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PLAYABLE HERITAGE: LUDIC REPRESENTATIONS IN TURIN MUSEUMS

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The paper examines gaming practices adopted by museums in Turin, moving beyond the interpretation of play as a mere tool for engagement or education. It investigates how making heritage "playable" reshapes access to knowledge by organising experience through rules, goals, interactions, and pathways. A qualitative comparison of five institutions—Museo Egizio (ME), Musei Reali (MRT), Museo d'Arte Orientale (MAO), Museo Nazionale dell'Automobile (MAUTO), and Museo Nazionale del Cinema (MNC)—uses an analytical matrix based on purpose, target audience, dominant interaction, and digital spatiality. The cases reveal a range of representational regimes, from micro-games and guided 2D tours to augmented-reality missions, 3D treasure hunts, simulations, and avatar-based virtual environments. Their value depends on coherence between ludic and museographic logics, interface legibility, meaningful choice, and a recognisable distinction between museum information and ludic-narrative construction. Two critical issues emerge: cognitive load reduction, in which interpretive effort is reduced to facilitate task completion, and epistemic opacity, in which data and storytelling merge without clear cues. The paper proposes criteria for analysing how ludic practices produce different regimes of heritage representation.

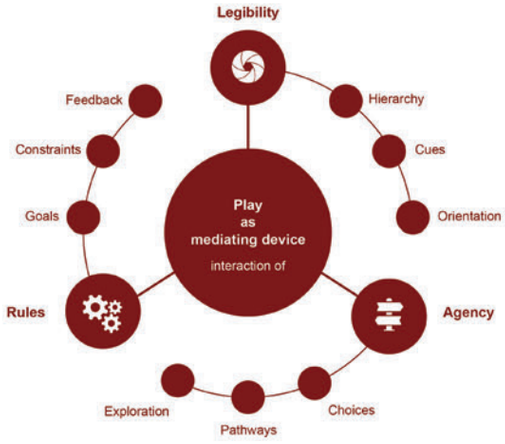
Keywords: Museum gamification, Heritage representation, Mediation device, Digital spatiality, Agency.

From play as engagement to play as representation

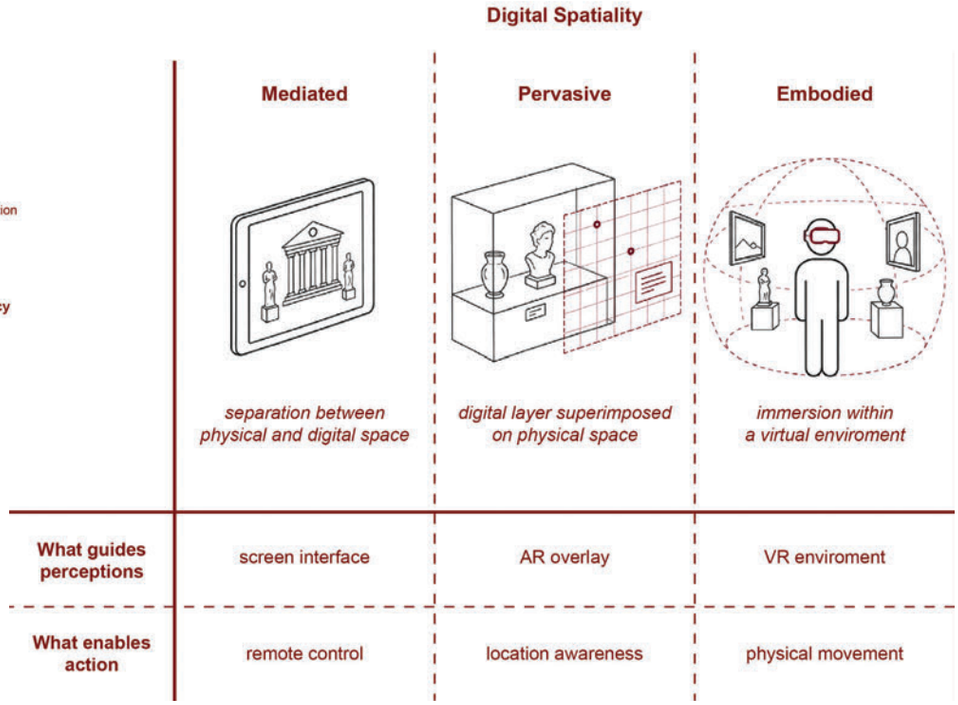
In debates on digital practices in museums, play is often framed as a solution to increase engagement or as an educational aid, that is, an additional layer applied to already defined contents[1]. This perspective is helpful to describe communication and learning goals, but it can weaken the scientific problem that gaming introduces into systems of heritage representation. When museum content becomes playable, the change extends beyond the experience's tone. The conditions of access to knowledge also shift, because the visit is organised through rules, objectives, and actions that determine what visitors can do, see, and understand[2]. In this sense, play does not simply motivate visitors. It acts as a device that shapes what becomes visible and defines how the public produces the experience.

