

Alma Mater Studiorum, Università di Bologna — Digital Humanities and Digital Knowledge,  
a.y. 2023/24 — Digital Heritage and Multimedia

Alma Mater Studiorum - Università di Bologna  
Master in Digital Humanities and Digital Knowledge  
Digital Heritage and Multimedia (I.C.)

Joust Day: Bentivoglio Challenge  
A gamified experience in Medieval Museum of Bologna

Design Brief

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November 2025  
A.Y. 2023/24

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# Introduction

## 1. The Context

### a. The museum and its content / collections



Figure 1: The museum's entrance Palazzo Ghisilardi Fava, Via Manzoni, 4

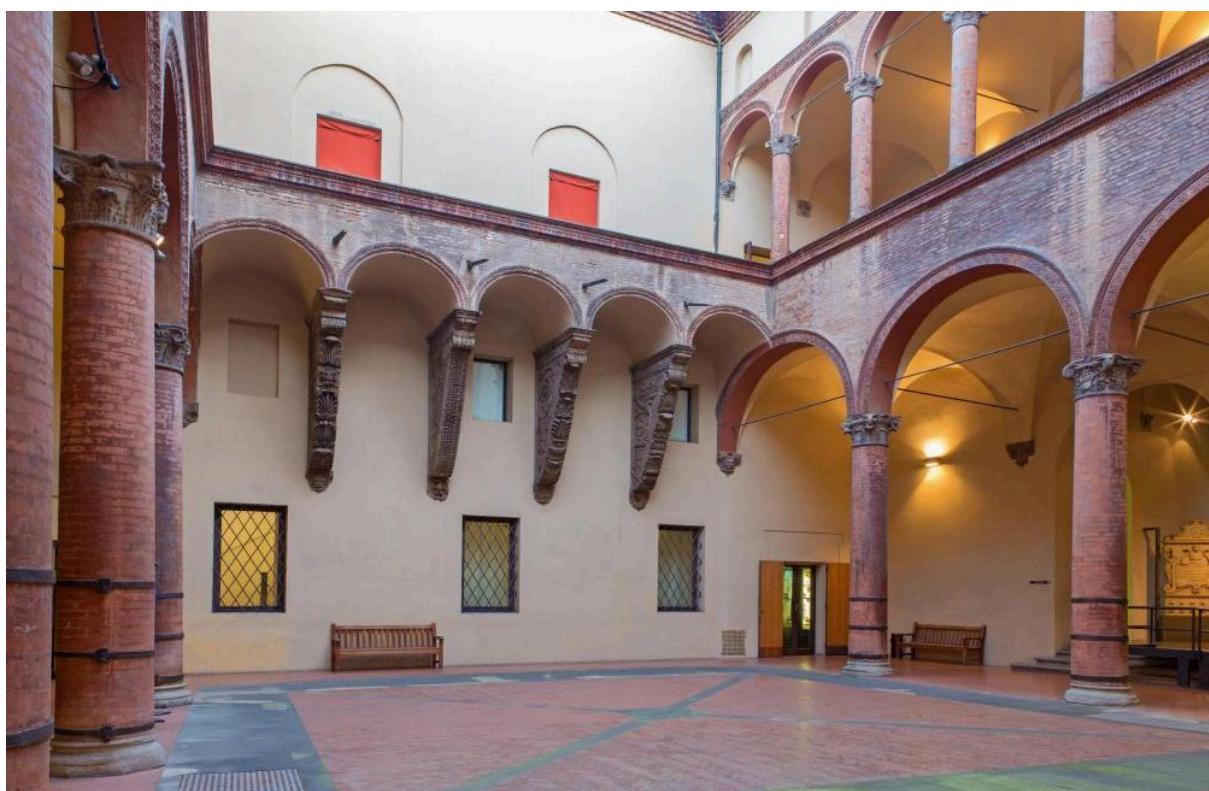
The Medieval Civic Museum of Bologna presents Bologna's medieval-to-Renaissance material culture: sculpture, bronzes, manuscripts, arms and armor, and civic university monuments (including Boniface VIII). The museum's core holdings come from Bologna's historic civic and scholarly collecting traditions, above all the Cospi cabinet of curiosities, the Pelagio Palagi bequest donated to the city in 1860, and the Marsili arms collection. These holdings are augmented by University collections.

Since 1985 the Medieval Civic Museum has been installed in Palazzo Ghisilardi(-Fava) on Via Manzoni 4, as part of the Musei Civici d'Arte Antica network of the City of Bologna.

From 2013 it operated within the newly created Istituzione Bologna Musei (a single governance body uniting the city museums). In May 2022 that institution was dissolved and governance reverted to the municipality as Settore Musei Civici Bologna.

Part of the museum's exhibition is devoted to military themes. Rooms 18 and 19 display weapons and armor from the Middle Ages and Renaissance. Among the exhibits, you can see classic Italian horse head armor, gilt-bronze rowel spurs, tournament armor and others.

## b. The location and its map/plan



*Figure 2: The museum's courtyard*

The museum sits in the historic center at Via Manzoni 4, Bologna, a short, porticoed stretch formerly part of Via Galliera, one of the city's main historic axes.

The museum occupies Palazzo Ghisilardi, a landmark of Bologna's Renaissance architecture. The Ghisilardi family consolidated properties here from 1400. The current residence was commissioned by the notary-humanist Bartolomeo Ghisilardi and built in 1483–1491. The complex incorporates a medieval tower and even earlier structures, such as fragments of the Selenite walls and the imperial Rocca. Over

time it passed to other owners, became a Casa del Fascio in the 1920s, then state offices after WWII. Restored by the city, it reopened as the Museo Civico Medievale on 4 May 1985.

The museum's permanent collection spans Late Antiquity, the Middle Ages and the Renaissance, with highlights presented across numbered rooms.

Themes include the funerary monuments of the University doctors, a renowned gilded-copper statue of Boniface VIII, the "Piviale di San Domenico", ivories, and the substantial arms and armour collections.

Rooms 18 and 19, where most of the weapons and armor are displayed, are located on the fourth (top) floor.



