

MuseLapse, a Serious Game on Museum Activities

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Abstract

This paper presents MuseLapse, a serious game for mobile devices about museums, their activities and the professional skills required to manage them. The player takes the role of a museum director who is presented with several proposals from her/his collaborators which s/he can either accept or reject. Each decision has consequences on three indexes related to the number of visitors, the conservation of exhibits and the scientific prestige of the museum. MuseLapse aims at making public more aware about museums and their activities and thus at increasing the interest towards these institutions.

Keywords

Serious Games, Museums, Mobile Applications,

1. Introduction

Museums are one of the most important institutions in our society. The reference definition used to describe the museum is provided by the International Council of Museums (ICOM)¹: “The museum is a permanent, non-profit institution at the service of society and its development, open to the public, which carries out research on the material and immaterial testimonies of man and his environment, acquires them, conserves them, communicates them and specifically exhibits them for purposes of study, education and pleasure”². The society’s transformations over time have been leading museums to renew themselves in their objectives, role, tools and professional skills. Museums are places in continuous evolution while ensuring the traditional functions as preservation, research and communication of collections.


Yet, visitors may not be completely aware of the complexity of the professional competences that are required to manage a museum, and even of the kind of decisions that need to be taken in order to maintain high standards in the quality of the visiting experience and in the scientific profile of the museum itself. Museum visitors are more likely to interact with personnel at the ticket office and with attendants in the exposition rooms or see the choices made by the museum curator. In this way, they may not recognize that a museum is much more than simply the place that contains exhibits, and that all the activities require specific competences.

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¹The International Council of Museums is an international organization of museums and professional museum specialists engaged in conserving ensuring the value of and maintaining the continuity of cultural and natural heritage value, current and future, material and intangible. For reference see <https://icom.museum/en/>

²It should be noted that a debate is underway within the organization for a new definition, for more details see [1] and [2].

Let us take as an example the design and creation of a temporary exposition of paintings. Clearly, the first step requires the competences of an art historian who selects the paintings to be displayed, but at the same time interacts with someone with managerial capabilities to organizing the borrowings from other museums and taking care of the transportation and insurance. The rooms need to be redesigned and prepared for the exposition, sometimes moving the existing collection, by an architect. The communication of the initiative, both on official and social media, requires additional professional competences that have a strong impact in the way the exposition – and the museum as well – is perceived. All these professional figures need to cooperate [3, 4], knowing that the requirements may be in contrast: an exposition that is appealing for a mass audience may increase the number of tickets sold, but at the same time may damage the scientific reputation of the museum.

The communication of the complex nature of their activities may raise additional interest towards museums, making these institutions closer to their public. We propose to address this issue through a serious game, knowing that playing is one of the most natural activities that people do throughout their entire life [5, 6]. Our approach is to let users know about managing initiatives by taking the role of the director of a fictional museum, who has to interact with different professionals and decide whether approving or rejecting their proposal, knowing that each choice affects the museum. The serious game is called MuseLapse and is designed as a mobile application.

2. Related Work

The relation between cultural heritage and serious games has been the subject of several researcher studies and projects. There are different approaches: the design of serious games applied to the cultural heritage with promotional, edutainment and educational aims; the proposal of methodologies that guided the design process of a serious game; user profiling within serious games, and so forth. In [7] it is proposed that cultural heritage applications can be divided in three groups: historical reconstruction, cultural events and virtual museums. The role of serious games about the promotion, the engaging and learning activities about archaeology heritage are deeper analyzed in [8].

The Sandbox Serious Game [9], a framework for developing serious games in cultural heritage, is based on the generalization of task-based learning theory. The model is designed to invite player to perform cognitive tasks while exploring information-rich virtual environments, especially in the case of images. Moreover, the work presented in [10] explores the idea that serious games can help user to achieve learning aims through a joyful experience.

