digital applications for museums for several consecutive years since 2014. Aside from its 35,000 square feet of exhibition, it hosts a collection of archives donated from the moving image industry, the town of Torino, and other individuals. Those documents are all digitalized, classified, and accessible through the European initiative I-Media-Cities, an ambitious and innovative European Union-funded research. It is a collaboration between eleven film archives, six research institutions, two large digital expert centers, and an expert in business models. From 2016 to 2019, they developed a web platform that provides access to historically digital films and photos of European cities.

Demand

MNC's goal is to find new ideas on how to use the I-Media-Cities archive through the principles of gaming to stimulate queries on urban spaces and landmarks. The challenge is to build an ecosystemic service around a highly specialized database of film and photographic images from eleven film-centric cities and to vertebrate—structure, consolidate, articulate, and fluidify—a joint cultural action within the cities. The overall intention is to extend the museum's remote activities to generate vibrant local, tourist, and online participation and to decompartmentalize the research data to a wider and amateur audience. The propositions are expected to incite excitement and passion for investigation and research on the "city and cinema," as a particular topic generating singular urban and architectural figures.

Framework and Team

The game prototype was conceived by a group of five participants during the Torino workshop "Learning by Game Creation: Cultural Heritage, Cities and Digital Humanities" held at PoliTo, organized by professors Rosa Tamborrino (PoliTo) and Willeke Wendrich (UCLA), with the participation of professors Erik Malcom Champion (UNESCO chair and Cutlin University), Anthony Caldwell (UCLA) and the social simulation game designer, Łukasz Jarząbek (Centre for Systems Solutions). This interdisciplinary team brings together academics and professionals engaged in the gamification of digital cultural heritage and social inclusion. Social simulation illustrates the transformation of modern social science research into a métier that combines general systems theory, complexity, computer simulation, and modeling of social phenomena; its completeness encompasses the gameplay mechanisms, which favor and facilitate the gamification process.

The design team was composed of multicultural and interdisciplinary members from different countries (USA, France, China, and Algeria): Lili Raygoza (University of California Los Angeles), Chen Li (Harbin University of Science and Technology), Jingyi He (Guangdong University of Technology), Leila Harkat (Urban and Architectural University of Hassiba Ben Bouali Chlef), and Louisette Rasoloniaina (University of Paris and Paris Val de Seine National Architectural School). The team was supervised by Professor Andrea Giordana (University of Padova). The participants had no background in game design.

The workshop started with a Torino scavenger hunt using the Actionbound application. This experiment was a stepping stone to envision how a city visit can turn into a smartphone-guided rally. This preliminary exposure to revisit the city tour helped with imagining what could be added to an architectural and urban landscape digital cultural heritage immersion to serve the purpose of MNC.

Phantasmagoria Findings

Game Semantics

In fashion during the eighteen to nineteenth centuries, phantasmagoria is a spectral theatre using lanterns to project images, such as ghosts, demons, and skeletons, onto walls and semitransparent screens. The displacement of the projectors allows the kinetic animation, appearance, scaling, and disappearance of the frightening figures to provide viewers with an unforgettable sensorial experience. Within MNC exhibitions, the phantasmagoria section plunges the visitors into a special scenery where ghostlike figures emerge from the walls, and in memory of Belphegor haunting the Louvre Museum, the emergence process is the mechanism used in the *Phantasmagoria* game.

'Phantasmagoria' Game

In its first version, *Phantasmagoria* puts an emphasis on the 1930s cinema industry and cultural heritage, immersing the players into the planification, construction, and use of the movie theatre and movie production set and site. This allows players to revisit the technologies, aesthetics, artists, social values, and spirit of the period. Through different roleplays, it is an architectural and urban treasure hunt through Torino history and cityscape.

Objectives

The game's general objective is to learn about the film industry in Torino using the archive of the Museo Nazionale del Cinema. The game uses virtual reality (VR) and augmented reality (AR) technologies. It allows players to physically and virtually (*Minecraft* 3D model) tour the city of Torino in a historical context using contemporary and heritage material; acquire knowledge via the tour experience through observation, imagination, and creation based on archival material "performing" a historical reconstitution; and create, stage, and share individual or group narratives of the city and the film industry history.

The player has the capacity to learn three major aspects of that specific heritage. They can evaluate continuousness or ruptures from the historical period to the present, seize the technological and aesthetical evolution in building, and recontextualize the cultural heritage material tied to 1930s Torino and how the political context gave form to specific aesthetic and perspective. The game's specific objectives are to learn about historic building elements in their context and to remodel accurate architecture that was used for the film industry from different perspectives given through several roleplays, allowing extensive use of the MNC archives. Political understanding is turned into symbolic, architectural, and urban forms.

Target Groups, Game Location, Numbers of Players

The target group is wide and intergenerational for any smartphone user, tourist, individual, or group that is interested in Torino heritage in the cinema industry, MNC, and I-Media-Cities visitors. The game can be played at home, school, on the website, in the museum on the interactive pods and rooms dedicated to it, and mostly in town with AR. The game accommodates individuals, teams, tournaments, challenges, and social community portals.

Different Interfaces and Their Interconnectivity

The game interfaces include any generic devices that can connect to the internet, such as smartphones, tablets, computers, game consoles, and specific pods in the museums and within the city landmark spots. A multi-cross-platform solution is required to permit a wide range of possibilities to play the game indoors and outdoors, in remote locations, or in situ. From individual to the team play, indoor or outdoor, the various interface type is made possible through a web-based game. Therefore, the type of interface is up to the player—only an internet connection is required.

The I-Media-Cities provides useful archive data, and MNC hosts a dedicated high-tech game room and several pods within the museum. They are both gateways to the game, but one is virtually online, and the other one is in the physical world. Both interfaces host a Hall of Fame, creating gamer visibility and identification according to their performance and making use of a database system. This multiplex system broadcasts simultaneous games and connections from different locations.

Game Elements: Gamified Historical Elements

Along the physical and/or virtual game, the player explores the city, and the selection of the right figures in the landscape provides hints through the disclosure of historical elements, making play an active learning process, which enhances city sighting and touring.

Figure 1: Large Range of Data Types
Source: Rasoloniaina

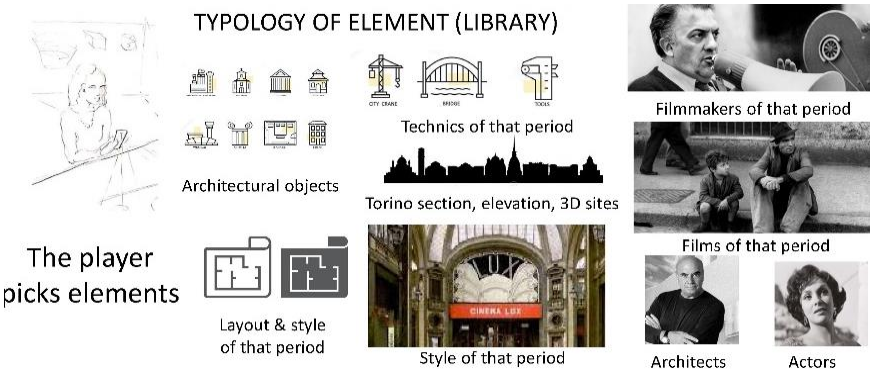

Figure 2: Constitution of a Rich Object Library
Source: Rasoloniaina

During the game, the player picks elements from a library composed of many object-families, subdivided by style and period (Figure 2). The coherency of the picked objects is manifested by points. The rewarding of good selection is one of the motivation mechanisms that entices the player in constituting a coherent collection validated by the game engine. The gamification of heritage requires the modeling of architectural, urban, and film industry elements that can be of two natures: 2D and 3D in high, medium, or low resolutions (Figure 1). In the virtual tour, the *Minecraft* 3D model of Torino City is an attractive game aesthetic suitable for an intergenerational public; its low definition can be balanced by the possibility of the player to view a more accurate model along their exploration.

Game Architecture, Interaction, and Player Inclusivity in the Narratives

At the start of the game, the player creates their own avatar from a selfie. This image will be integrated into the game as the main character's feature, making them a full-fledged actor in the historical reconstruction. Belphegor—the ghost who guides the player through the city tour—has the same face as the player; therefore, he personifies a multiple and ubiquitous entity—the spectator, the player, the learner, and the scholarly spirit (Figure 3). These facets evolve between the real and the game worlds, making the visitor sometimes the questioner, the questioned, and the clue giver; these changes of vision multiply the knowledge acquisition process.