*Figure 3: Layout of the 4th floor, where rooms 18 and 19 are located*

## c. Institutional Goal

The Medieval Museum of Bologna conserves, studies and presents Bologna's medieval-Renaissance heritage, such as arms and armour, sculpture, manuscripts, ivories, manuscripts and others. This way, the city's past can be understood, taught and enjoyed today. The museum's work follows the five-year Integrated Strategic Plan (2025–2029) for the Civic Museums<sup>1</sup>, which orients every venue toward four macro-objectives: civic activation, public health, sustainable finance, and smart cultural tourism, and six strategic axes: innovation, social value, sustainability, participation, collections, networking. In practice, this means widening access by creating programs for diverse and fragile audiences, including "Cultural Prescription" for wellbeing, investing in digitization and a Digital Library to share knowledge, and experimenting with "phygital" communication and co-created displays.

## d. Cognitive Goals

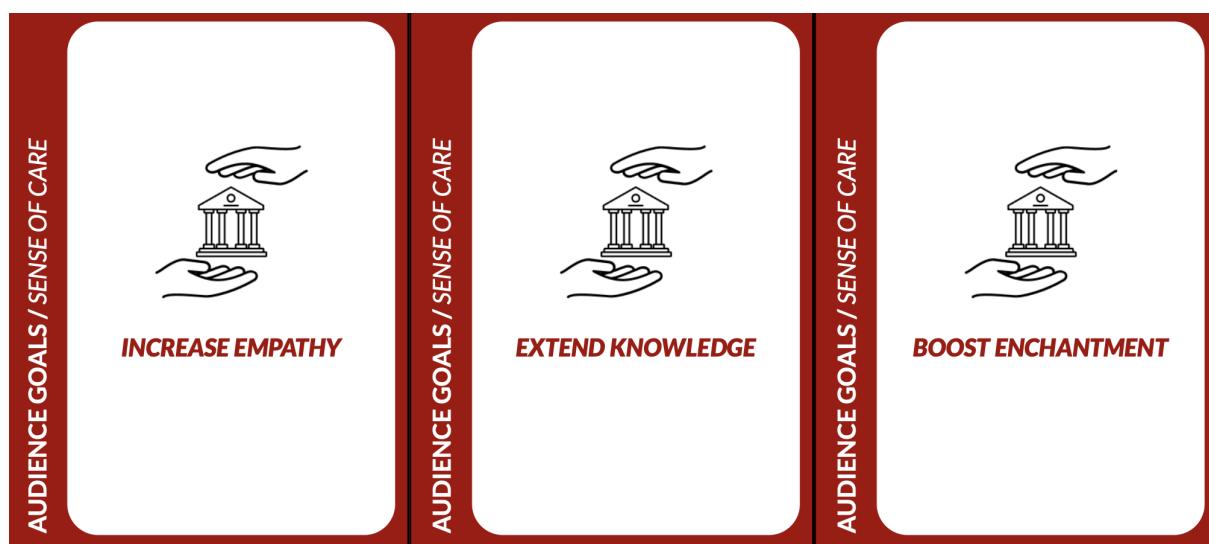


Figure 4: Cognitive goals (visitorbox cards)

Three main goals of this project is extending knowledge, boosting enchantment and increasing empathy.

Boosting enchantment is achieved through making the Middle Ages vivid and attractive by turning objects into tools in a mission. Students find out armor, spot and read heraldic symbols on weapons, and hear light ambience (forge, hoofbeats). Short wins and "aha" moments keep their curiosity high. This happens through the following compelling narrative thoroughly visualized. After each task, a player

<sup>1</sup> <https://www.museibologna.it/schede/piano-strategico-integrato-3542&preview=4830&lang=it>

receives feedback that reinforces his understanding of the topic. Solo or group play keeps the challenge light and replayable.

As for extending knowledge, learners, going through this experience, deepen their understanding of medieval knighthood, especially tournaments. They learn what a tournament is, why the armor's left side is reinforced, what the lance rest and stirrup-shoes do, what a cinquedea is and how mottoes worked in medieval culture. Knowledge is acquired by progressing through the experience's storyline, during which the player gradually discovers new artifacts.

Empathy increases due to role-playing a squire putting students in someone else's shoes on tournament day. They feel time pressure before the tilt, the trade-off between safety (more armor) and mobility (lighter gear), and responsibility toward rider and horse under tournament rules. Empathy grows as they choose gear with visible consequences, and answer the questions that frame decisions as their own.

### e. Star Assets (must-see of the museum)

The Armoury is one of the museum's main draws. Room 18 gathers armour, corsaletti, pole-arms, cinquedea dagger, swords and other weapons. Room 19 continues with the European set, including horse furniture, throwing weapons and firearms, while Room 17 presents Bentivoglio pieces (stocco and targone) and Room 20 focuses on Ottoman arms.

Dominating Room 7 is the famed figure of Pope Boniface VIII, an emblem of papal theocracy and one of the museum's signature works. It anchors a gallery that introduces Bologna's late-Duecento/early-Trecento art.

The city's legal culture is presented by the monumental tombs of the University jurists. Special attention should be paid to a refined collection tracing ivory working from the Gothic to the Baroque, spanning devotional objects (portable altars, diptychs, crucifixes) and secular artefacts (mirror-covers, combs, salts), alongside works from Africa and Latin America reflecting early-modern exchanges.

The following exhibits were selected for the "Joust Day: Bentivoglio Challenge" experience.



Figure 5: Jousting armour (1560 ca.)

Originating from the historic Cospi collection, this is the museum's most significant defensive ensemble. It is a purpose-built tournament armor for the regulated joust in which two riders, each keeping the dividing barrier to their left, charged with lances. Because the opponent strikes from that side, the left flank is specially protected: the helmet is stiffened on the left and the left elbow is reinforced. On the right breast sits the lance rest (resta), a sturdy metal hook that supports the weapon on impact. The gauntlets are unmatched: the left is shaped for holding the reins, while the right is optimized to stabilize the lance. The rider's feet fit into staffoni, integrated shoe-and-stirrup units that lock the seat, helping the knight remain in the saddle when absorbing a blow.



*Figure 6: Cinquedea with Bentivoglio motto  
(End of the XV c.)*

The cinquedea (literally “five-fingers,” from the blade’s width near the hilt) is a short sword-like dagger whose very broad heel at the junction with the guard tapers rapidly to a point. This example belonged to a member of the Bentivoglio family, very likely Annibale II, as indicated by the family coat of arms and the device of the eagle with the Latin motto “NUNC MICHI” (“now it is my moment”) engraved on the pommel and hilt. It is a luxury weapon, richly finished with inscriptions and allegorical scenes cut into the fullers, the shallow grooves on the blade. Although scholars have not fully decoded every scene, the imagery clearly echoes chivalric themes of fury, fortune, and virtue familiar from heroic literature. A hallmark of Bentivoglio-era taste is the iconography and Latin mottoes that deliberately “look to antiquity”, turning the dagger into an “epic” object that evokes the arms of ancient heroes.