A digital platform related to a social game for cultural heritage is HeGo [11]. In this case players are invited to send photos taken from an historical center in order to make a 3D reconstruction of that site. The Tsingtao Beer Museum (Qingdao, China) [12] is the setting of a serious game based on augmented reality, which was developed to promote visits and the follow-up purchases.

MuseUs [13] is a pervasive serious game [14] for museums where players are invited to create their own exposition during a visit. This approach allows the visitor to explore cultural heritage through different perspectives. In [15], the main aim is to create a serious game related

to cultural heritage that is accessible without restrictions in time or place.

In [16] five games were designed for a social network to promote a museum visit and to carry out a user profiling. A mapping study of applications of serious games in museums visits is presented in [17]. The perspectives of critical play and hybrid design in a playful museum experience are analyzed in [18], considering the collections of the Museum of Yugoslavia. In this case visitors can put themselves in the shoes of Tito simulating the creations of own cult of personality.

3. MuseLapse

MuseLapse is a serious game based on the simulation of a museum's management. The term *Muse* refers to the etymology of the term "museum" as the seat all the nine goddesses presiding the arts and sciences, while the term *Lapse* refers to the fact that, in order to prevent the museum's fortune to fade over time, the player has to make the right choices (with the help of some luck). The term *lapse* is also a clear reference to "Lapse: A Forgotten Future", a game that was the inspiration for our approach.

"Lapse: A Forgotten Future" and "Reigns"

"Lapse: A Forgotten Future"³ is a strategic game set in the future where the player is the president of an hypothetical Nation. In order to guide the Nation s/he interacts with a number of characters, represented by a deck of cards. Each character presents a specific request or a proposal to the president, who has to choose whether to accept or reject it. In both cases there will be consequences over at least one of the four nation indexes: environment, population, army and economy. The player's goal is to maintain, as long as s/he can, an equilibrium among the four indexes. When one index goes to zero the president dies, to come back to life and start again as s/he was in a temporal loop.

"Lapse: A Forgotten Future" is inspired by "Reigns"⁴, a videogame set in the Middle-Ages where the player is the king of a fictitious reign. Also in this case, the king has to make a number of decision about suggestions and requests made by her/his counselors. Both games are apparently easy to play, at least because a single *swipe* gesture is needed to proceed with the game, yet the player has to put in place a series of strategies to maintain a balance among sometimes conflicting goals. This is the core idea that motivated the design and development of *MuseLapse*.

3.1. Game Setting

In *MuseLapse* the player takes on the role of a director, who is responsible for the management of a fictional museum. During the game development, the player is presented with proposals from a number of characters, who represents different professionals working in real museums: curator, communication expert, education manager, and so on. Each character proposes an activity related to her/his domain of expertise. Because each activity presents potential benefits

³Lapse: A Forgotten Future: <https://play.google.com/store/apps/details?id=com.cornago.stefano.laps>

⁴Reigns: <https://reignsgame.com/reigns/>

and risks, the player has to decide whether to accept or reject it. The player's goal is to keep in balance three indexes that, in a simplified view, represent the main aims of a museum: to have a large number of visitors, to preserve the exhibits from deterioration, and to maintain high standards in scientific prestige. The game ends when any of the three indexes falls below a given threshold, which corresponds to the dismissal of the director.