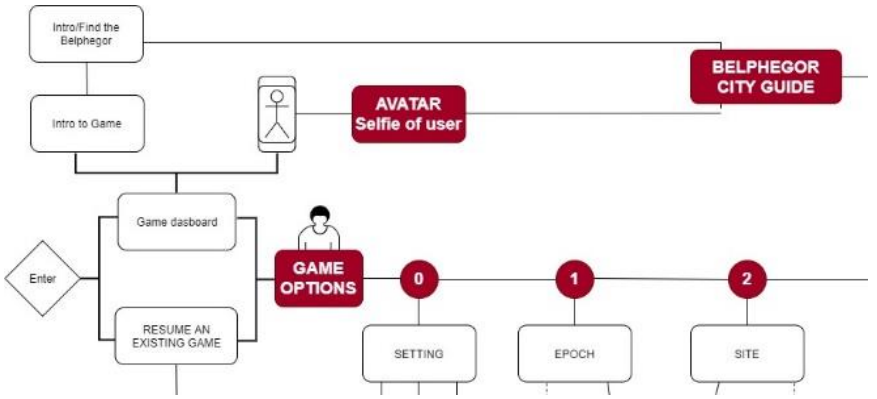

Figure 3: Making of the Visitor / Player as a Game Character
Source: Raygoza and Rasoloniaina

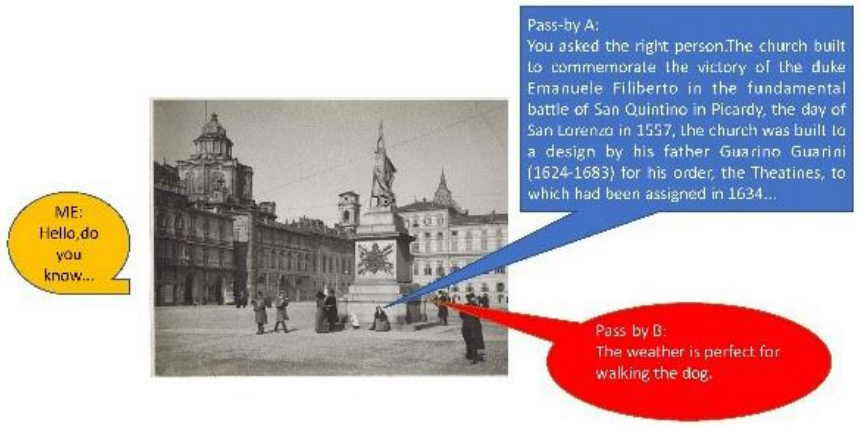

Figure 4: Interplay
Source: He

As with any contemporary video game, the player can call for external players to help, and the game engine can decide to challenge the player at any time, using different stratagem like disruptive conversation or appearance of figures on the virtual or real scenery (Figure 4).

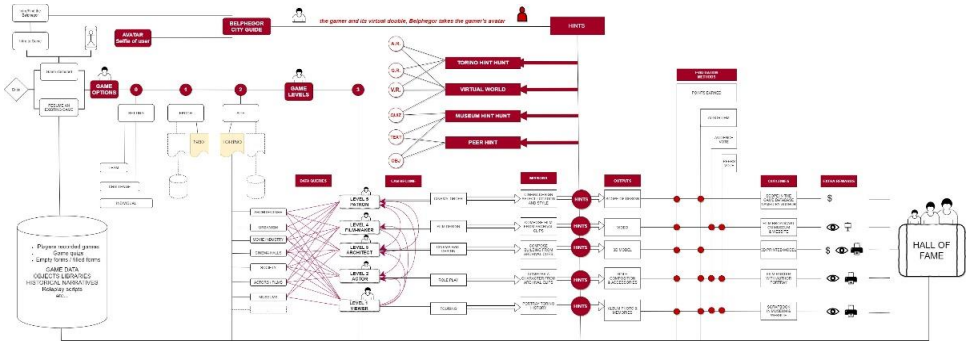

Figure 5: Game Architecture
Source: Raygoza and Rasoloniaina

For simplification purposes, the game architecture sets the structure related to one smartphone user. It does not integrate the possible complex connection with other players nor the I-Media-Cities database that is formalized by the main database cylinder. The diagram illustrates how the different game levels activate different sets of data, weaving different experiences in concordance with the character played (Figure 5).

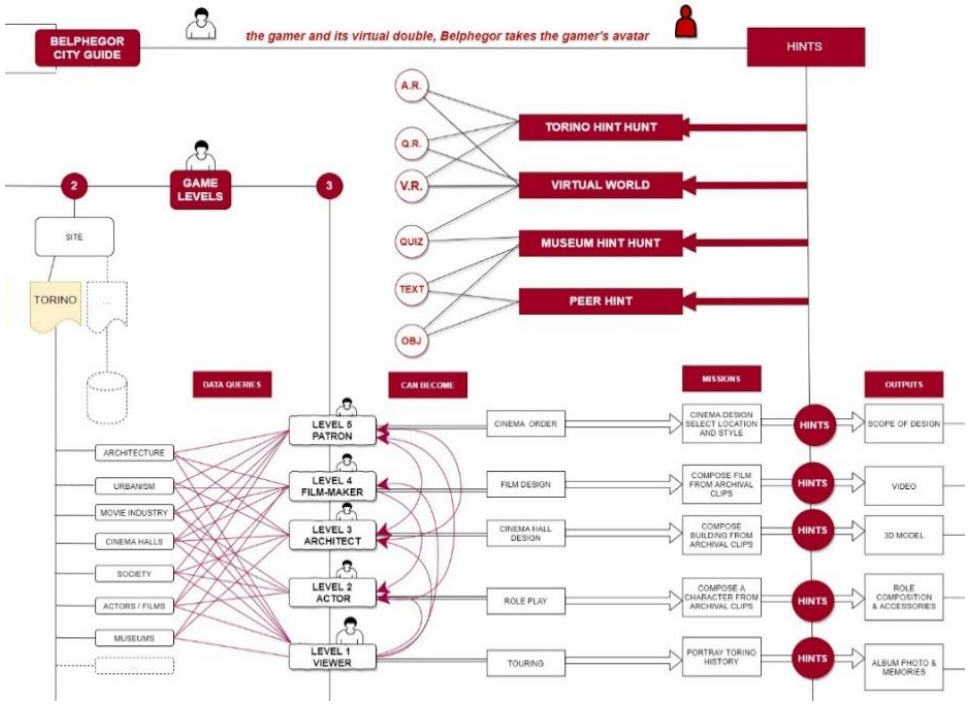

Figure 6: Hint System and Digital Means
Source: Raygoza and Rasoloniaina

The hint system is rich with a variety of digital means like AR, QR code, VR, quiz and form, textual data, and 3D model (Figure 6). This articulation of the game and its architecture is the most important mechanism that characterizes the game appeal and stimulates the players' motivations. The player wins points along their journey and is produces different types of outputs that go through different evaluation processes.

Roleplay Characters, Levels, Outputs, and Rewarding Processes

The roleplay game enhances five different experiences of Torino that are formalized into five levels of the game: starting from a simple viewer, moving toward the cinema industry through an actor/actress character, evolving in front of the camera, and to the filmmaker behind it. The two last levels are related to the movie theater construction, with the architect—as location, style, and technics advisor and designer—to the patron who orders the building project.

Figure 7: Five Levels with Five Different Experiences of Torino
Source: Li

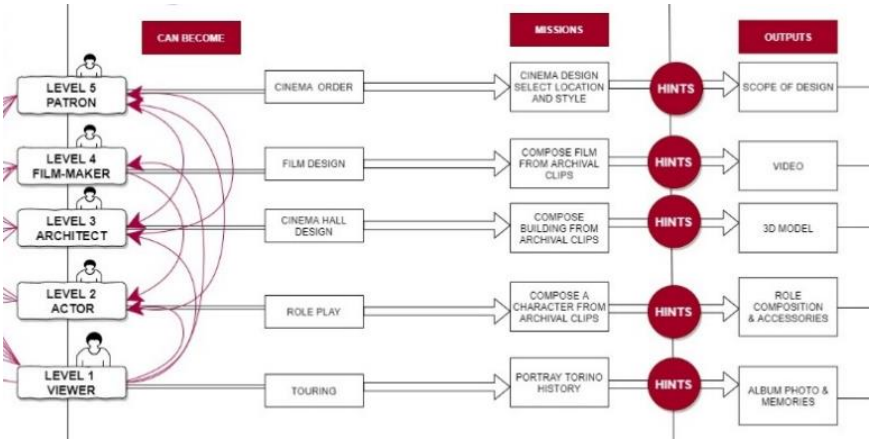

Figure 6: Game Architecture of the Five levels, Missions, and Outputs
Authors: Raygoza and Rasoloniaina

Through the levels, the player has different vistas, experiments, and historical narratives from different viewpoints. This plural aspect has the potential to maximize the archive usage and archive donation since all players can contribute to the archive by donating the photos that they took during their game journey through real Torino or its *Minecraft* version.

The highest level is the patron, who is the movie hall commissioner. His output is a scope of design that is evaluated through an algorithm tracking sound, credible, and innovative

scenarios. The matching pieces are nominated for game "owner scenarios," which means that the player's scope of design is integrated into the game scenario selection, and they can earn an author royalty contract. Every time an owner-player selects a mission, they receive privileges, gifts, extra points, or financial retribution.