Figure 7: Horse-head armor (1520 — 1530 ca.)

This testiera, a protective headpiece for a war or tournament horse, is a classic example of Italian foundry work. Forged in a narrow, almond-like profile, its central zone is decorated in tortiglione, which is a twisted, spiral pattern. The headpiece is made in one integral assembly with the ear guards, eye cups, and the cheek plates, aligned with the horse's cheeks. At the center sits a rosette that holds a plume. On typological grounds, this testiera can be understood as the head protection used together with the jousting armor displayed in Room 18.



*Figure 8: Parade Saddle (1440 ca.)*

This parade saddle, popular in the German lands, France, and northern Italy, is called “alla moscovita” (“Muscovite style”) because its unreinforced seat ends at the back in two inclined, wing-like flaps instead of a high continuous cantle. The wooden core is veneered with carved and painted ivory, turning the saddle into a showpiece. The decoration follows courtly and chivalric themes: a gentleman and a lady in contemporary dress, and a German inscription reading “I do not rejoice; better tomorrow than today,” a proverb-like line that suggests restraint and hope for improvement.

## f. Target Audience

The target audience is middle school students (ages 11–14) who learn best through short, hands-on activities, clear goals, and immediate feedback. They bring uneven prior knowledge and varying reading levels, but strong curiosity for visual, interactive tasks they can complete quickly, alone or in group. They expect school trips to feel different from classwork: more doing than reading, simple language, and chances to

succeed without being put on the spot. They value light competition, but also need low-pressure options and accessible design (large touch targets, audio off/on, brief texts). “Joust Day: Bentivoglio Challenge” fits them by offering a focused, game-like path that maps directly to curriculum topics while staying playful, tangible, and inclusive.

## 2. The Audience

### a. Motivations

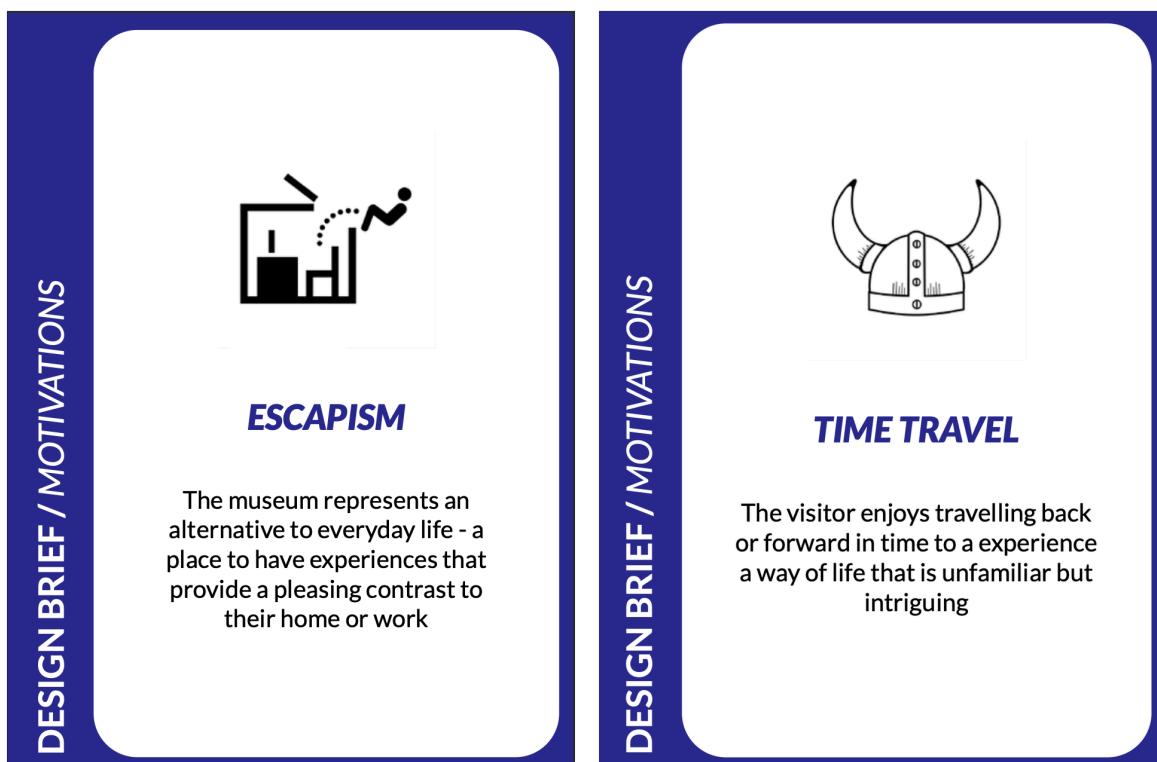


Figure 9: Motivations (visitorbox cards)

Two important motivations that may arise for the target audience to participate in this experience are desires to travel through time and by doing this to escape from the boring and monotonous routine.

“Joust Day: Bentivoglio Challenge” lets students step into late-medieval Bologna for a few minutes. They play as a squire on tournament day and make simple, concrete choices. Short on-screen notes and period sounds (forge, crowd, hoofbeats) build the right mood, immersing participants in the atmosphere of medieval Bologna. Each action links directly to a real object in Rooms 18–19, so after the game students can

spot the same armor part or symbol in the display. In this way, the past feels close, understandable, and connected to what they see in the gallery.

Many middle schoolers crave escapism because their day is tightly scheduled and performance-focused: frequent assessments, rigid routines, and crowded, noisy spaces leave little room for students to choose what to do, how to do it, or at what pace. Social dynamics which are manifested in being watched, fear of “getting it wrong,” friendship tensions add pressure. Reading loads can feel overwhelming for uneven skill levels, and the gap between what they like (hands-on, visual, game-like tasks) and what they often get (long texts, passive listening) creates boredom and avoidance. This naturally gives rise to the need for a brief, safe place to be someone else.

“Joust Day: Bentivoglio Challenge” meets that need by offering a short, self-contained mission that feels different from classwork. Students step into a squire’s role, act with clear goals and instant feedback, and earn a small badge as a reward. The proposed tasks are bite-size, tactile and reduce load with reading while keeping thinking active. The design is low-pressure with opt-in audio that transports without overwhelming. Crucially, the fantasy re-anchors in reality: each win points to a real object nearby, so the “escape” becomes curiosity that carries back into the gallery.

