

# *Route of the Ελευθερία*: a Design Exercise for Museum-centric Entertainment Systems

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**Abstract.** We present a design exercise based on a previously presented theory to use digital games as part of museum experience. We show how, starting from exhibit analysis, game elements can be designed to promote museum contents and inform guiding systems about users interests and knowledge about the contents. Visiting and summarisation technologies can take advantage of this approach to maximise their impact on museum visitors. The methodology exemplified here will support future work to investigate on the field the basic elements described by the theory.

**Keywords:** Game design, museum promotion

## 1 Introduction

Interactive technology is generally considered to be a powerful *cultural amplifier* [3]. Its design, however, requires careful planning as it does not simply support learning processes but effectively alters the way these happen when compared to traditional means [5]. Also, the use of different technologies can influence specific characteristics of social learning. While interactive technology is indeed a powerful support for learning, motivating people to access cultural contents cannot be entirely delegated to the use of new electronic artefacts as the novelty effect alone quickly decays, as it has been demonstrated, for example, for social robots [4]. While being underestimated in the past, the use of games for cultural transfer has received an increasingly amount of interest in recent times. While the value of serious games for learning appears to be confirmed, the same cannot be said about their endogenous value: outside the learning environment, a serious game, being explicitly not designed to entertain, is less likely to be spontaneously approached. Results presented in [6] show that a serious game may be perceived as fun without being reported by the users as likely to be played in the free time. In the case of cultural heritage, this is a relevant aspect as the final goal, in supporting cultural heritage, is to stimulate people to spontaneously access it. People who have discovered identity-related motivations actually decide to spend their free time in the museum [2]. An emotional experience, built through the use of playful games, has the potential to create motivation to visit museums through

narrative and game experiences that, if successful, become part of a players' imagination. This work simulates the application of the theory presented in [7,8] to design museum-centric entertainment systems (MES), advocating for a game experience can be used to inform on-site intelligent systems about the visitor interests and in-game experience. Our method has the important advantage of integrating this possibility at design time.

## 2 Case study

In order to demonstrate the experience design process we are formalising, we will show how the basic principles presented in our previous work were used to obtain the pitch for a digital game to promote the Ma'agan Mikhael Ship exhibit at the Hecht museum in Haifa. The presented example was produced during the joint Italian-Israeli workshop on the Application of Novel Technology in Cultural Heritage held at the University of Haifa in December 2016 <sup>1</sup>. A MES experience design can be entirely supported by existing tools for narrative development. This is an important aspect as, other than offering specialised design tools, this kind of software usually includes testing tools to help identify narrative inconsistencies and test playability that can be used to verify the consistency of the designed experience. To produce this example, we used Articy Draft 2<sup>2</sup>.

### 2.1 Exhibit analysis

To start designing the game for the *Promoting* phase, we first identify the main theme of the game by selecting an exhibit to build the narrative around. In the Hecht museum, the main attraction is the Ma'agan Mikhael Ship so we concentrated on it. Known *facts* about the ship are selected among those that highlight the most important aspects of the exhibit:

- The ship sunk a short time after its launch (perhaps in its maiden voyage);
- The construction method of the boat is Cypriot and maybe related to the city of Dor (close to the sinking site);
- The ship is dated 5th century BC and is made of Aleppo pine. Only the tenons and the false keel are made of oak;
- The cargo of the ship included mostly stones for chiseling but also boxes in the shape of a heart, or leaf;
- Of particular interest was a set woodworking tools, as it testifies about the ship's construction methods;
- Other cargo seem to come from Cyprus but also from Greece: the chiseling stones are from an area near Athens. Remnants of food appear to originate from southern Turkey;

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<sup>1</sup> <http://www.cri.haifa.ac.il/index.php/crievents/2016/443-the-application-of-novel-technology-in-cultural-heritage>

<sup>2</sup> <https://www.nevigo.com/en/articydraft/overview/>

- The anchor is an important object as it testifies the use of one armed anchors in the ship’s age. The anchor is made of oak and has an almost completely corroded copper tooth;
- The food remains on the ship suggest that it sunk in summer;
- Relationship to Cyprus in the age of the Ionian rising may be used to create context. Cyprus contributed the Persian fleet invading Greece with 150 ships.

*Facts* cannot be altered by the narrative. *Blank spots*, on the other hand are useful to identify the missing pieces of information that can be filled by a narrative. In our case, these were the ones we considered:

- It is not known why the ship sunk;
- It is unknown if the ship had a name: the corroded anchor tooth may represent an opportunity;
- The route followed by the ship is not known but its cargo may be used to justify a hypothetical trip;
- Nothing is known about the ship’s crew.