The architect level reward goes through the same process. In this level, the price of the 3D printed model of the movie hall is designed by the player. The player's model is on sale in the museum shop. For the first three levels, the reward processes go through additional votes from I-Media-Cities, the museum audience, and peer players. For all players, their outputs and points are shown in the Hall of Fame displayed online and at the museum.

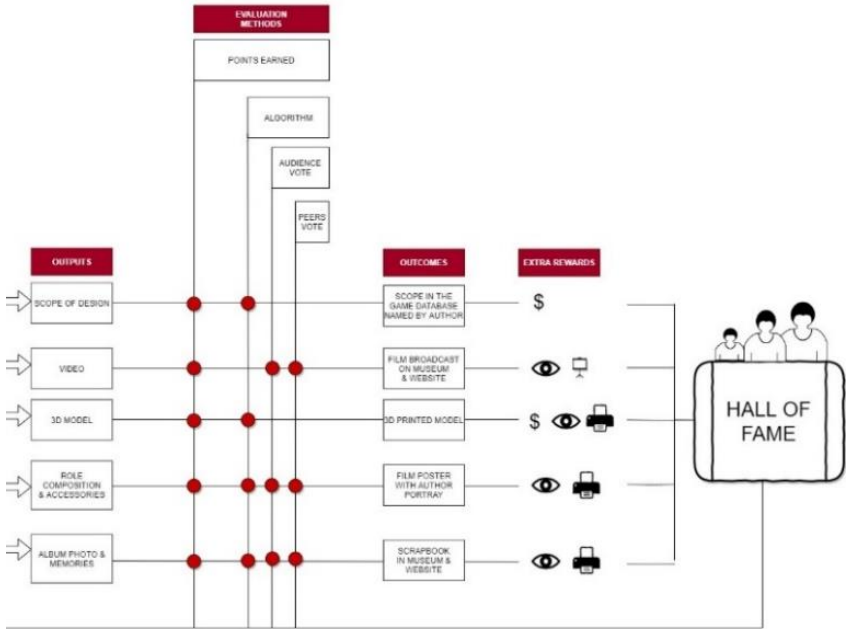

Figure 9: Game Architecture of the Five Levels, Missions, Outputs, and Rewards
Source: Raygoza and Rasoloniaina

The game implies strong physical and virtual articulations with the museum and I-Media-Cities platform. It changes the relationship with the visitor, allowing them to become an actor of the current activities and rework the historical narratives. This close, vivid, and active link promotes social inclusiveness, diversity, and visibility, enlarging the perception of the museum beyond its walls as part of the embodied life and spirit of the city. Through the players end products displayed and advertised by the museum, I-Media-Cities platform, and the city, each production contributes to the city's attractiveness by its perpetually revisited charisma. The number of players, productions, and visitors reflects popularity, brand image, and social reputation; taking these indicators into account, the city and the museum are allowed to be more responsive to social changes.

Illustration of the Game Interface and Play

The interface of the architect role is presented to illustrate the gameplay. The architect receives a mission folder with the scope of work for a cinema hall construction ordered by the patron; it contains the contracts and the assignments (Figure 10).

Figure 10: Architect Mission Folder
Source: Rasoloniaina

On the left side, a multi-level library provides complementary datasets, highlighting cultural, political, aesthetical, technical and historical information related to the design period.

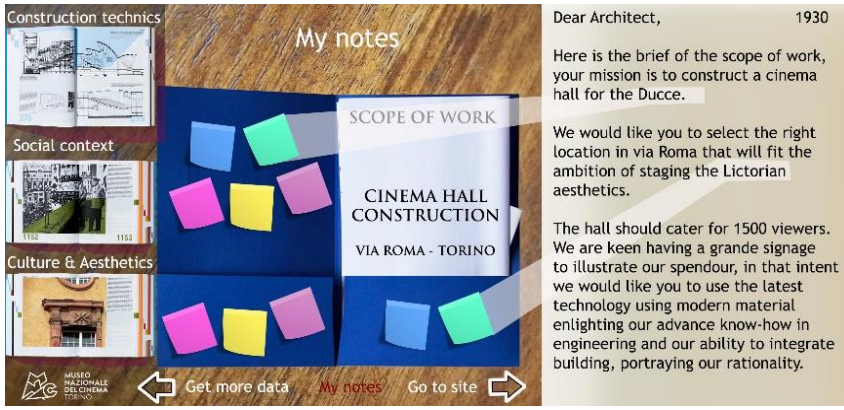

Figure 11: Player Notes
Source: Rasoloniaina

The player(s) can take notes from the documentation and refer to the notes and add-ons that they have collected. All specific vocabulary and elements can be clicked to learn their significance and detailed information, i.e., the Lictorian style promoted by the Ducce (Figure 11).

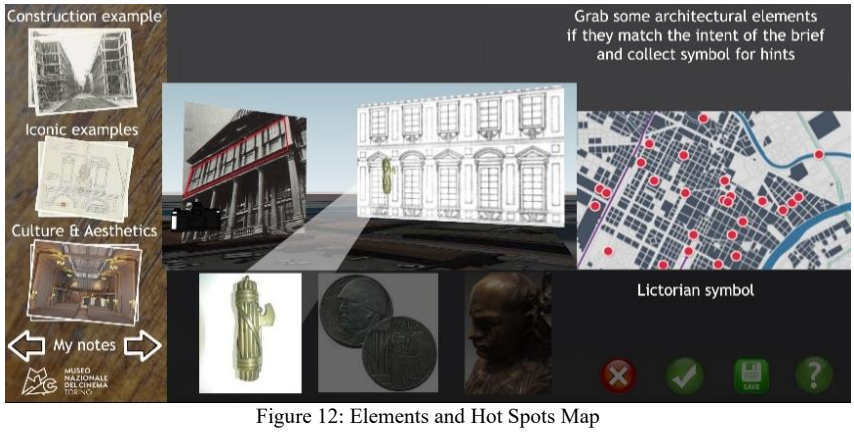

Figure 12: Elements and Hot Spots Map
Source: Raygoza and Rasoloniaina

The player(s) can collect elements that match the vision of the owner through their journey (Figure 12). For example, the architect must consult archives to decide on the best architectural style and element to put on the project.

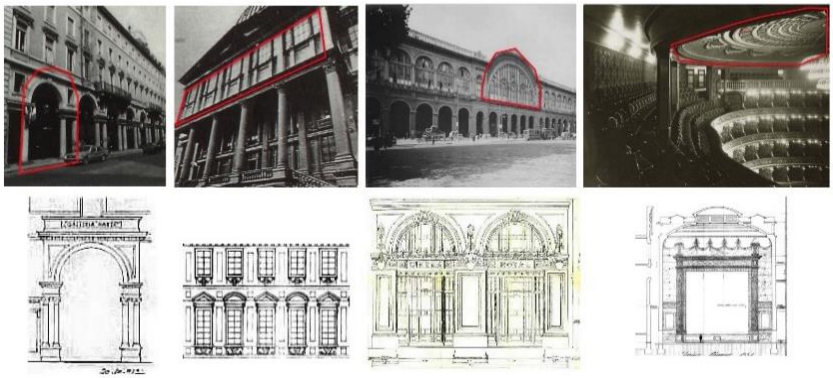

Figure 13: Outdoor and Indoor Architectural Elements
Source: He and Raygoza

While treasure hunting using a smartphone (in the city) or a screen (on the *Minecraft* Torino 3D model), some architectural elements are highlighted when the player is nearby (Figure 13). These can be collected or selected for data requests.

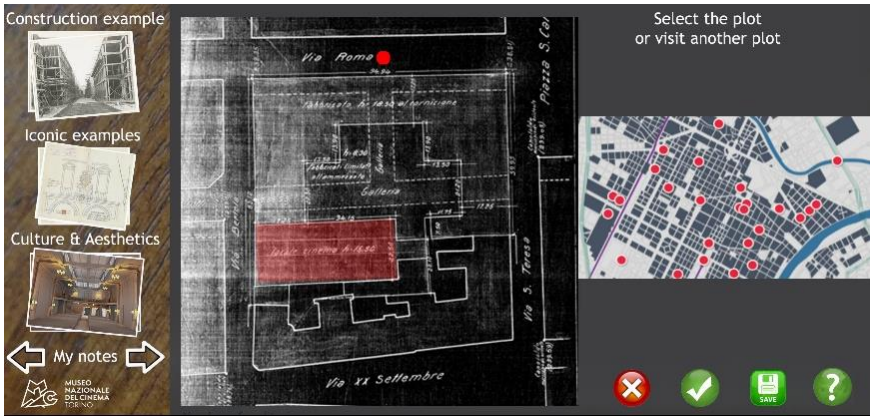

Figure 14: Player Selecting a location to Match the Owner's Project
Source: Raygoza and Rasoloniaina

After selecting a spot in town (Figure 14), the architect has to figure out the dimensions of and configure the movie hall according to the specifications of the patron and follow the architectural and urban rules, regulations, and aesthetics of the chosen time period.