## b. Barriers

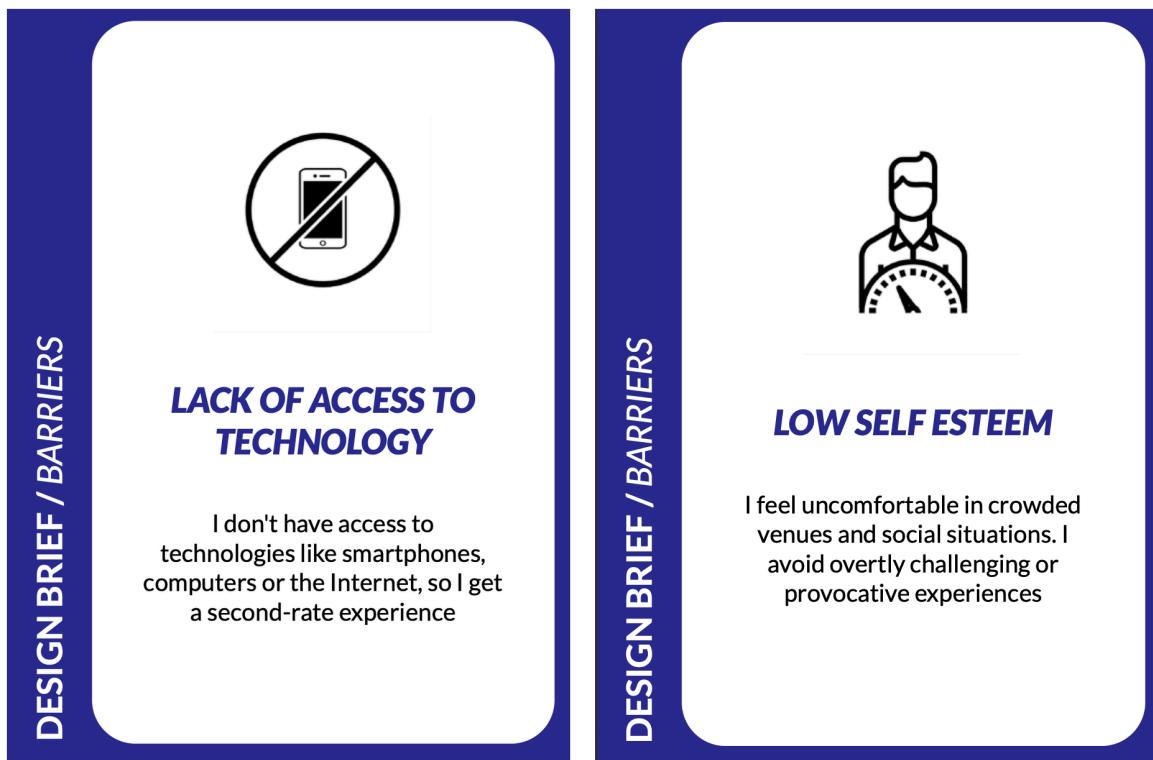


Figure 10: Barriers (visitorbox cards)

Some potential barriers to consider when designing the experiment include lack of access to technology and low self-esteem among some students.

Some pupils don't have a smartphone, data plan or a home computer. Our solution is the kiosk-first design of the “Joust Day: Bentivoglio Challenge”, it runs fully offline on a museum tablet with local media, so there is no need for log-ins, accounts, or internet. Every interaction fits on a single large screen. For classes, one device can serve small groups, a facilitator-led mode projects the game while students decide choices together.

Some pupils avoid overt challenges and feel uncomfortable when they have to solve a problem in front of other students. The game supports solo, quiet play with short, forgiving tasks, no timers by default, and gentle wording (“Try another fit” instead of “You made a mistake!”). Hints appear progressively and difficulty never spikes. A non-competitive track ensures a win-win pointscoring. Thus, by the end of the experience, the player will receive the maximum number of points and be declared the “winner”. The UI allows pause of any mini-task and offers headphone-friendly ambient audio with volume toggle.

## c. Capabilities

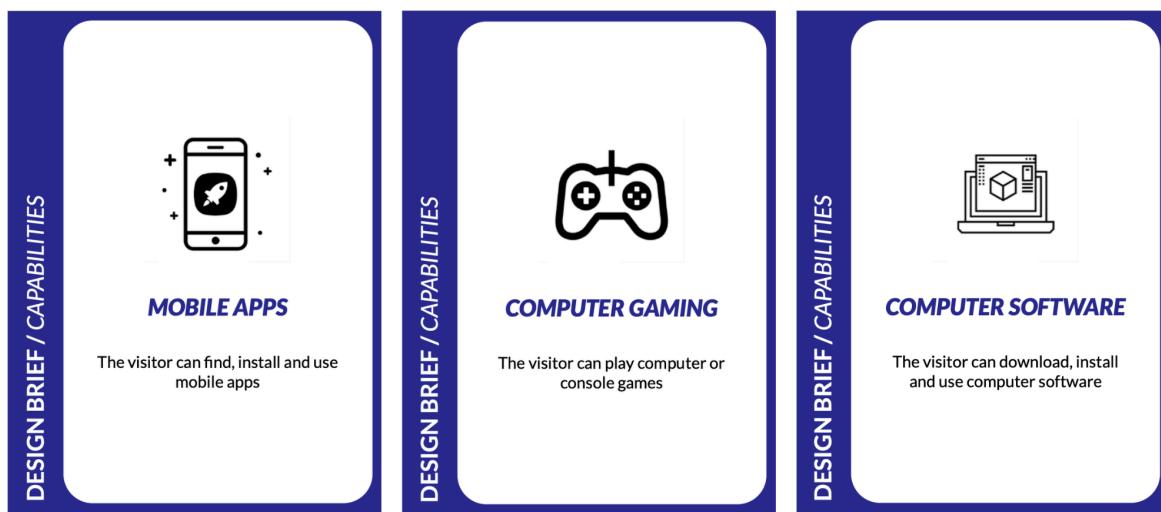


Figure 11: Capabilities (visitorbox cards)