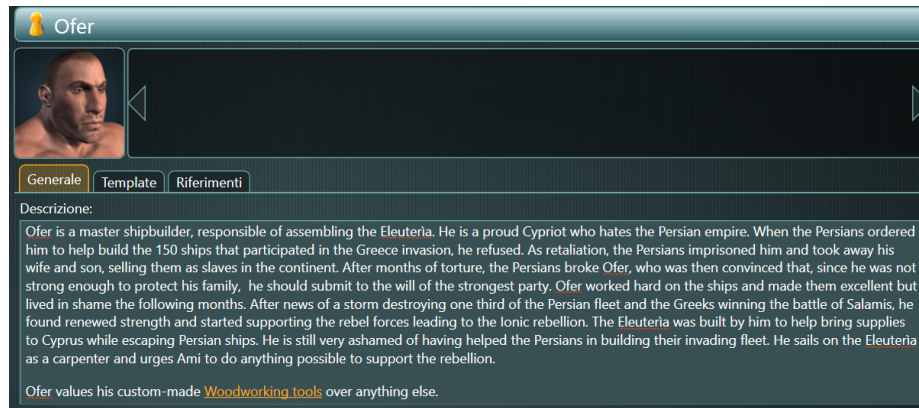
## 2.2 The game

Starting from this brief historical research, the pitch for a digital game can be produced. The general setup of the game was chosen to be seafaring on a reproduction of the ship. Being set in the age of Persian dominion over Cyprus, the selected theme of the game was the rebellious stance of conquered Cypriots during the Ionian risings. These led to the creation of independent reigns that were quickly recaptured by the retaliating Persians. To describe the game we define it in terms of gameplay, characters and narrative design. Concerning gameplay, reusing known mechanics from other games helps people who are used to playing games recognise the controls and get into the gaming experience more quickly. In our case, we want to have a strong focus on characters psychology and motivation to be able to depict rebellious Cypriots captivated by the Ionian risings. RPG mechanics like dialogue trees, inter-character dynamics and branching stories are therefore a straightforward choice to create the context and present it from different angles. The information collected while interacting with the characters can be tracked to adapt the visit. To put the ship under the spotlight, it is selected to be an explorable environment by itself and a *safe haven* in which to develop the relationship among the characters. The *safe haven* offers different chances to create emotional memories: it is usually inside it that important exposition through character development takes place, as the relationship between the PC and the companion NPCs deepens. Violating the safe haven is also a powerful strategy to create emotional memories: it is common to have enemies attack and even destroy the safe haven by surprise after the player has had time to associate it with a sense of peace and slowing down from the more action-packed moments. In our case, we chose to use the Ma’agan Mikhael ship as a safe haven to create a sense of attachment and affection towards it by the player. To do this, we first assign it a name to indicate that it is no common

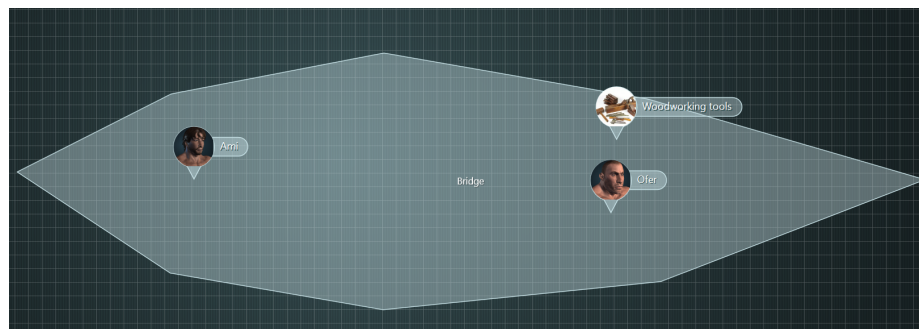
ship: given the chosen theme, we chose to name the ship Ελευθερία (Freedom). We take advantage of the corroded copper tooth of the anchor to hypothesise that the name was engraved onto it. To better define the ship, we make it a very fast one that can outrun Persian vessels. Since it is known that the ship sunk early in its life, the safe haven violation strategy can be used to create emotional memories and to introduce a surprise: a ship as fast as the Ελευθερία appears later in the game and, in the end, sinks it. This can also be used to expose an important narrative step and develop one of the main characters.