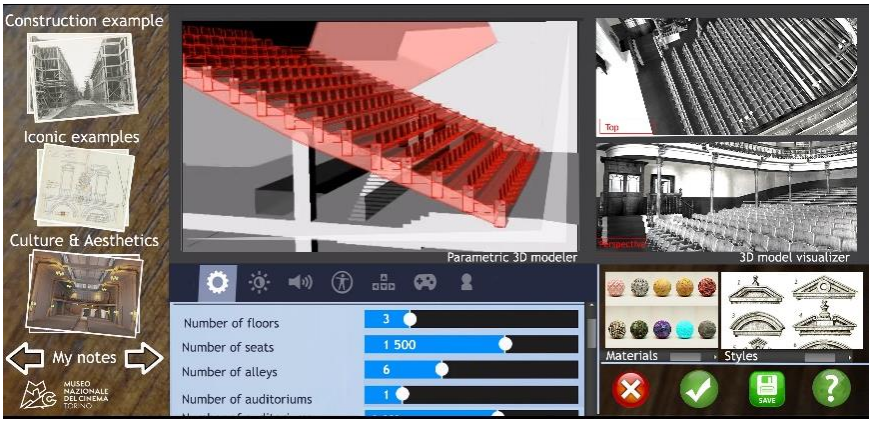

Figure 15: 3D Configuration Dashboard
Source: Rasoloniaina 2019

The architect has access to a 3D modeler to create the architecture, volumes, spaces, and surfaces (Figure 15). The mock-ups can be characterized until the finalization of the materials and their textures.

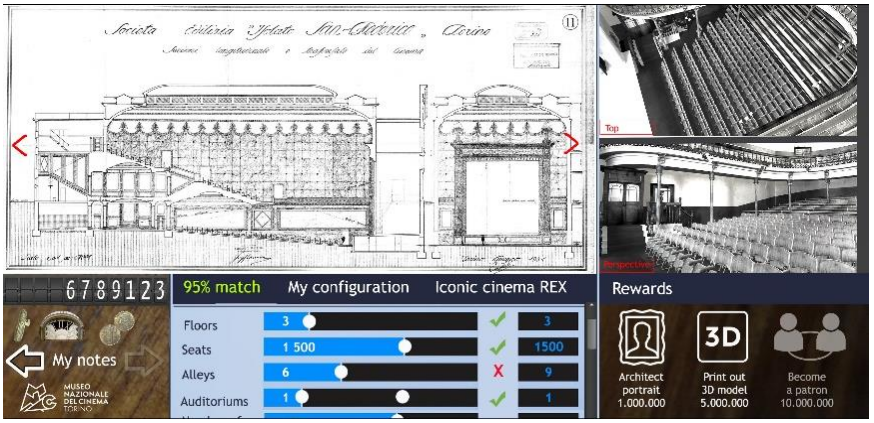

Figure 16: 3D Configuration Evaluation by Algorithm
Source: Rasoloniaina

After the architect has validated the completed mock-up, an algorithm checks and compares the model with ones stored in the database and calculates the matching probabilities between the project and built cinema halls of that period (Figure 16).

Figure 17: Hall of Fame
Source: He et al.

The central database keeps track of all the 3D models, 2D layouts, narratives, solved mysteries, etc. Top gamers, top 3D models, top narratives, and top reconstitutions are displayed on the first page of the Hall of Fame. The Hall of Fame is also the meeting point for groups of gamers and communities competing for the best story or outputs (Figure 17). Tournaments can be organized by the City of Torino, the MNC museum, or the I-Media-Cities platform. All these events contribute to the creation of a ubiquitous cultural heritage ecosystem, contributing and consolidating its robustness, pertinence, reality, and social integration.

Phantasmagoria Results

Landscape: Renewed Regard, Ubiquitous Augmented Reality, and Social Inclusiveness

The landscape culture is related to contemplation, a static posture while admiring scenery. *Phantasmagoria* invites visitors to pay attention to the landscape, including tangible and intangible assemblage (Relph 2019), while they are in movement. The game makes the elusive landscape a multidirectional spot for clues using cognitive abilities to discriminate details, zoom in and out, and connect indicators, making each landscape incredibly special, unique, and informative.

> "But what we are doing, we are able to make a lot of people aware of what exists and interests them in that. The more people know about these places and start to care about them, the more we can trigger an interest. And that is a path to preservation. This is a way of saying: this is important, we need to care about it, it must not disappear. It's about making people curious." (Donlan 2018).

The multiple entry points to the *Phantasmagoria* game allow a wide range of participants to connect from different locations and equipment, such as Xbox, PlayStation, tablet, smartphone, museum, and city pods, making the game socially inclusive. The players' creativity and productions are rewarded through evaluation algorithms, allowing the game to update with new scenarios. The Hall of Fame gives visibility to all gamers and their performances through the museum, city, and web interfaces. Beyond the activation of curiosity, digital game-based museum dispositive allows the visitor a simultaneous ability to be a player, learner, contributor, and even cultural activist.

Semantic Concordance between Museological Intent and Technology Used

In *Phantasmagoria*, the spectral figure personified by Belphegor—materialized by the player avatar and integrated as an integral game character—embodies the information emergence within the indoor and outdoor built environment. The AR mechanism is like a ghost hunt,

inviting the viewers to look for auras, visual elements that trigger the AR, through the outdoor, indoor, and pictorial landscape, and makes viewers pay attention to all signs, symbols, images, layouts, and details. The AR semantic reveals reality multilayers like parallel worlds, whereby some components can emerge through a spectral, prismatic, or optical device. This makes an astonishing adequation between the intent and means used.

Part of an Ecosystem

While dedicated to Torino City, the game can be expanded to other cities enlisted within the I-Media-Cities platform. The structure has the potential to become a game engine for any city with any cultural heritage to enlighten or create a ring of galleries, libraries, archives, and museums (GLAMs) internal experts involved in gamification, knowledge sharing, and know-how.

> The increased use of and reliance on digital resources has blurred traditional distinctions between information organizations, leading to a digital convergence of libraries, archives, and museums, and encouraging more research examining how libraries, archives, and museums can collaborate and combine forces to better serve their users. (Marty 2010)

In the 80s in Paris La Villette, the 'Cité des Sciences et de l'Industrie' has inaugurated a new typology of public media center facilities: a hybridization between a museum, media library, social information center on industries and métiers, and leisure park; it is only toward the end of the 90s that Idea Stores or Discovery Centers appear in the UK. The latter push the phenomenon and the ambiance further by creating true vertical public places and plazas in the core of popular district, where users are warmly welcomed, comfortable, and can access free services as in a social and cultural community center that make them feel part of the social and cultural landscape and part of the making of the city. These initiatives were already laying the foundation for social ecosystemic infrastructures, and their interoperability and interconnections mapping give visibility to the existing strengths, opportunities, and potentialities within the territory. In parallel, the strategy was matching the Territorial Symbiosis (TS)—Circular Economy main principle—mechanisms implemented by the National Industrial Symbiosis Program (NISP) in the UK. In that framework, the gamification of digital cultural heritage approach is shoving the reconvergence of GLAMs toward ecosystemic social services, and it has the potential to merge cultural, economic, and ecological efforts and concerns.

Technology and Role of External Expert in the Museum Capacity Building

Starting the workshop with an *Actionbound* scavenger hunt interactive app for smartphones was a learning process that inspired *Phantasmagoria.* Trained and supervised by professionals and scholars like Erik Champion, the workshop attendees could build prototypes of their own imagination. To highlight their adequacy, in August 2020, PlayStation announced the release of "The procession to Calvary," an adventure game made from Renaissance paintings—a copycat to one of the prototypes designed during the workshop.

The one-week workshop was structured to transmit knowledge and build the attendees' skills. The selection of guests was impressive, and among them, the social simulation game designer, Łukasz Jarząbek, shared his trademarks on how to change the mindset of users using game as a social or entrepreneurial transitionary tool. Museum professionals and personnel need to be exposed to new technologies and new concepts and upgrade their competency to conceive and serve interactive, enjoyable, inclusive, and educational exhibitions.

Reception, Reactions, and Further Potentialities

The *Phantasmagoria* prototype was rewarded "Best App for the Integration of Game Play and History of Architecture" by a jury composed of the client and workshop experts. The team heterogeneity was a key factor in the success since all members brought their inputs in the

making and concept. Due to its complex and costly features, the game could not be implemented right away, the pandemic has put the project on hold, but it will certainly remain a prototype. The presented architect roleplay was the most difficult and needed optimum use of architectural heritage and object. Aside from that role, the filmmaker and the movie hall patron role, which involved viewers and actors, could have been carried out in the first phase of development. In the game industry, the release of a first version opens the vista to future versions or updates. With that frame of mind, the museum can adopt this logic of incrementing exhibition to create an entertaining link and relation with the visitor or gamer. Nevertheless, as precedence, *Phantasmagoria* has tremendously influenced the next case study.