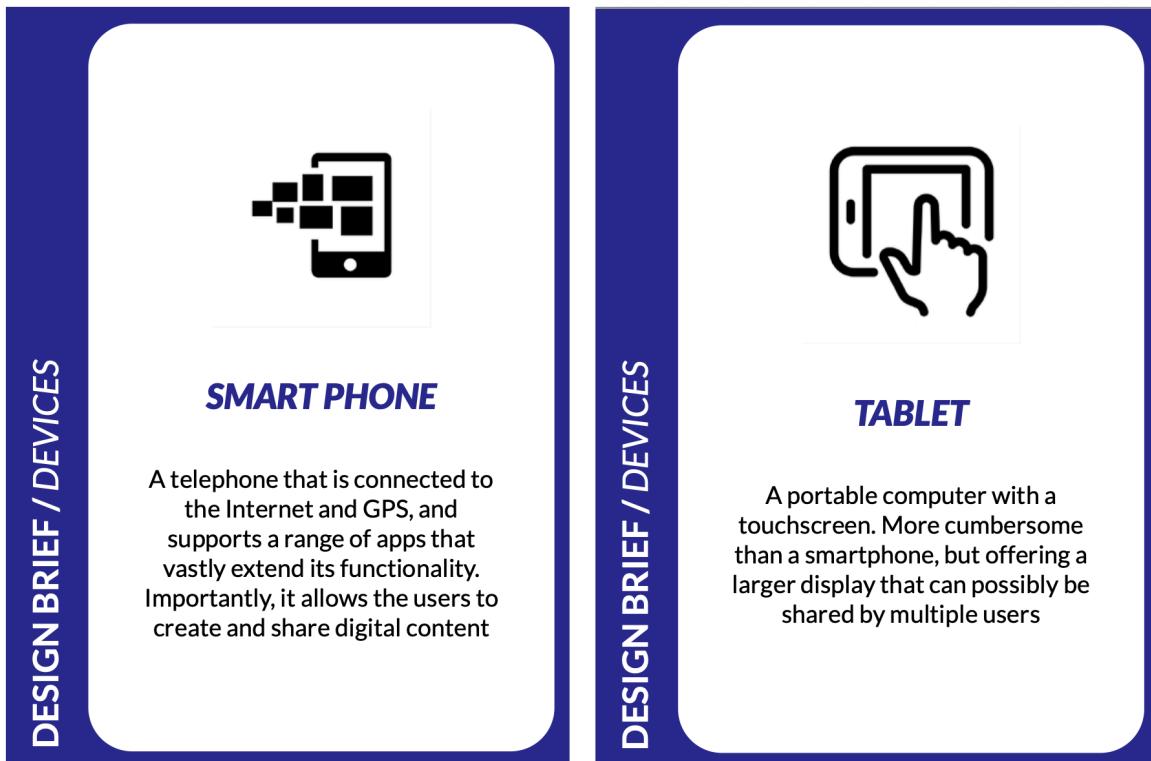
To make the most from the experience, we plan to use the following technologies: computer gaming, mobile apps and computer software.

A short, goal-driven mini-game (“Joust Day: Bentivoglio Challenge”) with familiar patterns (levels, hints, achievement badge) make the museum experience more interesting for the young visitors. Players assemble the knight’s gear, read a short motto on the cinquedea, immersing in the atmosphere of chivalry.

The experience should be accessible through a mobile-friendly web (no install required) and, if desired, a lightweight PWA so teachers/students can “Add to Home Screen” for offline replay.

It should be also offered to the visitors an optional desktop package bundling the same experience for classrooms without stable internet, plus a Teacher Pack (PDF) with answer keys and discussion prompts. Educators download once and run locally for group play or homework preparation.

## d. Devices



*Figure 12: Devices (visitorbox cards)*

The implementation of the experiment involves the use of devices such as tablets, and smartphones.

Students are comfortable with touch-first tablets in landscape mode. The experience runs well in kiosk settings: large tap targets, simple gestures (tap, drag), and quick onboarding. Tablets support shared play, headphones for audio, and offline/PWA use. So this type of device is ideal for short, teacher-supervised sessions without log-ins or typing.

Most students carry smartphones and can scan a QR code to continue the experience after the gallery visit. They handle portrait layouts, short text, and quick interactions. The build prioritizes readable typography, one-hand taps, vibration cues, and audio with a mute toggle.

### 3. Concept

#### a. What are the specific problem/s you are facing with your project?

The main problem addressed by this project is how to attract children's attention to history, in particular to the history of medieval Bologna. To be even more precise, the aim of our project is to make visiting rooms 18 and 19 of the Medieval Museum of Bologna more interesting and exciting for schoolchildren.

Historical museums often make pupils feel bored. For them, the exhibits on display are usually just incomprehensible artefacts from a reality that has practically nothing to do with the one they live in.

#### b. How will the project face the problem/s?

In order to overcome children's indifference or even rejection of museum exhibits, it is important to link these exhibits to vivid and exciting stories. Stories with simple but engaging plots and characters that children can relate to will always resonate more with them than mere retellings of historical facts.

Giving children the opportunity not only to listen to these stories, but also to participate in them, is even more likely to attract their attention to the museum and the topic being covered in it. Deciding for a character pulls students "into" the story world. They start to care about outcomes, which heightens attention and makes details, such as names, objects, places stick. Another important factor that makes storytelling a good way to engage children in a particular historical topic is that narrative branches break content into small, meaningful steps, reducing overload while maintaining challenge.

Tablets installed near exhibits should make storytelling even more engaging by visualising story and providing schoolchildren with a gaming experience.

#### c. Museological approach

This project, designed to make school trips to the Medieval Museum of Bologna (specifically to rooms 18 and 19) more exciting, is conceived with the current ICOM

(2022) understanding of what a museum is and does. In this view, a museum is not just a display space but a public-oriented, inclusive, and participatory institution that researches, preserves, interprets, and communicates tangible and intangible heritage, fostering education, enjoyment, reflection, knowledge sharing, diversity, and sustainability.

Applied to rooms 18 and 19, the project treats digital interpretation as a way to enrich the museum experience. The “Joust Day: Bentivoglio Challenge” uses storytelling and light gamification to invite students and families into the logic of medieval life: preparing a knight for a rincontro, reading a Bentivoglio motto on a cinquedea, understanding how a testiera protects the horse, and learning about what a parade saddle is. This approach answers ICOM’s emphasis on communication and community participation by offering accessible, low-pressure, multilingual micro-activities that can be used by different audiences and learning styles.