On the side of characters, we design a conflict relationship between the Playing Character (PC) and a main Non-Playing Character (NPC) to build the driving force of the narrative. The NPC is named Ofer and he is used to convey the Cypriot situation during the Ionian risings. Since the woodworking tools found on the ship are an object of interest, we highlight them by assigning them to Ofer and making them *his* tools. This helps build the character and gives the chance to discuss the tools during dialogue, assigning them an emotional value as a reflection of Ofer's affection. Ofer motives are also the driver of the narrative: his personal history is used to motivate most of the story advancement. Ofer grows in coming to put other people lives before his hate for the Persians to provide emotional feedback. He develops while revealing his backstory, which is designed to be strictly linked to the historical events of the ship's age and to objects of interest for the exhibit. The character object representing Ofer is shown in Figure 1. The PC is named Ami after the diver who found the ship in order to have a *fun fact* and stimulate discussion during summarisation. He is the young son of a merchant and desperately wants to command his own ship. Ami's desires clash with Ofer's charisma as the crew members still consider him as the leading person on board. Building and resolving this conflict represents the main drive for emotional moments to emerge. A character detail we can use to characterise Ami and deliver information relative to the ship's material is to have him like retsina wine: amphorae containing this particular kind of wine were sealed with resin from Aleppo pines, the same used to build the ship, and have a peculiar smell. As the Ελευθερία is meant to be a newly built ship, a reference to the smell of its wood helps extend the sensory experience, build curiosity and prepare the way for later discussion. The woodworking tools, linked to Ofer, are located with him on the bridge of the Ελευθερία. Location objects are used to describe areas and objects found in those areas. The safe haven, in our example, contains the main characters and the woodworking tools, as shown in Figure 2.

Concerning narrative, while RPGs are characterised by branching stories and quests, to keep this example simple we adopted a *pearl string* approach. The events sequence is linear and branching is limited to the dialogue trees but this can evolve in any narrative structure that support the concept of *critical path*: a main plot on which the designer has more control and a series of smaller subplots to create the illusion of freedom. The narrative designed for the Ma'agan Mikhael ship is divided into the following chapters:



**Fig. 1.** Character objects are used to keep track of the role NPCs have in the game. Their motivation, looks, statistics can be summarised through the available environments. In this case, The description of Ofer is linked to the woodworking tools object.



**Fig. 2.** Location objects represent objects locations. On the bridge of the Ελευθερία, Ami and Ofer with his woodworking tools are found.

1. It is a hot summer in Dôr, when a brand new ship arrives, led by Ofer. Ami convinces his father to appoint him as captain for a mission of bringing riches to the rebel kingdom of Salamis, promising to obtain deals with Cyprus;
2. during the travel, Ami gets to know Ofer and his motives. He becomes jealous of the crew's loyalty to the carpenter;
3. upon arrival at Salamis, the kingdom is attacked by the retaliating Persians. The Ελευθερία is forced to flee;
4. the Persians know about the mission of the Ελευθερία and start hunting for ship. Ami and Ofer travel to Greece to avoid being captured and buy merchandise to bring back to Dor, so they can disguise themselves as merchants;
5. in the city of Euboia, Ami and Ofer sell their precious cargo in order to acquire goods that will help support another rising in Cyprus;
6. Ami wants to show to the crew that he can act as captain and imposes a stop in Bodrum. There, Ofer is recognised by the Persian officer who forced

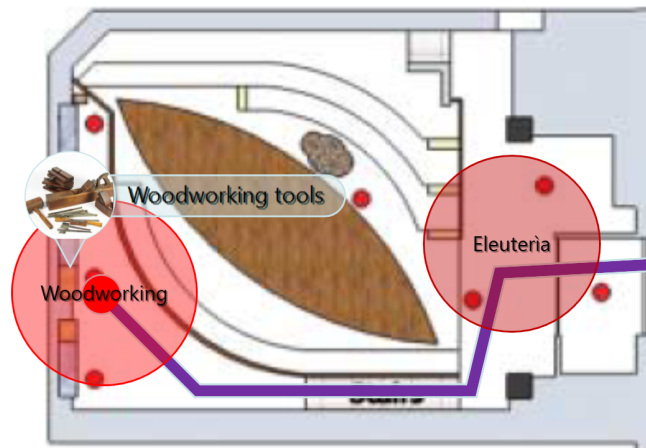
him to help building the Cypriot ships for the invasion. The Ελευθερία sails away, confident its superior speed;

7. as they approach Dor, they are caught on by the Persian officer, who is commanding one of the ships built by Ofer that survived the Greece invasion. The ship is as fast as the Ελευθερία and its crew more experienced. The Ελευθερία is sunk just before the coast of Ma'agan Michael. Before being killed, Ofer saves Ami by throwing him offboard.