Second Exploratory Experiment: *Enlivening*

Project Owner

The Nevis Historical and Conservation Society (NHCS) is an NGO established in 1980 by individuals who wanted to watch over Nevis Island historical sites. Its sources of income include endowments and pledges, admission fees, donations, grants, museum shop sales, fundraising events, membership fees, and a small subvention from the Nevis Island Administration. Therefore, voluntary involvement and contribution played a major role in the development of the society.

The NHCS has made very meaningful contributions to the development and dissemination of historical data by undergoing archaeological surveys and excavations, taking conservation measures, and reinforcing the visibility of landmark sites on small- and large-scale initiatives, like the Charlestown Walking Tour and the Nevis Heritage Trail. It also collects the material culture of Nevis from prehistoric times to the present and organizes it on different sites of the island. The society cooperates with regional and international organizations with similar goals. Its mission is to save historic Nevis, the "Queen of the Caribees," and to retain the past splendor through the protection and promotion of tangible and intangible heritage. Within this framework, NHCS has established three museums: The Museum of Nevis History, the Nelson Maritime Museum, and more recently, Alexander Hamilton House.

Demand

The NHCS' growth, maturity, and reputation lead them to undertake a more ambitious step. *Enlivening* is a pilot exhibition of a vast renovation program to mark NCHS' fortieth anniversary planned for 2020–2022, referred to as the 2020 Culture and Heritage Action Plan. The aim is to combine their numerous initiatives into a major enlivening of Nevis culture and heritage, engaging local stakeholders as well as visitors through participatory activities, refining narratives, and reviewing historical discourse and presentation forms. This new exhibit is intended to rework the storyline and its delivery for contemporary audiences by embracing digital opportunities to create up-to-date museum experiences, making the entire island of Nevis an open-air museum for exploring, creative learning, and sharing.

Framework and Team

Enlivening was conceived by a pair of consultants during a two-month quick-action project to explore and establish the pilot setting of NHCS museographic and new social policies. The team was composed of Lorna Abungu, museum advisor and former executive director of AFRICOM and the International Council of African Museums, museologist, and archaeologist, and Louisette Rasoloniaina, Université de Paris and Ecole Nationale Supérieure d'Architecture Paris Val de Seine and architect-scenographer. Their collaboration has been on the international and historical

reinterpretation of museum and exhibition settings since the 1990s, mainly for National Museums of Kenya (NMK), but it is their first time to use digital solutions. They were given support by the NHCS staff members, volunteers, and Nevis private sectors in the making of the pilot exhibition.

'Enlivening' Findings

Background

Phantasmagoria exploration received a partial application on the Museum of Nevis History (MNH) in Charlestown Nevis Island during a two-month project to set an exhibition for the museum as a quick action prior to cruise season in the Caribbean. This temporary exhibition is a pilot test for innovative technology, museography, and scenography in preparation for a major renovation program, which comprehends the Horatio Nelson, the Bath Hotel museums, and several archeological sites on the island. NHCS was looking for a consolidating action to bind its various activities and initiatives, such as the Nevis Heritage Trail and the Charlestown Walking Tour, into an overall posture that would unify and make sense to the public.

Objectives

The general objective was to apply the 1970s "New Museology" approach (Ariese 2018) on MNH, dismantling the colonial or imperialist history that was set by NHCS, assuming that their main audience, the North American cruise tourists, is only interested in pre-Colombian and Alexander Hamilton histories. The latter was the first US Secretary of the Treasury born on the museum premises and represents the white colonial supremacy during the golden age of slavery and the sugar industry, which had made Nevis Island the "Queen of the Caribbean" (Hubbard 1998). The highly competitive tourism industry across the West Indies has put these references as strategical narratives to maintain an international reputation and create a sense of distinction among the numerous islands. Labeled by the Caribbean Sea exploration in the fifteenth century followed by the long plantation and slavery episode (Velvet Nelson 2011), the islands are trying to decolonize their history, but this has been largely prevented by the continued reliance on mass tourism and on an outward-looking reputation.

As museum advisor, Lorna Abungu has emphasized the need for renewal of museology by implementing society involvement. As NHCS is already engaged in the protection of biodiversity and environment at the grassroot level, she has advocated for the society mobilization in the community participatory process in their growing dedication to cultural heritage. As Davis (2007) pointed out:

> Museums are important because they serve to remind us of who we are and what our place is in the world. Their power is due to their ability to operate at a variety of levels: they are significant to us as individuals, as a member of a community, even as statement of nationhood…There is also a need to understand how the physical aspects of the environment that are valued by a community mesh with other factors to create a sense of place. (Davis 2007, 53–75)

The museology aim included the following: (1) to take part in the social shift from "plantation to nation" identity (Farmer and Russell 2013); (2) to recontextualize the African and slave narratives; and (3) to stage post-colonial and contemporary Nevisian, Caribbean culture and history.

Target Groups

The MNH's target was to extend the tourist audience to Nevisian stakeholders by staging local intellectuals and artists' works once a month and creating specific activities for the elderly,

schools, and youth. Regarding the latter, the island has no public park; therefore, the youth spend time in the museum's square, but none venture the premises due to a lack of interest. Most of them play games on their smartphones, taking advantage of the free Wi-Fi access until the museum closes. One of the challenges is to get them to go into the museum.

In the 1960s with their independence, the reexamination of Caribbean identities has continued to evolve into the 1980s and reached a peak in the second decade of the twenty-first century, but overriding the translocated eighteenth- and nineteenth-century British model of the museum has remained difficult. These multiparty independent democratic states are made up of people of diverse backgrounds: African, European, and Asian. All are focused on creating a national identity for each island, country, or federation. NHCS wanted to give support to the new sociocultural Caribbean trend in revisiting their multi-ethnicity with an emphasis on African origins and, therefore, cater to local stakeholders' interests and concerns over the rewriting of their local/global histories and contemporary narratives.

Constraints

NHCS call for a quick action force became a two-month mission for all the phases of the study, construction, and completion inclusive. The challenge was high with literally no budget, no specific handy internal staff, no workshop facility, and no equipment for building the exhibit display and renovating the 80 sq. m exhibition space. It is where the new museum orientation made a major difference; the intention to set up a more social inclusive new exhibition gained the attention of a lot of private entities and Neviseans who wanted to contribute and take part in the making of this new museal setting. Eventually, the overall renovation cost $6,000 USD, which is a real performance since the average cost for traditional exhibitions ranged from $270 to $6450 per sq. m in 2011 (Forrest 2011).

Strategy

The museum had to change its narrative to speak to and address the Nevisian interests. Due to financial, time, and mean constraints, the community was turned to in order to find local material and get donations to construct the exhibition. The budget covered the local printing cost of the PVC panels, and the exhibition stands were mainly made of recycled wood pallets, which are found in quantity on the island and also part of the everyday landscape of the Nevisian as they are associated with carnivals and festive events and used for bonfires and barbecues.

The exhibition room has no air-conditioning—only two fans that do not provide enough ventilation. This steaming atmosphere made most of the visitors enter and rush out. We had to come up with refreshing and entertaining museology, museography, and scenography to visually entice the visitor to enter and prolong the journey through a striking, inclusive, and immersive exhibition. We decided to make use of digital means like ARs and QR codes, which are accessible from visitors' smartphones to enliven the exhibition and offer a multi-experience exhibition, with and without a wifi connection.

Action Plan

The fortieth birthday of MNH is turned into a consolidation phase whereby all the NHCS initiatives are interlaced into a concrete web of actions, structuring a credible and coherent identity part of the island landscape.

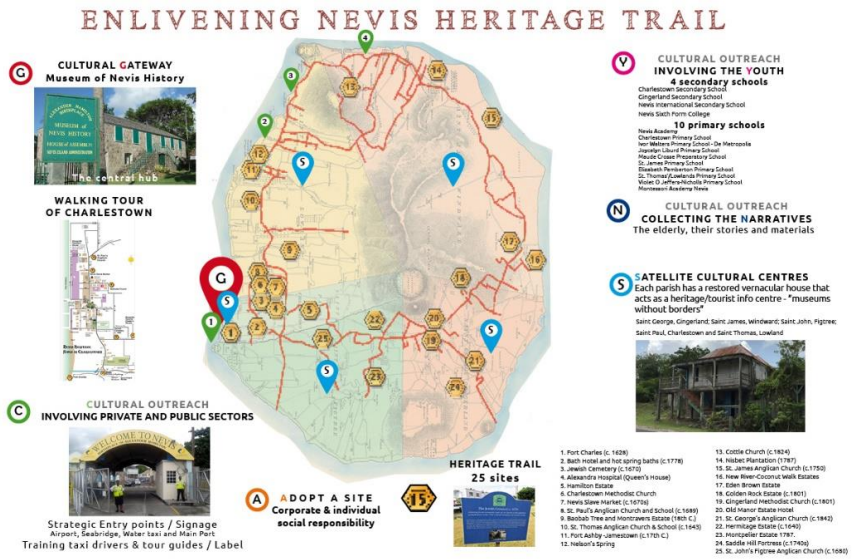

Figure 18: Enlivening Nevis Heritage Trail
Source: Abungu and Rasoloniaina

MNH museum is turning into a gateway for twenty-five historical 'satellite' sites on the island. This weaving of historical networks is an opportunity for visitors and the community to be sensitive to the historical landscape as a dynamic fabric. The project met the government's new policy in training the taxi drivers and the touring guides to spread a sole and solid historical discourse.