Recent studies document the growth and diversification of game-based approaches to cultural heritage. A 2026 narrative review identifies an interdisciplinary field in which games function not only as tools for engagement and education but also as media for organising heritage content and supporting interpretation and dissemination[3]. Recent museum research has also begun to shift attention from isolated game elements to the affordances through which digital devices enable particular actions and interactions and shape experiential outcomes[4]. A comparative study of gamified virtual-reality museum environments shows how mechanics, guidance, and interface design structure navigation, participation, and learning[5]. Recent typological work likewise classifies mu-

1 Tallon, Walker (eds.), *Digital Technologies and the Museum Experience;* Kidd, *Museums in the New Mediascape;* Simon, *The Participatory Museum.*
2 Salen, Zimmerman, *Rules of Play;* Juul, *Half-Real.*
3 Chunlan, Tengku Wook, Rosdi, *Game-enhanced cultural heritage.*
4 García-Milon, Tom Dieck, Jung, *Gamification in digital museum experiences.*
5 Alatrash, Arnab, Antlej, *Gamifying Museum Exploration.*



1 | *Play as a mediating device: rules, legibility, and agency, and the elements through which they structure interaction.*



2 | *Three configurations of digital spatiality – mediated, pervasive, and embodied – and the interfaces, perceptual cues, and forms of action associated with each.*

> *When play enters the museum, two spaces must be designed and kept in balance.*

seum games according to their design intentions and modes of implementation[6]. Taken together, these approaches indicate a growing concern with the relationships among rules, interfaces, space, and visitor action. Nevertheless, evaluation remains largely centred on engagement, usability, immersion, and learning outcomes, suggesting that the representational regimes through which museums select, organise, and qualify heritage as playable content remain less explicitly examined.

Against this background, this paper argues that, in the Turin practices considered, there is a shift from play understood mainly as engagement to play understood as representation[7]. Play is treated here as a spatial and performative medium, able to construct simulated and navigable digital spaces in which narrative emerges from action rather than from the presentation of content. This approach acknowledges that the form of the experience depends on how space is made visible and navigable, because the interface directs attention, organises space, and makes the rules legible[8].

Building on this premise, the paper examines a heterogeneous set of museum experiences developed in Turin. The aim is not to assess whether these solutions are effective in terms of satisfaction or learning outcomes, but to understand which regime of heritage representation they construct. To make the analysis comparable, the article adopts two analytical criteria, one related to the nature of digital space and the other to the ways play is used in museums. Both criteria are defined in the theoretical framework. The research question guiding the study is: How do game mechanics reshape the relationships among content, space, and audiences in Turin museums?