The narrative structure is meant to deliver information while leaving information gaps on the background. Also, some informative content is covertly put into the story to be revealed during visit and summarisation. Chapter 1, for example, depicts the setting of a hot summer: this is historically motivated and the reasoning behind it can be capitalised during summarisation. Chapter 2 and all the situations in which Ami and Ofer can interact depict the Cypriot point of view towards the Persian dominion. It also creates the conflict between the two main characters that is intended to drive the rest of the story. Information gaps are opened as the Ionian risings are quelled and references to the failed invasion of Greece are mentioned during character development dialogues. Also, the historical value of the ship's cargo is not reported in the game although having the player interact with the cargo is part of the story. The narrative is also meant to justify the hypothetical route followed by the Ελευθερία during its voyage. The route itself, being hypothesised on the basis of the ship's cargo, can be used to explain, during the visit, why it is important to study such remains. Through the use of maps connected to the different chapters, the hypothetical route can help players familiarise with the geographical setting and with seafaring problems in the depicted age to connect geography to the narrative.

### 2.3 The website

Websites to advertise cultural heritage experiences tend to focus on the objects found in the exhibits. Ironically, this is not an effective strategy to stimulate commitment towards the visit. [2, p. 176] highlights that “[...] many museums build their websites around what they *think* it's important rather than framing the site around what the visitors might feel it's important”. Past research demonstrated that it is more likely that people choose to visit a museum because they perceive it as a place to satisfy the identity-related need of social connection and feeling of affiliation [1]. Designing a section of the website dedicated to the game allows the designer to advertise the experience players will have with a museum visit by showing objects of interest in the game context. Pictures of fictional characters associated to such objects with real people involved the picture are a powerful communicative instrument to symbolise the transition from the game environment to the real setting of the museum. In our case, associating images of Ofer near the glass protecting the woodworking tools or of Ami looking at the remains of the ship would be possible strategies to deliver the intended message.



**Fig. 3.** Location objects can be used to represent real venues, too. Linking the visit to data collected during gaming experience is possible through the use of pointers. Beacon areas are represented with trigger volumes and connect to object descriptions.

## 2.4 The visit

When on site, *echoes* of the gaming experience are used to evoke context through emotional memories. Location objects, in this phase, are used to describe the exhibit and the events that are linked to the game. Figure 3 shows the room in the Hecht museum where the Ma'agan Mikhael ship is found. From a design point of view, the woodworking tools positioned in the Hecht museum are the same ones presented during the story. Customised area trigger objects are used to represent the area of activation for beacons connected with additional content designed to support the human guide and enrich the visit. Woodworking tools are also found in this particular location: as described earlier, the reference is to the same object found on the bridge of the *Ελευθερία* to keep the design process clear. As an example of additional contents to be presented in this setting, 3D audio scenes can be played to describe the exhibit through the eyes of the game characters, thus involving the voice actors recruited for the game to produce the support material. This way, people who have played the game will recognise the characters voices and evoke the game context through emotional memories linked to them. People who did not play the game will simply listen to storytelling content, as previously done in the literature. During the visit, information gaps related to objects in the exhibit should be filled while the exhibit is presented. Some occasions, cover the material of which the ship is built, which can be emphasised by referencing to Ami liking the smell of Aleppo pine as it is close to the one of retsina wine. Presentation of the woodworking tools can be supported by referencing to Ofer's abilities while describing their use. Description of the cargo can be enriched by references to the route of the *Ελευθερία*.

## 2.5 Summarising

In the MES framework, the effort spent in stimulating discussion during the summarisation phase is supported by the process of revealing the interpretative key given by the designer to the exhibit. Producing *behind the scenes* documentary material allows visitors to strengthen the memory of the visit by getting an insight into the topic of the exhibit through the creative process that led to the game development. It is also an important step to make sure that fictional content is clearly separated from the historical one. Discussion among people can be stimulated in this phase by revealing *fun facts* and *easter eggs* and by describing the role objects of interest had in shaping the playful experience. In our case, presenting the design and production process of the game could make use of *fun facts* like the reason why the PC was named Ami and the game being set during the summer to provide discussion hints that are easy to remember and may stimulate word-of-mouth, which is one of the main, if not the primary, way for a museum to attract more people [2].

## 3 Conclusions

We have presented a design example showing the application of a theory for game design aiming at using games to promote and support museums visits. We have shown how, starting from the analysis of exhibits of interest, gameplay and narrative design can be designed to prepare users and to inform intelligent systems supporting the visit and summarisation phases. This technique will be paired with formal characterisations of museum visitors, on an affective basis, to support the development of the methodology. The approach is supported by existing tools for game narrative design extended to the entire visit experience.

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