Museographic Semantics

The temporary nature of the exhibition encouraged the idea of a flexible holding system, which allows for easy removal and repair using clothespins. These simple and domestic means embody the "laundry drying operation after washing" semantics that echoes the undergoing historical reinterpretation, removing colonial representation and discourse. Along with repurposed wood pallets, those tangible objects send the viewer's imagination back to the day-to-day Caribbean landscape and intangible poetics.

Figure 19: Clothespin Fixing System
Source: Abungu and Rasoloniaina

Multi-Experience/Dataset Exhibits

The typical timeline was also portrayed using a parallel multilayer narrative between Nevisian, Caribbean, European, and African historical events, with an emphasis on Nevisian history that started prior to the slave trade.

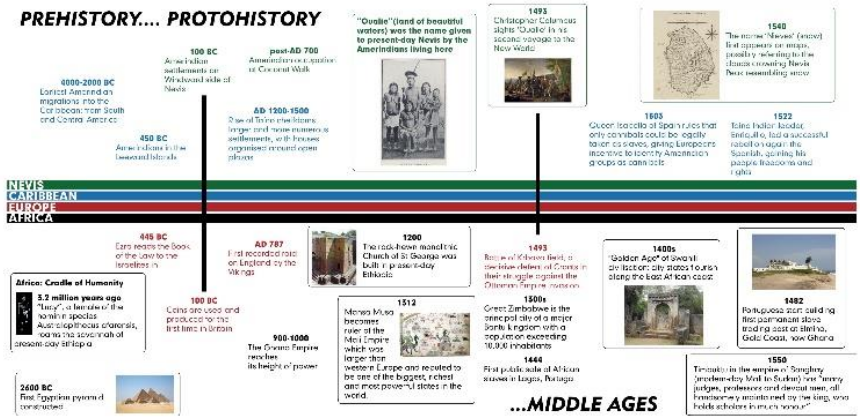

Figure 20: Extract of the Timeline with its Visible Four Layers of Datasets
Source: Abungu

QR codes are disseminated on the timeline, allowing visitors to look further into specific topics, like the forgotten stories of the African emperor Mansa Musa I, the maroons, Queen Nanny, etc.

Figure 21: Horizontal Timeline
Source: Rasoloniaina

The multilayer narrative is a mechanism provoking a visual requestioning of history by juxtaposing local and global data, reinforced by the QR codes, which literally open new vistas for whomever wants to dig into the topics further. The aim of the timeline is to trigger a deconstruction of the narrative; therefore, it had to be a comfortable dispositive, so a table-like device with a slight tilt to ease the viewers reading and instigate the surprise and favor discussion among visitors was used.

Figure 22: MNH Experience Tutorial
Source: Abungu and Rasoloniaina

At the entrance, a panel explains how to use the AR and QR codes using mobile phones. By flashing a QR code, the visitor gets free access to the museum wifi to go through the digital experiences. Some texts were also translated into other languages using QR codes.

Figure 23: QR Code Example
Source: Abungu and Rasoloniaina

The pre-Columbian artifacts are introduced by traditional means and followed by an eye-catching quiz and a QR code that opens a YouTube video on the visitor's smartphone. The visitor can view the quiz answers and complementary information through this QR code. This dual level of information sets a dual narrative: the object layout and the historical reinterpretation.

Figure 24: AR example—Painting with Unnoticeable Triggers/Auras
Source: Rasoloniaina

Eva Wilkin's paintings are testimony of the Nevis past, portraying the life of people within their historical context. The scenery explains Nevis's present landscape, such as the striking presence of donkey colonies on the island (Figure 24). A painting can be enjoyed through its own aesthetics, plastic qualities, and narrative. However, it can also be a support to dig into the scenery and open the view to different topics and perspectives.

Figure 25: AR example—Trigger/Aura Relating to a Cultural Heritage Site
Source: Rasoloniaina

Parts of the artwork (Figure 26) are made into trigger areas that activate overlays stocked on a server, cloud, or web page, and they emerge on the device as a transparent ultra-layer to display animated 3D models and or video. On the painting, the housing zone triggers a 3D model of a typical "chalet" located in the Hermitage Plantation site, one of the 25-Nevis

Heritage Trail spots, sending the viewer back to the *Enlivening* map and inviting them to visit the cultural heritage site and landscape on the Pond Hill in Gingerland Parish (Figure 25).

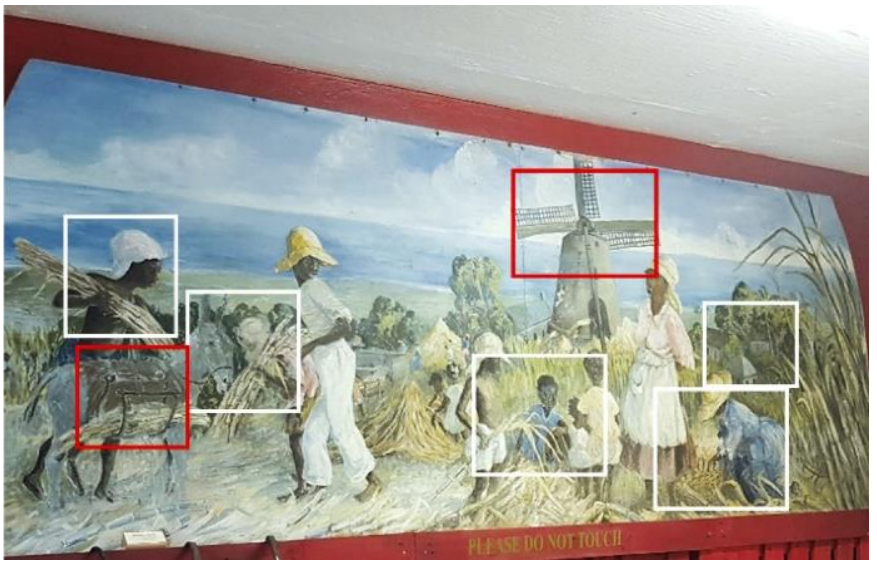

Figure 26: Triggers of Eva Wilkin's Paintings
Source: Abungu and Rasoloniaina

The windmill trigger (Figure 26) launches images of eight blueprints of the Estate Clay Gut windmill in St. Thomas Parish, owned by Charlotte Amalie. The documents are in the public domain, and the originals are currently located in the Washington Library of Congress in the Prints and Photographs Division (Figure 27).

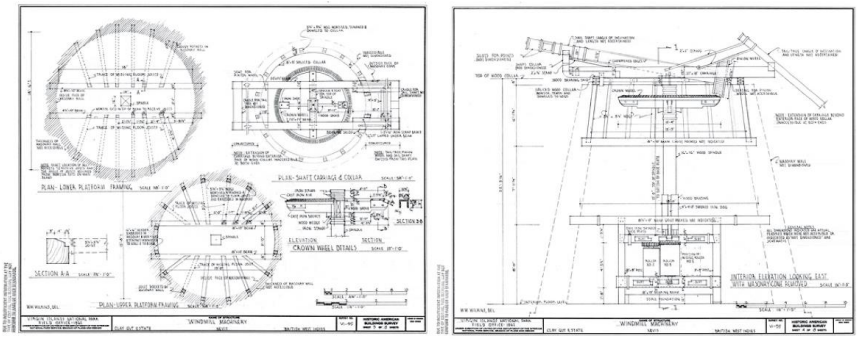

Figure 27: Two of the Eight Windmill Blueprints
Source: Washington Library of Congress

The painting and augmented reality provides visitors the ability to reconstruct the missing pieces of the windmills still present in the Nevis Island landscape through the viewing of the eight windmill blueprints; in the other way round, this painting allowed the discovery of the use of a series of arch-shaped metal frames found in the museum and storage areas. Through Eva Wilkin's work, the team was able to determine that these were sugarcane transport frames attached to the donkey's harness (the lower left red frame in Figure 26).

This technique puts an emphasis on the praxis of looking beyond what is given to see in the landscape. This applies to landscape representation as well as within the real outdoor landscape. Therefore, the museum—through its exhibition—prepares the visitors literally and figuratively to open their eyes and mind before the island tour and twenty-five satellite sites.