Crucially, “Joust Day: Bentivoglio Challenge” amplifies the visit by making each digital action point back to a specific showcase detail so that the object remains the star. Arms and armor, inscriptions, and gear often require context to be fully understood. The narrative connects separate fragments of exposition into a coherent whole. In short, the project helps the Medieval Museum act as a laboratory of knowledge, where the city’s medieval heritage is not only preserved but actively explored, shared, and re-imagined with its communities.

The exhibits of rooms 18-19 were selected in such a way as to cover various aspects of knightly culture in medieval Bologna on the one hand, and to preserve the coherence and integrity of the narrative built around these exhibits on the other. Information about the selected objects was primarily taken from the descriptions of the halls available on the museum's website.

#### d. PW case study: themes and topics

“Windsor Castle. Bring on the Battle!” is a free online interactive game set in the medieval past of Windsor Castle. It is developed by Royal Collection Trust and designed for children and families, it can be played on a web browser from anywhere. The game is played from the perspective of a soldier attacking or defending Windsor Castle. As the story unfolds, the player tries archery, dodge burning oil and learns who built the castle, why and how. “Windsor Castle. Bring on

the Battle!” uses a story-driven quest with skill challenges (aiming a bow; avoiding hazards) and progress feedback.

“Clay through the Ages” is developed by The Hunt Museum in Limerick, together with Limerick Museum and the City Gallery. This gamified experience is designed for primary school children (roughly ages 6–12). The experience is a playful treasure-hunt through a map of Limerick inspired by a 1578 illustration, guided by Truffles the pig. Each completed level unlocks a ceramic “treasure” from the partner museums. Kids explore a late-medieval city layout and connect objects to place. The “Joust Day: Bentivoglio Challenge” experience combines some features of both of these cases. The role-playing model implemented in “Windsor Castle. Bring on the Battle!” forms the basis of our game, in which the player acts as a squire on tournament day, making practical choices and decoding heraldry.

As for borrowings from “Clay through the Ages”, each solved micro-challenge pops a “Feedback” card tied to a real exhibit, mirroring the mentioned game “unlock a treasure” mechanic.

In sum, “Windsor Castle. Bring on the Battle!” grabs attention through combat/knighthood role-play, while “Clay through the Ages” sustains it through map-based discovery and artifact rewards. Joust Day combines these strengths: first-person game + unlockable object insights anchored in the Medieval Museum of Bologna’s Rooms 18–19.

## 4. Requirements

### a. Must

The key task of our project is to create an engaging narrative that will captivate children and teenagers.

In addition to being engaging, this narrative should also be educational, i.e. it should include some historical information that will allow schoolchildren to broaden their understanding of the Middle Ages in general and knighthood in particular.

### b. Should

In order to increase the inclusiveness of the proposed experience, it should be made available in different languages.

It is also important to ensure that schoolchildren who are going to participate in this experiment are provided with a museum curator who would explain to them how the game works and would be ready to answer any questions they might have about the game and the history of the Middle Ages as represented in the museum exhibits.

### c. Could

In order to enhance the immersiveness of this experience, it would be reasonable to make it possible to play the game using augmented reality technologies.

Also, for those who are interested in the exhibition and the historical material covered in the game, it would be good to create a more detailed version of the game, including narratives about more exhibits.

### d. Won't

Since the experience revolves around the theme of weapons, it is important to take particular care to ensure that the game does not romanticise war and weapons.

When developing the experience, it is also important to pay special attention to ensuring that the proposed it does not distract attention from the actual museum exhibits, on the contrary, this experience should help young audiences become interested in the exhibits and the stories associated with them.

## 5. Ideation

### a. User Experience

The “Joust Day: Bentivoglio Challenge” gamified experience has been developed for rooms 18-19 of the Medieval Museum of Bologna. The aim of this experience is to increase young museum visitors' interest in the exhibits on display and, more generally, in the history of medieval Bologna. This game was designed using the Twine program and is intended to be played on tablets specially installed next to the relevant exhibits.

Visitors enter Room 18, where they listen to a teacher or tour guide talk about the exhibits on display. After listening to the talk, visitors approach the first tablet installed in the same room. The teacher or tour guide briefly explains the mechanics of the game, then users begin playing. The first (introductory) part of the game introduces players to the story and familiarizes them with the main character. The plot of the narrative is the following: Pietro, a squire who entered the service of Signor Annibale II Bentivoglio a month ago, must pass a sort of exam today, the results of which will determine whether he will remain in service as a squire or not. On the day of the knightly tournament in which Signor Annibale will participate, Pietro has many important tasks to complete in order to prepare his lord well for the tournament.

### **First episode — Jouusting Armor**

The first episode of the game revolves around the artifact “Jouusting Armor” (exhibit №4 in room 18).

Pietro heads to the armory to pick out armor for his lord. In the armory, he meets an old guard who is in charge of the armor. The guard tells Pietro about the jousting armor that Signor Annibale will be wearing today. After listening to the guard's story, Pietro wants to take the armor, but it turns out that to do so, he must answer the guard's questions to test how carefully Pietro listened to the story.

A series of questions, which the player must answer by choosing one of the options provided, help to reinforce the player's knowledge of the exhibit. If the answer is incorrect, the player is given the opportunity to answer again. This continues until the player answers correctly. For each correct answer, the player receives one point, there are no penalties for incorrect answers. Thus, by the end of the experience, the player will receive the maximum number of points and be declared the “winner.”

### **Second episode — Cinquedea**

The next episode of the story revolves around the “Daga a cinquedea” artifact (exhibit №3 in room 18). After answering the guard's questions about the armor, Pietro goes with him to the weapons room, where the guard tells Pietro about the Bentivoglio family heirloom, the dagger. After the story, the guard asks questions again to test the knowledge acquired. As the episode progresses, the player learns

about a specific type of cold weapon (cinquedea) and the aesthetic canons of the Bentivoglio era.

### **Third episode — Horse head armor (Testiera)**

The third and fourth episodes of the gamified experience are played on a tablet installed in room 19. After museum visitors have moved to room 19 and listened to the guide's commentary on the exhibits on display, they continue the game they started in room 18.

The third episode of the narrative is about horse head armor (exhibit №5 in room 19). After answering the guard's questions, Pietro heads to the stables to pick out some gear for his lord's horse. At the stables, he meets a stableman who tells Pietro about the horse head armor. The stableman then asks questions. This episode of the experience gives the player an idea of how head protection for horses was designed and applied in medieval Italy.