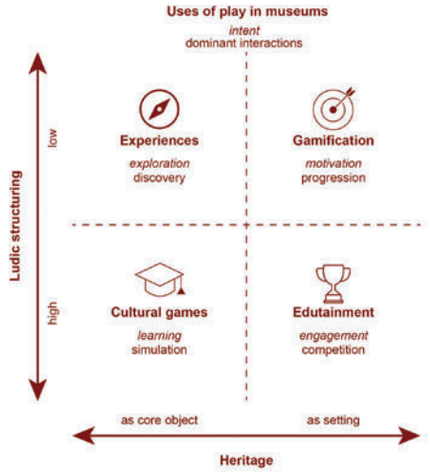
While play can make cultural relationships and historical processes more intelligible, it can also introduce simplifications, access hierarchies, and interpretive ambiguities, especially when the boundary between museum data and narrative construction is unclear. The epistemological value of play is therefore not automatic. It depends on how the device structures rules, visualisation, and possibilities for action.

For this reason, the paper first clarifies which components of the ludic device affect the legibility of heritage and the quality of the experience.

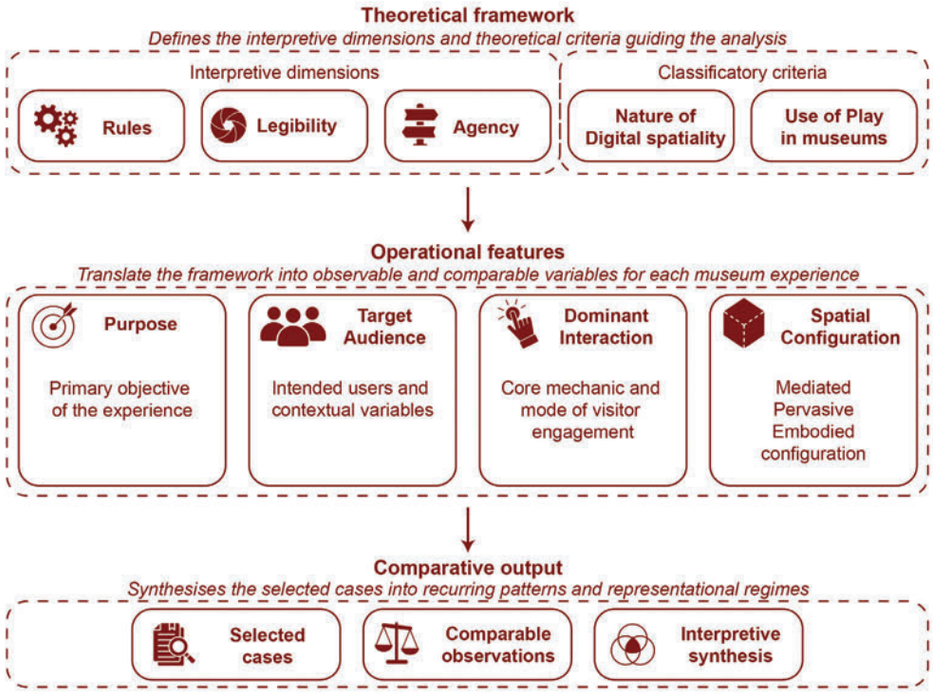
Ludic space as a device: rules, legibility, and agency

To treat play as representation means to regard it as a mediation device that constructs experience, rather than as a

[6] Seale, Smith, Rogerson, *A Typology of Museum Games*.
[7] Bogost, *Persuasive Games;* Murray, *Hamlet on the Holodeck;* Champion, *Critical Gaming.*
[8] Attademo, *Lo spazio narrativo nei videogiochi.*
[9] Salen, Zimmerman, *Rules of Play;* Juul, *Half-Real.*



3 | *Heuristic taxonomy of museum uses of play according to the degree of ludic structuring and the role assigned to heritage, distinguishing experiences, gamification, cultural games, and edutainment.*



4 | *From theoretical framework to analytical grid: interpretive dimensions and classification criteria are operationalised as four features – purpose, target audience, dominant interaction, and spatial configuration – to support comparison and interpretive synthesis of the selected cases.*

simple container for museum content. From this perspective, a ludic experience emerges from the interplay of a core concept, a technological infrastructure that enables it, and a visual form that guides its use. Narrative is therefore not only told. It develops through what the user does, because action takes place within a system of rules (that define how the experience works), objectives (that indicate what the user is expected to achieve), and constraints (that set the spatial, temporal, or informational limits within which action is possible)[9].