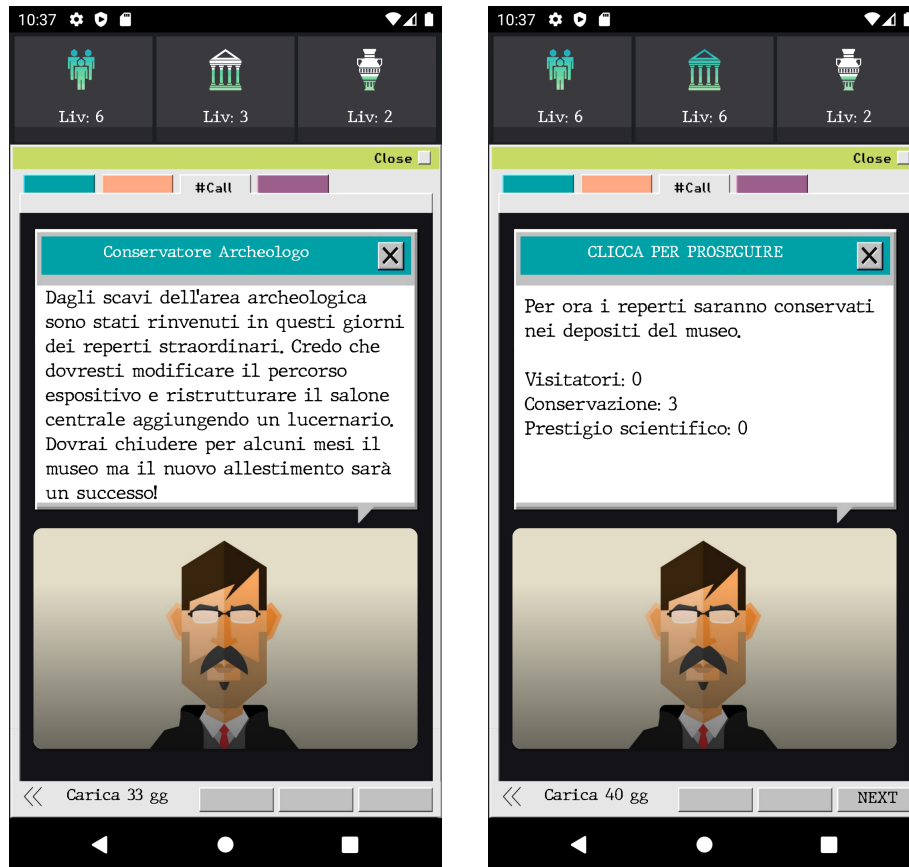


Figure 1: Example of a MuseLapse proposal with one possible scenario.

3.2. Scope of the Game

The aim of MuseLapse is to raise awareness on the fact that managing a museum goes far beyond handling visitors and taking care of the structure. Moreover this game aims to increase interest in museums and it focuses the attention on the careful choices to be made by a director between different objectives that are sometimes related and sometimes in conflict with each other. The player should understand that museums organize a number of activities, each one requiring specific skills and presenting a number of risks. These objectives influenced the design of the game, which includes a number of direct references – although largely simplified – of real life inside museums.

The serious elements are:

- The role of the museum *director*, reduced as a binary decision process.
- The museum *aims*, exemplified by three main indexes.
- A selection of *professionals* involved in the museum management with their activities.
- A sample of the *initiatives* that museums can launch.
- A set of *scenarios* corresponding to the different initiatives.

MuseLapse focuses the player's attention on the difficulties that the director and her/his staff may encounter in managing all the activities carried out by the museum, while interacting with cartoon-like characters in an easy and straightforward way.

3.3. Indexes for the Museum Aims

Three indexes summarize the museum aims and, as mentioned, the goal of the director is to maintain all three indexes above a given threshold by taking, at each turn, the most appropriate decision depending on the context. As it happens in a real situation, a choice may affect either positively or negatively (or not affect at all) the indexes. Indexes are:

- *Number of visitors* (icon representing people), which is the most obvious of the indexes and is related to the mission of *communicating* cultural heritage.
- *Exhibits conservation* (icon representing an amphora), which is an understandable but not obvious index and is related to the mission of *preserving* cultural heritage.
- *Scientific prestige* (icon representing a temple), which is perhaps the less known index and is related to the mission of *carrying out scientific research* on cultural heritage.

The game starts with all the three indexes at the same average level, although it is possible to apply a scaffolding approach for beginners by setting the indexes at their maximum level or even propose challenges by setting one index very close to the threshold (e.g., "Your duty is to improve the prestige without reducing the other two indexes"). In principle, each decision may increase or decrease all the levels, but some of scenarios may affect fewer indexes or even leave them unchanged.