Enlivening Results

Familiarity of the Landscape

The MNH exhibition has proven to allow and encourage passive learning of ecological thinking and action. By leading by example, the museum acts as a model of social inspiration. The use of reused wooden pallets and pegs was already an act of bringing new regard to the everyday object value, an introspection on the current community consideration that in turn questions the values of the past, culture, and heritage. This highlights the poetic value and beauty of the island's landscapes and its local resources, glorifying the everyday Nevisian lifestyle. Not only does the exhibit reflect social issues, but it outlines potential responses, articulating social dialogue from the local to the global scale and reconnecting local issues with a broader view as a gateway.

Landscape and Museum beyond its Walls as part of an Ecosystem

The NHCS action plan met the government's new policy in training the taxi drivers and the touring guides in one single and credible discourse: the twenty-first-century Nevis history. This makes those private sectors into museum agents and presents the MNH museum as the gateway to a broad cultural heritage disseminated throughout the island—a place for socialization, personal development, and community gathering.

Semantic Concordance between Museological Intent and Technology Used

The laundry metaphor instigated by the used of wooden pegs to hang the exhibit panels puts an emphasis on the need to review the narrative of Nevis history, which undergoes a shift from "Plantation to Nation." Beyond the museological decolonization, the society needed to reform its economic model that is focused on the cruising tourists. Advised to include the locals, the museum became more authentic and socially inclusive, weaving all Nevis forces, such as the independent guides, taxi drivers, and hospitality sectors, setting a holistic and ecosystemic system. This disposition finds its mirroring effect in the use of smartphones. There is no difference between foreign or local visitors. Their points of view are both challenged by the multilayered information that takes them from renowned and assumed facts to revised historical facts. The technical shift allows the social and cultural change to be possible, ludic, and smooth.

Social Inclusiveness through Technological Conductive Education

For small museums, like MNH, the volition for change is real, but the challenge is in how to embrace the transition from a mass cruise tourist museum to a social museum when its economic viability relies on entry fees paid at 95 percent by the cruise tourism against 5 percent for the residents. This further becomes an issue as this is only during the peak season that lasts for only a few months. Since the opening of the *Enlivening* temporary exhibition, NHCS has won its challenge with an increase of 185 percent on revenue through entry fees compared to the same period during the year 2019. The percentage of tourists and residents is nearly half and half, with 51 percent to 49 percent in January 2020 with total revenue of 14,500 EC$ and 54 percent to 45 percent in February 2020 with total revenue of 17,436 EC$.

Based on the figures, we can state that Nevisians are much more enticed to visit the museum regularly. During the premiere in November 2019, visitors stated that they would need to come again to grasp all the QR codes and AR. The exhibition is more attractive and interesting than before, and they are learning so much from the traditional and digital displays that one visit is not enough, even if the one-room exhibition is only 80 sq. m.

Role of External Expert in the Museum Capacity Building

Lorna Abungu and Louisette Rasoloniaina approached the project as part of their corporate social responsibility, which could initiate the setup of an NGO or "museums without borders." The challenge was how to deal with what is available on the island and the resources in terms of volitions and donations. This mindset made a difference in terms of defining potential solutions, as it aimed to deal with what is physically and intellectually on the island and the constrained finances, creating a context calling for social inclusion and collective intelligence from the circle of staff, society, Nevisian communities, and beyond through a regional and international network of experts willing to contribute on the project success.

The local participants acquired so much knowledge and know-how that Almon Dason, a staff member, was able to advise teachers at a Nevis high school project on AR technology for a fair show to be held in Dubai. The school team learned from the MNH exhibition digital solution as an inspiring model.

Technologies

The smartness of *Enlivening* was the transformation of a disadvantage into an advantage. The lack of funds limiting the use of expensive high-tech means led the team to reverse the logic, exploiting the fact that most visitors own and carry high tech in their pocket or handbag: their own smartphones. After that, free apps downloadable through Apple or the Google Store enabled the team to achieve project goals. Therefore, it is not always necessary to use a paid solution in an open-source epoch with a lot of gratis solutions at disposal.

Nevertheless, the use of *Aurasma* became dramatic when the HP firm bought the platform, solution, and website; for a while, we could operate without any trouble until HP announced the redevelopment of their AR solution and closed the service, leaving free access to the existing auras and overlays. Since January 2020, only the smartphone app is still working. While MNH still benefits from this AR platform, until the museum gets the equipment and staff to create, manage, and store the auras and overlays, a paid externalized or internalized solution will have to be considered.

Reception, Reactions, and Further Potentialities

As part of the West Indies cruising aera, Nevis benefits from mass tourism, but with limited shallow dock facilities, it welcomes only the small cruise ships. This audience has been the main income source for the museums. NHCS had resentment following Lorna Abungu's advice in the necessity for social inclusiveness to do with and for Nevisians. NHCS was strongly convinced that its local biodiversity program was enough to serve the purpose. Eventually, the use of AR and QR codes convinced NHCS that both audiences could benefit from the technology and made their experience unique in the federation, if not in the Caribbean. The exhibition became a vivid agora where local visitors came back with acquaintances to discuss their findings through the multilayered information using their smartphones.

By January 2020, the news of COVID-19 had slowed down the number of foreign visitors, and soon, the growing number of residents visiting the museums attracted by the digital game-based approach made a difference. After the first wave, all efforts and plans were focused on involving local communities. COVID-19 made drastic social values transform.

Discussions

Museums as Part of a Social Ecosystem

If we had had more time, we could have exploited the video and audio archives of alumni interviews, stories, and musical or theatrical performances. This role of transmission—of connecting and correlating—is the role that museums take on. As a social museum, this

weaving of social and cultural ties places the museum in an ecosystem, expanding its role and ethos. In that vista, museum spaces, actions, and events must provide a buffering environment for the public to distance and differentiate their views from the official social and/or historical rhetoric to be sensitive to the notion of reinterpretation and reevaluation to be part of a consensus. Museums have become places of debate, of visibility for minorities, of questioning, of exchange, and of speaking out for communities and society.

New Vista for Museum Professionals on Their Praxis and in Regard to SDGs

The digital age has introduced the need for creating a new type of content that can be integrated by externalized experts, but as these two experiences revealed, the use of digital technology is an opportunity to empower museum workers to use their resources—their collections, exhibitions, programs, and expertise—to address the museum's sustainable development goals (SDGs). McGhie (2019) has determined seven major museum contributions to the SDGs: (1) protect and safeguard the world's cultural and natural heritage; (2) support and provide learning opportunities in support of the SDGs; (3) enable cultural participation for all; (4) support sustainable tourism; (5) enable research in support of the SDGs; (6) direct internal leadership, management and operations towards the SDGs; and (7) direct external leadership, collaboration, and partnerships towards the SDGs. Museums have a key role to play in UN SDG programs to put the world on a path to a sustainable future by 2030. McGhie's (2019) guidelines are intended to help museums, museum professionals, museum networks, and their partners contribute through the understanding of their place in the SDGs and how they can integrate them into their work.

Collateral Inclusiveness and Representation Shift

Setting a plan or strategy helped to realize that the NHCS' assets had constituted a solid ground for a more credible and ambitious action that was required to be completed through new conservatory and protection measures for further plantation houses, factories, windmills, and churches. In addition, it involved the estates, village, and parish communities seizing back ownership over the Sugar Cultural Heritage landscape as part of the heritage decolonization process. This participatory process completely changed NHCS' narrative and its expression form on how to display indoor and outdoor exhibits. The same logic applies to the use of digital technology. It makes museum and community involvement more "in" and connected to the local and global communities, making historical information accessible to many.

Museum Independence from Digital Technologies and Platforms

Enlivening was a short mission with little time allocated. A few videos were made by the team; therefore, we had to syndicate available resources on the internet through hypertext links. This syndication should be directed on other GLAM portals or platforms to set official rings and reinforce cultural heritage networks as much as possible.

An Effective Integral Digital Shift Leading to Museal Mastery of Digital Technology

In the gamification process, each architectural/urban element is defined as data objects. This classification is similar to the Heritage Building Information Modeling/Management (HBIM) object-based system, which opens the vista to a future possibility to set a Heritage Game Design (HGD) framework in articulation with heritage management by setting a new range of object property to enable a game engine to address the coded architectural/urban element into a game library. The ability to trace an object-lineage (class of object-family) can be used in the game concept as a simple false/true query. This simple idea exemplifies the ability of a paradigm shift

toward integrated management from HBIM to HGD and prospectively impacting more fields, such as heritage training and pedagogy.

The HGD should not require the modification of game logic to be suitable for the learning environment (Champion 2009). A plug-in or DLL (Dynamic Link Library) should be set in-between the digital tools for heritage management, gaming, and VR and AR industries that are inherited from the object-oriented programming and modeling that have been imposed on all sectors of activities, including cultural heritage. This causes a drastic shift to a systemic logic, if not ecosystemic.