As a result, the representational value of play does not coincide with the visual rendering of heritage alone[10]. It depends on how play, as a mediation device, organises the conditions of experience by establishing which actions are possible and which trajectories become practicable, or are excluded. In other words, play also represents because it directs attention and understanding through what it allows users to do within the space it constructs.

To make this reconfiguration analytically tractable in the museum domain, ludic space is understood here as a device articulated into three components: rules, legibility, and agency[11] (fig. 1).

1. The rules dimension concerns the structure of the experience. Rules, objectives, and constraints define what visitors can do and what the system recognises as a relevant action. When heritage is made playable, knowledge is produced not only through the presentation of information, but also through the completion of tasks and the achievement of thresholds that orient attention and shape understanding.

2. The legibility dimension concerns the system of cues and hierarchies through which the experience communicates what matters. Design and interface are not secondary, because they direct attention, organise space, and make the rules perceptible. Representation therefore depends on how digital space is articulated and on how relevant elements are made distinguishable and interpretable.

3. The agency dimension concerns the quality of visitor participation. Agency makes it possible to distinguish between experiences that offer meaningful choices and those that simulate freedom within strongly prescribed paths. This distinction is central to the epistemic value of play in museums, because it affects the balance between exploration and guidance and, therefore, the kind of

[10] Bogost, *Persuasive Games;* Champion, *Critical Gaming.*

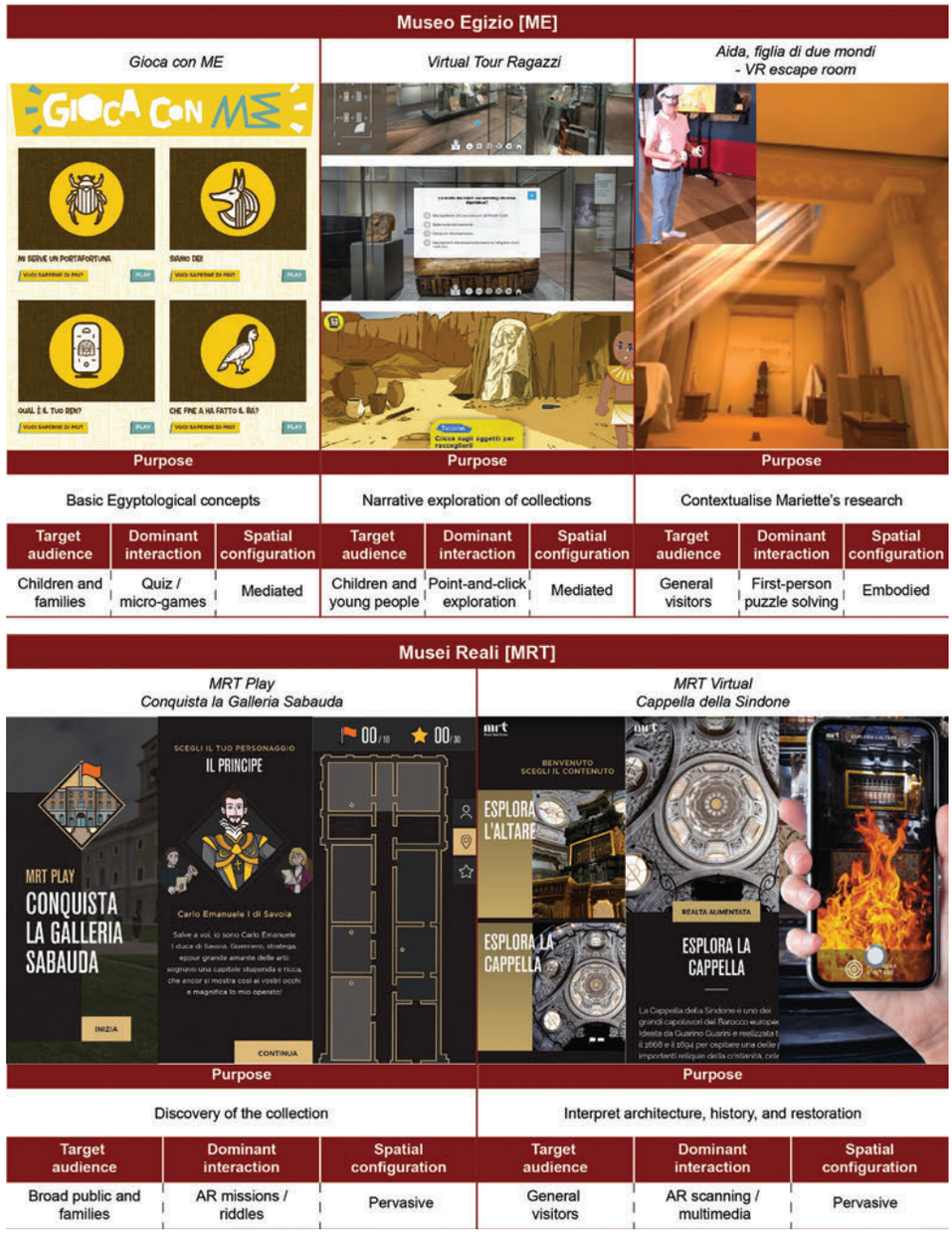
[11] Hooper-Greenhill, *Museums and the Interpretation of Visual Culture;* Parry, *Recoding the Museum.*