3.4. Selection of Professionals

The player interacts with a number of professionals that, in MuseLapse, are represented by cartoon-like characters on a playing card and a text label. There are six professional figures in MuseLapse:

- *Conservator*: manages the conservation, security and valorisation of the collections' exhibit.
- *Curator*: designs and manages temporary exhibitions.
- *Registrar*: is in charge of the loan and handling artifacts services.
- *Communication expert*: organizes the communication of events and activities and takes care of the relationships with all stakeholders.

- *Marketing expert*: develops marketing and promotion strategies for the museum.
- *Education manager*: organizes educational activities for all audiences.

It is important to note that this selection is at the same time a simplification and an idealization. It is a simplification because it does not cover all the professionals that are involved in a museum management, although future releases of MuseLapse may easily include other characters without altering the game structure; it is an idealization because in many small museums few employees have to play all these roles, sometimes all subsumed by the director her/himself. We decided that selecting only six professionals and assigning one role to each character make the game simpler to understand. Thus any character is associated to a theme, which is correlated to her/his skills.

3.5. Defining the Scenarios

The result of each activity can be partially forecast by the player, but the way they affect the three indexes is non-deterministic, thus introducing some randomness in MuseLapse. This is a desired effect because on the one hand it can make the game more appealing for gamers attracted by *alea* and on the other hand it allows us to communicate more in detail which are the effects on the three indexes of undertaking initiatives. In any case, museums websites very seldom describe the effects of their initiatives and we had to envisage them anyway.

We decided that each activity can have five alternative scenarios, three related to a positive choice and two to a rejection, providing that even not acting has an impact on the museum indexes. As for proposals, also scenarios are in the form of a short narrative provided by the character who proposed the activity. Although they were created from scratch, all scenarios are plausible. Randomness influences the amount of variation of the three indexes, but does not twists their main effect. For instance, an activity that is expected to augment the number of visitors may have scenarios where the increase is either minimal or maximal, but the number is never decreased. Table 1 reports one proposal with all the possible scenarios and their effect on the three indexes. Figure 1 displays two screens of the game, with a proposal and one possible scenario.

4. Game Mechanics and Dynamics

MuseLapse is an *endless game* that at each turn presents a binary choice of whether accepting or rejecting a proposal. The game is designed for smartphone (at the moment only for Android devices) in portrait mode; the presented app is in Italian, but a multilingual support are possible for future versions. The player sees on the top part of screen the three icons representing the main museum indexes.

- *People* for the number of visitors.
- *Amphora* for the state of conservation of the exhibits.
- *Temple* for the prestige of the museum.

Table 1

Example of a proposal with all the possible scenarios and their effect on the three indexes: people for the number of visitors, amphora for the state of conservation of the exhibits, temple for the prestige of the museum.

Conservator: “I suggest to plan a retraining of the staff on managing the exhibits, strategic planning and organizing collaboration with other institutions.”	people	amphora	temple
ACCEPT: The staff training was successful. A constant update is essential to ensure that the museum is an “institution in the service of society and its development”.	-1	+2	+3
ACCEPT: We assessed in detail the tasks of each museum professional, but someone did not take part to the retraining, putting the collections care and the prestige of the museum at risk. Some measures have to be taken.	-1	-1	+2
ACCEPT: We understand that we need museum restorers! They are important for all preventive conservation activities. This lack entails many risks in terms of artifacts conservation.	0	-2	+3
REJECT: The museum performs many different functions which can only be performed by qualified staff. Refusing this opportunity, we will lead to a deterioration of museum quality standards.	+1	-1	-2
REJECT: Are you sure of your choice? I’ll propose the operators’ updates again soon.	0	0	0

The amount of colored part of the icon represents the value of the index. The numeric value is also reported under the icon. In the main part of the screen it is presented the card with the character, in a cartoon-like fashion. The characters communicate with the player via balloons, that are used for both describing the proposal and reporting the effects of accepting/rejecting it. The player can perform her/his choice by using the *swipe* gesture. A preview of the choice appears, in the form of texts saying “yes” or “not”, which the player has to confirm in order to let her/him possibly revise the decision. The bottom part of the screen displays the number of days in charge and provides buttons for advancing through the game. The player earns points at each choice, the more the three indexes are balanced the higher the amount of points.