On the systemic aspect, the digitalization of cultural heritage is an opportunity to set integral digital tool management from the HBIM to the HGD and much more. The apparent complexity of such settings should not prevent museums from embracing the potential digital offer by connecting all needs, optimizing work and management tools, and allowing the trained personnel to classify, use, and manage historical elements in their real and virtual settings with no disruption. In the future, it is hoped that projects like *Phantasmagoria* can directly use the HBIM file structure to call an architectural, urban, or landscape element into the game interface, exploiting all the available datasets (text, scan, map, 3D model reconstitution, etc.).

The conservation and restoration of historical monuments require a diagnostic analysis of a cultural heritage object carried out by a multidisciplinary team. This effort in digital processing, management, and data collection opened the opportunity for integrating other types of data like historical narratives and retrieved data from users' feedback, such as comments, observations, (re)interpretation, etc., which widens the representation systems for heritage knowledge, documentation, and usage (Messaoudi 2017). As per IT interoperability culture, the prevision of DLL can assure present and future exploitation of the 3D and textual data by digital game-based cultural heritage dispositive, aiming to create an interface pulling the player into the experience and allowing them to create a better understanding of the depicted historical period (Sweeting 2019).

Figure 28: From HBIM to HGD, an Optimized Heritage Digital Tool
Source: Rasoloniaina; Messaoudi 2017

Conclusion

Digital game-based cultural heritage can be only effective if the tools and the means (digital and non-digital) participate in the setting of global semantic coherency. In that regard, even though that objective appears to be an unconscious end result, the work segmentation through the hiring of multiple external experts focusing on one specific aspect of the project (the game designer, the scenographer, museologist, etc.) can disrupt the cognitive process that enabled positive results. Based on MNH findings, small museums with limited budgets have better chances to be successful than larger infrastructure unless they create their own game-based design division.

The *Gallery One*, designed by the firm Local Project and staged at the Cleveland Art Museums, illustrates that point; it was an amazing, striking, and high-tech demonstration of powerful digital means, but it overpowered the whole museographic setting by eclipsing the contents and the narratives. With maturity, this dichotomy should find a balance, and digital technology should be fully a part of the museological intent.

The use of the internet allows the edification of a coherent structure. It should not be only a source of resources but a platform to store, share, and diffuse the contents produced by the museums, stakeholders, and visitors. In that frame of settings, independence from private platforms and solutions is crucial. With the growth of the ecosystemic thought, the GLAM entities should create a ring of competency to share digital expertise trained to respond to the semantic, semiotic, and cognitive requirements since these digital tools are new language completing other media.

The use of the digital game-based approach is a people-centered way that makes the museum's actions, activities, and management part of the community. This approach's engagement embodies the sense of living heritage, renewing the museums and historical places and making them appear more attractive. This leads to an increase in the audience's involvement and diversity; the latter of which plays a major role in the making of the heritage reinterpretation and representation. This evolving dialectic augments the museum aura, making it an active social interface to echo the public and private stakeholders' interests and concerns and become an organic component of an ecosystem. However, for it to be successful, we need to reform the HBIM and game design ontologies to enlarge their connectivity, allowing a multipurpose usage of database hosting 3D and historical data as well as collected feedback from users, quizzes, forms, etc.

The immersion and pleasure felt by the visitors allowed for them to develop new behaviors and attributes, implying that an enlargement of the museum's scope enhanced the mission and services offered. The museum infrastructure should also grow accordingly and stimulate the development of creative internal or shared digital division among the GLAM ring. By being more ludic, the museum gains more efficiency on educational transmission; therefore, the museum continues its secular mission but also opens a new vista beyond its perceived walls, shoving its boundaries out of the physical environment. Its presence in the virtual world generates a ubiquitous entity accessible to the general and intergenerational public. Engaging with digital means will empower museum professionals and personnel to ensure narrative diversity and balancing museological intent over technology that is monopolized by a few experts selling technical and web platform solutions. Being digital savvy and literate will ensure museum discourse independence!

REFERENCES

Ariese, Csilla Esther. 2018. *The Social Museum in the Caribbean: Grassroots Heritage Initiatives and Community Engagement*. Leiden, NL: Sidestone Press.

Champion, Erik Malcom. 2009. "Game-Based Historical Learning." In *Handbook of Research on Effective Electronic Gaming in Education,* 219–234. Hershey, PA: IGI Global.

Davis, Peter. 2007. "Place Exploration: Museums, Identity, Community" In *Museums and Their Communities*, edited by Sheila R. Watson, 53–75. New York: Routledge.

Donlan, Christian. 2018. "Ancient History Shines in Assassin's Creed's New Discovery Tour—But It's the Gaps That Are Truly Thrilling." *Eurogamer,* February 13, 2018. https://www.google.com/url?client=internal-element-cse&cx=013820861241547739941:c8hropjf_rq&q=https://www.eurogamer.net/articles/2018-02-13-ancient-history-shines-in-assassins-creeds-new-discovery-tour-but-its-the-gaps-that-are-truly-thrilling&sa=U&ved=2ahUKEwjh0s23ue7wAhUKkxQKHXLTCGYQFjAEegQIBxAC&usg=AOvVaw2IlSj_FZsbusRJDV5CJmb5.

Farmer, Kevin, and Roslyn Russell. 2013. Plantation to Nation: Caribbean Museums and National Identity, edited by Alissandra Cummins. Champaign, IL: Common Ground Research Networks

Forrest, Regan. 2011. "Exhibition Costs—Constants and Variables." *Interactivate Blog,* July 21, 2011. http://reganforrest.com.au/2011/07/exhibition-costs-constants-and-variables/.

Hubbard, Vincent. 1998. *Swords, Ships and Sugar: A History of Nevis to 1900.* Corvallis, OR: Premier Editions International Inc.

Marinelli, Maurizio. 2019. "Domesticating Italy's foreignness in China: The Transcultural Politics of the Copy and the Real." In *Modern Italy* 24 (4): 417–436. https://doi.org/10.1017/mit.2019.53.

Marty, Paul F. 2010. "An Introduction to Digital Convergence: Libraries, Archives, and Museums in the Information Age." Library Quarterly 80 (1): 1–5. https://doi.org/10.1086/648549.

McGhie, Henri A. 2019. "Museums and the Sustainable Development Goals: A How-To Guide for Museums, Galleries, the Cultural Sector and Their Partners." *Curating Tomorrow*. https://curatingtomorrow236646048.files.wordpress.com/2019/12/museums-and-the-sustainable-development-goals-2019.pdf.

Messaoudi, Tommy. 2017. "Proposition d'une ontologie de domaine dédiée à l'annotation d'images spatialisées pour le suivi de la conservation du patrimoine culturel bâti" [Proposal of a Domain Ontology Dedicated to the Annotation of Spatialized Images for the Monitoring of the Conservation of Built Cultural Heritage]. PhD thesis, Arts et Métiers ParisTech.

Rapoport, Amos. 1977. *Human Aspects of Urban Form: Towards a Man–Environment Approach to Urban Form and Design*. New York: Pergamon.

———. 1994. "On the Invisible Architecture: An Environment Behavior Studies Perspective." In *The Invisible in Architecture*, edited by Ole Bouman and Roemer van Toorn, 1–8. London: Academy Editions.

Relph, Edward. 2019. "The Inconspicuous Familiarity of Landscape." In *Phenomenology of Real and Virtual Places*, edited by Erik Champion, 12. New York: Routledge.

Rössler, Mechtild. 2000. "World Heritage Cultural Landscapes." *George Wright Forum* 17 (1): 27–34. www.jstor.org/stable/43597660.

Salter, Chris. 2009. "Environments, Interactions and Beings: The Ecology of Performativity and Technics." In *Interfaces of Performance,* edited by Maria Chatzichristodoulou, Janis Jefferies, and Rachel Zehihan, 27–42. Farnham, EN: Ashgate.

Sweeting, James. 2019. "Authenticity: Depicting the Past in Historical Videogames." In *Transtechnology Research,* 62–83. Plymouth, EN: University of Plymouth. https://www.trans-techresearch.net/wp-content/uploads/2019/06/TTReader2018_WebVersion.pdf.

UNESCO (United Nations Educational, Scientific, and Cultural Organization). 1973. "Records of the General Conference, 17th session, Paris, 17 October to 21 November 1972, v. 1: Resolutions, Recommendations." Paris: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000114044.page=145.

———. 1992. "The Operational Guidelines for the Implementation of the World Heritage Convention (Revised), 24 to 26 October 1992." La Petite Pierre, FR: UNESCO.

Velvet, Nelson. 2011. "The Landscape Reputation: Tourism and Identity in the Caribbean." In *Tijdschrift voor economische en sociale geografie* [Journal of Economic and Human Geography] 102 (2): 176–187. https://doi.org/10.1111/j.1467-9663.2010.00608.x.

Venturi, Robert, Steven Izenour, and Denise Scott Brown. 1977. *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*. Cambridge, MA: MIT Press.

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The International Journal of the Inclusive Museum addresses the key question: How can the institution of the museum become more inclusive? The journal brings together academics, curators, museum and public administrators, cultural policy makers, and research students to engage in discussions about the historic character and future shape of the museum.

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