[12] McGregor, *Situations of Play: Patterns of Spatial Use in Videogames;* Montola, Stenros, Waern, *Pervasive Games.*

[13] Barandoni, *Games in Museums. A Necessary Evil?*

[14] Yin, *Case Study Research: Design and Methods;* Miles, Huberman, Saldaña, *Qualitative Data Analysis.*

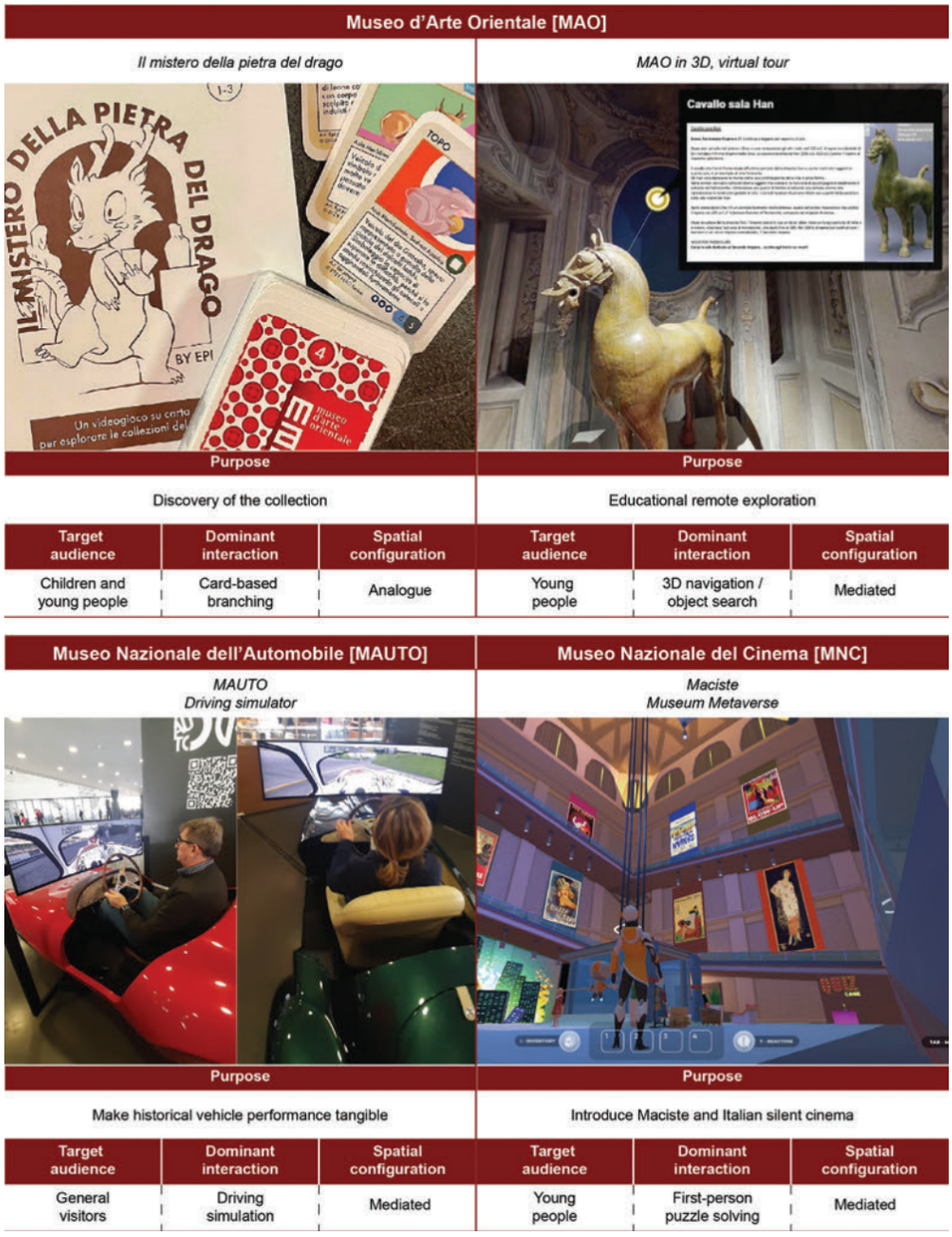
interpretation the experience enables.
The comparison between ludic and museum spaces shows that rules, legibility, and agency are not abstract concepts but outcomes of concrete design choices. Game space is designed to activate actions and is defined through interaction, whereas architectural space maintains its function and legibility even in the absence of participation. For this reason, the analysis must examine how ludic experiences are embedded within the museum setting and how they reorganise routes, hierarchies of attention, and interpretive priorities.
To avoid making cases that are very different incomparable, the theoretical framework adopts two criteria.
- The first concerns the nature of digital spatiality, articulated into mediated, pervasive, and embodied spaces[12] (fig. 2). This distinction matters because it changes the relationship between the digital experience and the museum context and, as a result, it affects how rules, legibility, and agency are designed.
- The second criterion concerns the ways play is employed in museums, articulated into experiences, gamification, edutainment, and cultural games[13]. Here, these categories are used as descriptive tools to distinguish purposes, forms of interaction, and the role assigned to heritage, which may become the central object, a narrative pretext, or a simple setting (fig. 3).