4.1. Sampling the Initiatives

All the proposals made by the game characters are taken from real museum initiatives. This choice required a preliminary analysis of the recent activities at national (i.e. Italian) and international level. Starting from the museums official websites, we analyzed events, exhibitions, social campaigns and educational activities for different audiences. After selecting a number of potential activities, we assigned each one to the most related professionals and developed a short narrative in the form of a colloquial text to be inserted in a balloon above the character.

We have currently created twenty proposals for MuseLapse, evenly distributed among the six characters. Proposal may regard the organization of a scientific conference within the museum (by the conservator), the loan of exhibits for a temporary exhibition organized abroad (by the

registrar), the creation of a social game based on the collection (by the communication expert), the organization of a special event about dance in the early ages (by the marketing expert) and the launch of a yoga course inside the museum (by the education manager). All these activities have actually been organized by at least one real museum and published on its website.

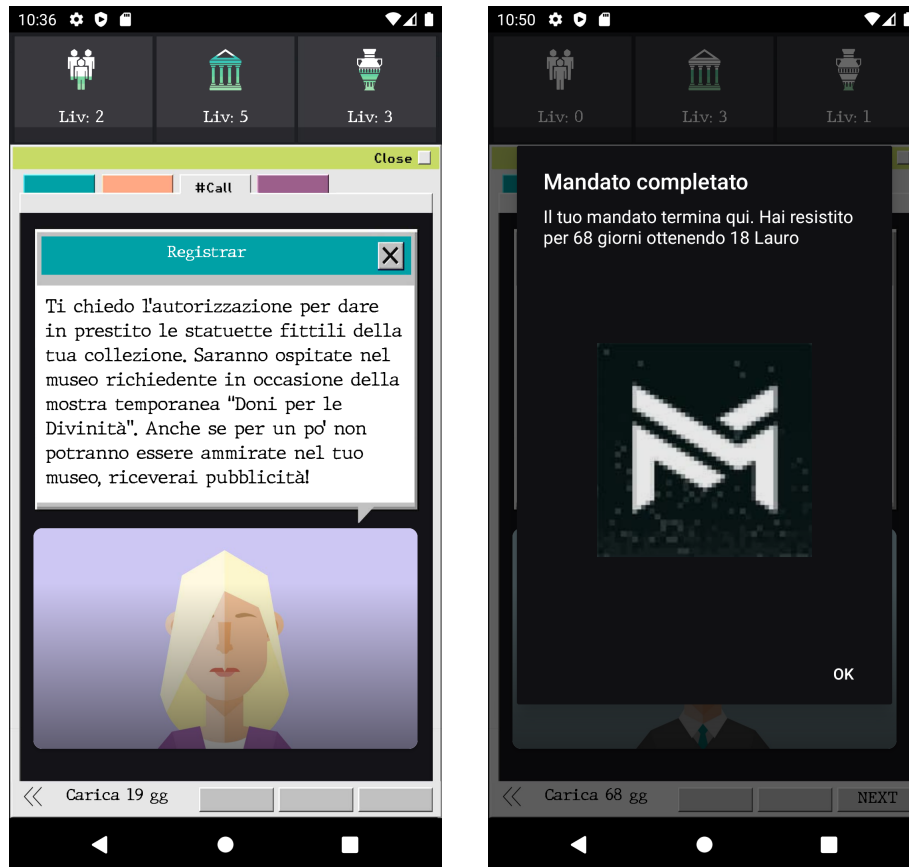


Figure 2: Example of a MuseLapse proposal and the end of game display.

4.2. The score

The player obtains the game culture points called *Lauro*. The name of this resource refers to as *Laurus nobilis*, or laurel, a plant that in Classical culture represented knowledge. The longer s/he maintains his role as museum director, the more Lauros s/he is able to get. So, the player earns points at each choice, the more the three indexes are balanced the higher the amount of points. Figure 2 displays two screens of the game, with a proposal and the end of game display.