### **Fourth episode — Parade saddle (“Sella da parata”)**

The next and final episode of the narrative tells about the parade saddle. The player learns about a specific type of saddle that was widespread in northern Italy, Germany, and France. Then the player is presented with the last set of questions, and after answering them, they proceed to the end of the game.

The story ends with Pietro, having scored the maximum number of points, being declared a full-fledged squire to Lord Annibale.

## Persona Experience

### Bruno Rossi



**Bio**  
Bruno lives with his father (real estate agent), mother (lawyer), and an 8-year-old brother. A first-year liceo student, he's quiet in class but focused, volunteering answers when topics involve technology or history. He favors IT, physics, and history, and tolerates long readings if there's a clear goal. After school he practices guitar riffs, plays computer shooting games with friends, and helps his brother with homework. His close circle is small—two classmates who game, trade PC tips, and occasionally jam together in a garage band.

*"It would be great to be a medieval knight!"*

- Age: 14
- Family: Father works as a real estate agent, mother is a practicing lawyer. Bruno also has an 8-year-old brother.
- Occupation: 1st year of High school (liceo)
- Location: Bologna
- Interests: Computer shooting games, playing guitar

**Goals:**

- To look at medieval weapons and, if possible, touch them
- Learn more about knights

**Most frequently technologies used:**

- Smartphone
- Laptop
- Smartwatch

**Frustrations:**

- Getting tired of being in others company for a long time
- Has difficulty processing large amounts of information by ear

Figure 13: Person 1 profile

Bruno is a representative of the main target audience for the “Joust Day: Bentivoglio Challenge” project. He is a middle school student living in Bologna. He likes history, and is particularly attracted to the Middle Ages because of its knightly aesthetics. He likes to imagine himself as a knight living in the Middle Ages. He enjoys listening to stories about this era and about knights, but, typical of his generation, he has a fairly narrow attention span. He finds it difficult to passively absorb information for more than ten minutes at a time. The proposed experience makes it possible to alternate between passive listening and active application of the information received. Rewards in the form of points, which the player earns by answering questions correctly, further contribute to the player's involvement in the proposed experience.

## Persona Experience 2

### Valeria Sottile



**Bio**  
Valeria balances rigorous curriculum goals with hands-on methods, such as short debates, object-based learning, and quick “exit tickets.” A graduate of UniBo (MA History + teaching qualification), she likes structured lesson plans that still leave room for discovery. Valeria manages mixed-ability classes and looks for activities where quieter students can succeed without public performance. She uses simple tech well. Outside school she volunteers at a local library and keeps a small blog about historical pedagogy and museum visits.

*“By knowing the past well, we better understand the present.”*

- Age: 35
- Family: Divorced
- Occupation: History teacher in High school (liceo)
- Location: Bologna
- Interests: Blogging, running a reading club

**Goals:**

- Spark curiosity about medieval Bologna
- Ensure every student participates
- Gather quick evidence of learning

**Most frequently technologies used:**

- Projector
- Tablet
- Laptop

**Frustrations:**

- There will be many visitors at the museum, which may interfere with the school trip
- Schoolchildren will not be interested in the museum and will go about their business

Figure 14: Person 2 profile

Valeria represents another part of this project's target audience. As a middle school history teacher, she likes to combine innovative methods and approaches in education with traditional ones. When organizing school trips to museums, Valeria often comes up with additional activities for children to make the trips more interesting for them. Coming up with these kinds of activities takes a lot of time and effort, which Valeria doesn't always have because of her heavy workload at school. In this regard, it will be especially valuable for Valeria that the Medieval Museum of Bologna offers a gamified experience that will add variety to the school trip and relieve her of the need to come up with something on her own.

## b. Conceptual map

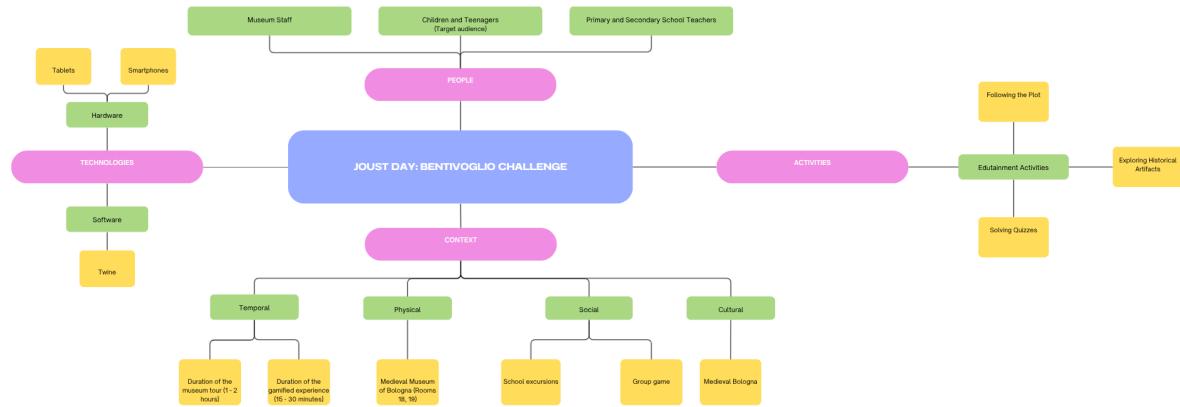


Figure 15: The Conceptual Map

## d. The story

### Introduction

Tournament morning in Bologna. Pietro, a 15-year-old squire newly entered into the service of Signor Annibale II Bentivoglio, must prove himself before his trial month ends. Guided by a teacher or tour guide, players step into Pietro's shoes: short narrated screens set the mood (bells of San Petronio, hoofbeats, murmurs in the palace corridor) and lead them toward the armoury to begin preparations.

### Episode 1 — Jousted armour (Room 18, #4)

In the armoury an elderly guard introduces tournament gear. Learners discover why a regulated *rincontro* reinforces the knight's left side, what a lance rest (*resta*) does, and how *staffoni* lock the rider's seat. A brief, low-stakes quiz checks attention before Pietro is allowed to take the artifact. Correct choices award points, wrong answers prompt a friendly retry.

### Episode 2 — Daga a cinquedea (Room 18, #3)

The guard leads Pietro to the weapons room and reveals a Bentivoglio family dagger rich with inscriptions and the motto. Players match motto, emblem, and blade

features to meanings (fury, fortune, virtue), learning how Bentivoglio-era taste “looked to antiquity.” A short quiz seals the knowledge.