On this basis, the following section applies these dimensions through a comparative grid to analyse the Turin cases.



5 | *Selected experiences from Museo Egizio (top, from left to right): Gioca con ME (a), Virtual Tour Ragazzi (b), and Aida, figlia di due mondi, a VR escape room (c); and from Musei Reali (bottom, from left to right): MRT Play – Conquista la Galleria Sabauda (d) and MRT Virtual – Cappella della Sindone (e). Each panel summarises purpose, target audience, dominant interaction, and spatial configuration.*

Comparative method: the Turin cases and the analytical grid

The paper adopts a qualitative comparative analysis of a corpus of museum experiences developed in the Turin context, selected to ensure heterogeneity across technologies, interaction forms, and intended audiences[14]. The corpus includes five institutions: Museo Egizio (ME), Musei Reali (MRT), Museo d'Arte Orientale (MAO), Museo Nazionale dell'Automobile (MAUTO), and Museo Nazionale del Cinema (MNC). These institutions were chosen because, within the same territorial context, they present different profiles and collections, enabling a comparison across diverse ludic devices. The initiatives considered range from micro-games and quiz-based trails to 3D tours, augmented reality (AR) applications, virtual reality (VR), and extended reality (XR) experiences. The goal is not to measure effectiveness in terms of learning or satisfaction, but to describe and compare the representational regimes that emerge when heritage is made playable.
The primary unit of analysis is the individual ludic-museum experience, while each institution constitutes a comparative case within which one or more experiences are examined. Each experience is treated as a complete and recognisable mediation device.