In the current version, indexes have a range from 0 to 6, starting at 5, and each choice may affect them by summing or subtracting a value from 0 to 5. When an index goes below zero the game ends, corresponding to the director being fired. The value of the indexes is clipped to 6 even in case of very positive results of a scenario. The role of luck is modulated, because

scenarios are not equally probable. For instance, as it can be seen in Table 1, accepting a proposal can have a very likely scenario (the first), one less likely but still plausible scenario (the second) and a third highly unlikely scenario (the third) that makes the game more challenging.

The probability of these three scenarios is set accordingly to their likelihood and may change over time when the player improves her/his competences in gameplay. In this first version of the game the function that scores the number of Lauros obtained is linear and depends by the number of days on charge. We are going to evaluate a more dynamic score functions that takes care of the current level of the three parameters.

5. First Evaluation

A first qualitative evaluation of MuseLapse was carried out during the European Researchers' Night 2021, which was an international dissemination event, jointly organized by several universities and research centers in Europe. The University of Padua participates to Researchers' Night since the first edition, and the Department of Cultural Heritage has often presented new ways to access and disseminate the results of its research activities.

In this occasion we installed a beta version of the application in a set of mobile devices and make visitors able to try the game. Their aim was to obtain the maximum number of Lauros, maintaining the role of a museum director for the highest number of turns. Several people tried the game, both children and adults. Participants were able to play the game more than once, providing that there were enough mobile devices available. It is important to note that, in this particular occasion, the game was slightly modified. Since each participant might have a reduced amount of time to play the game, each proposal was presented only once, allowing her/him to complete the game without failing. In the standard version of game, each proposal can be presented several times because it may correspond to different scenarios, and thus MuseLapse is a true endless game. Anyway, only one participant completed the game without failing

We asked each participant to provide an informal feedback, in order to obtain first impression to adjust the development of the game. All participants found the game interesting and enjoyable, praising the idea of introducing the museum activities and their risks in a fun way. Some proposals and scenarios have been commented by participants, mostly when they recognized the similarity with personal experiences during past visits to museums. Some suggested to make the game more predictable, because the outcome of a choice are not always easy to forecast. To this end, we plan to add an indication about the possible effects of a single choice on the three indexes.

6. Conclusions and Future Work

This paper presents the serious game MuseLapse which, although being straightforward to play, is based on real cases and provides the player with relevant information on organization of the museum, the activities that can be carried out and their possible outcomes.

MuseLapse has been developed as part of a larger project called *Memo – The Memory of Objects* that aims at raising interest towards the problems of authentication of museum exhibits. One of the results is another serious game, called *FakeMuse* [19], where the player has the

role of a curator internship in a fictional archaeological museum with the aim to increase the exhibits collection. To accomplish it the player has to understand if a set of proposed artifacts are authentic or not. In addition to this main task, the player can read a sort of tidbits magazine and play with a set of minigames. One of these minigames will be MuseLapse that, besides being a standalone game, can be added to the economic resource system of the FakeMuse.

Future work will address a quantitative evaluation of MuseLapse with a larger set of real players. One part of the evaluation will be carried out through the analysis of game logs, in order to measure the length of each round of the game, the time required to make a decision and to refine accordingly the game mechanics. Additionally, we will analyze whether playing the game is entertaining or not and, at the same time, if it reaches the goal of raising awareness on the complex structure of museum activities and on the role of professionals. Questionnaires could be submit to players, in addition to the logs analysis, in order to assess this last issue. We are planning to add new characters that will not have an effect on the economy of the game in term of variation of the three parameters, but to make the game more engaging and to improve the game experience. Examples are the postman and the courier, which deliver some letters or packages, or an university professor that invite the director/player to a seminar or a congress. Finally, to make the rules game easier to understand we are planning to design a tutorial session in which player can understand the mechanisms of the game and its aims.

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