### **Episode 3 — Horse head armour, *testiera* (Room 19, #5)**

Pietro leaves the armory, exits the castle, and heads to the stables to make the necessary preparations for his lord's horse.

At the stables, a broad-shouldered stableman explains the almond-profile headpiece, its spiral *tortiglione* band, and plume rosette. Players identify which parts protect eyes, ears, and cheeks.

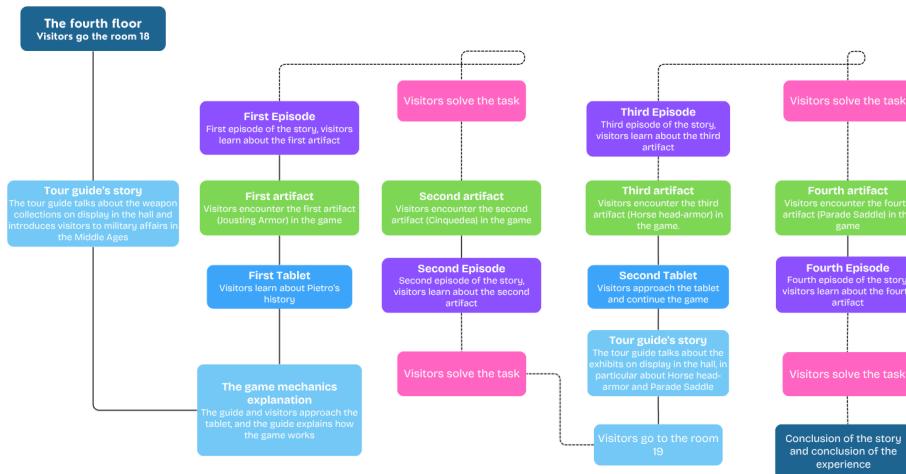
### **Episode 4 — Parade saddle, *sella da parata* (Room 19, #2)**

Then the stableman leads Pietro to the saddles and tells him about one of them, the parade “alla moscovita” saddle. Players inspect decoration and function, then complete a final micro-quiz.

### **Closure**

After answering all the questions, Pietro goes to Signor Annibale's palace, where he sees his lord already ready to leave on the steps. Pietro kneels and presents the sword, Annibale accepts his service for the tourney, Pietro will remain at the castle as a squire of Signor Annibale II.

#### f. Interaction between the application and the users



*Figure 11: The Interaction Diagram*

The proposed experience is structured in such a way that the unfolding plot and the artifacts encountered in this plot correspond to the logic of the exposition in rooms 18 and 19. Going through this experience simultaneously reinforces and deepens the knowledge gained from the guide's story.

#### g. Foreseen workflow

The “Joust Day: Bentivoglio Challenge” experience is designed to be implemented in the Medieval Museum of Bologna. The main target audience of this experience is middle school students (ages 11–14) visiting the museum as part of a school group on an excursion. At the same time, this experience may also be of interest to teenagers visiting the museum with relatives or on their own.

The experience is primarily intended to be accessed on tablets installed in the rooms. However, as an alternative, it is envisaged to wrap this experience in a mobile web application that can be accessed via a QR code by any user with a modern smartphone and a stable internet connection. It is also planned to develop this experience as a software that can be installed on a computer.

At the museum's discretion, the interactive experience may be available only through the mobile web application. This would allow the museum to avoid the costs of purchasing and maintaining tablets.

## **h. Set-up: Foreseen hardware, software and Media**

Certain hardware, software and digital media assets are required for the successful implementation of “Joust Day: Bentivoglio Challenge” experience.

The hardware primarily consists of tablets (at least two, one in each room) with displays large enough to accommodate a group of users around them. It is also proposed that the tablets be equipped with Bluetooth headphones so that users undergoing the experience do not disturb other visitors who may be in the room at the same time.

As for the software tools that were used in developing the demo-version of the experience, we should mention Twine, which was used to develop the interactive narrative, and ChatGpt used for creating images.

As for the digital media assets, they should include images and videos that visualize the developed narrative, as well as audio files that contribute to the creation of sound images of the narrative, making the experience more immersive.

## **i. Further development and maintenance issues**

To keep the experience relevant and accessible to visitors, it is necessary to follow measures such as hardware maintenance and monitoring the logical connection between the experience and the exhibition, which may change over time.

As for the further development of the project, several things are necessary. First of all, this includes periodically updating the front-end and back-end of the experience in accordance with modern gaming industry standards. Secondly, feedback should be collected to understand how the experience can be improved and supplemented. Short surveys can be used as a form of feedback collection: participants should be asked to complete them at the end of the experience on the same tablets.

## 6. Disruption

### Relevance of experience

**Risk.** Narrative/tasks become stale or misaligned with the display over time.

**Mitigation.** Keep text/media in a simple JSON bundle so curators can update labels or swap an object without rebuilding the game. Schedule a light refresh of questions each semester.

### Funding

**Risk.** Not enough budget to keep tablets/headphones in Rooms 18–19 or to add spares.

**Mitigation.** Take care of creating a fallback mobile-web version accessible via QR codes, so the experience still runs even if there are problems with tablets.

### Compatibility

**Risk.** The same Twine build needs to run on different screens (tablets vs. phones).

**Mitigation.** Build responsive passages (large tap targets, minimal typing), test at 1024×768 and common phone widths, keep audio optional and short to avoid stuttering, pre-load only the next episode's assets.

### Crowding and distraction

**Risk.** Peak times create noise and queueing around the devices.

**Mitigation.** Install additional tablets in each room to allow more people to participate in the experience at the same time. To eliminate any potential noise issues, provide participants with headphones (or allow them to connect their own headphones to the device).

### Romanticizing violence

**Risk.** Romanticizing combat/violence.

**Mitigation.** Ensure that the tasks in the proposed experiment (which is updated periodically) are related to physical training, **heraldry, preparation** (not hitting targets).

### Insanitary conditions

**Risk.** Shared tablets/headphones accumulate dirt, touchscreens degrade.

**Mitigation.** Daily wipe protocol, weekly screen-protector swap, foam ear-pad spares.

## 7. Team roles and work

Sergei Slinkin — Workflow design, Bibliographical research, Twine narrative development, Image acquisition, Persona profiles creation, Website creation, Documentation

## 8. UX Scenario (Twine)

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