6 | *Selected experiences from Museo d'Arte Orientale (top, from left to right): Il mistero della pietra del drago (a) and the MAO in 3D, virtual tour (b); from Museo Nazionale dell'Automobile (bottom left): the MAUTO driving simulator (c); and from Museo Nazionale del Cinema (bottom right): the Maciste Museum Metaverse (d). Each panel summarises purpose, target audience, dominant interaction, and spatial configuration.*

For each case, the study considers together the digital space constructed by the experience, the mechanics regulating interaction, and the mediation choices through which heritage is selected, organised, and made intelligible.

The analytical grid translates the theoretical framework into a set of comparable observations without establishing a one-to-one correspondence between each concept and a single feature. Rules, legibility, and agency operate as transversal interpretive dimensions: rules are traced through the objectives, constraints, and mechanics that structure each experience; legibility through the visual, spatial, and informational cues that make content, pathways, and rules understandable; and agency through the actions, choices, and degrees of autonomy available to visitors.

The two theoretical criteria provide the main classificatory axes. Digital spatiality is defined by the distinction between mediated, pervasive, and embodied spaces. The ways play is employed in museums are analysed by examining the relationship between the experience's intended purpose and its dominant interaction, and are further qualified by the role assigned to heritage. The target audience acts as a contextual variable, since it affects language, complexity, guidance, and the range of choices offered.

Together, these dimensions and criteria are operationalised through four features that make the selected cases observable and comparable (fig. 4):

- The first feature concerns the experience's stated purpose and allows for distinguishing primarily narrative, educational, exploratory, or engagement-oriented approaches.
- The second concerns the target audience, since design changes significantly when an experience is addressed to school groups, general visitors, or more specialised publics. This choice affects language, complexity, and the degree of guidance;
- The third feature concerns the form of interaction, that is, the dominant mechanic through which visitors act, such as quizzes, missions, treasure hunts, simulations, 3D tours, or AR and VR interactions.
- The fourth feature concerns the nature of the digital space constructed by the experience, distinguishing between mediated, pervasive, and embodied spatialities. This makes explicit how the relationship between the digital environment and the museum context evolves and, consequently, how access and understanding conditions are reconfigured.

Operationally, each case is described through a case sheet compiled using the grid, which is then included in a comparative reading that highlights convergences and differences across the analysed experiences. The resulting synthesis is an interpretive synthesis of recurring patterns and design tensions across the cases, which will help discuss

7 | *Comparative synthesis of the nine selected experiences across five Turin museums, classified by purpose, target audience, dominant interaction, and spatial configuration.*

Museum	Experience	Purpose	Target audience	Dominant interaction	Spatial configuration
Museo Egizio [ME]	*Gioca con ME*	Basic Egyptological concepts	Children and families	Quiz / micro-games	Mediated
	Virtual Tour Ragazzi	Narrative exploration of collections	Children and young people	Point-and-click exploration	
	Aida, figlia di due mondi - VR escape room	Contextualise Mariette's research	General visitors	First-person puzzle solving	Embodied
Musei Reali [MRT]	*MRT Play Conquista la Galleria Sabauda*	Discovery of the collection	Broad public and families	AR missions / riddles	Pervasive
	MRT Virtual Cappella della Sindone	Interpret architecture, history, and restoration	General visitors	AR scanning / multimedia	
Museo d'Arte Orientale [MAO]	*Il mistero della pietra del drago*	Discovery of the collection	Children and young people	Card-based branching	Analogue
	MAO in 3D, virtual tour	Educational remote exploration	Young people	3D navigation / object search	Mediated
Museo Nazionale dell'Automobile [MAUTO]	*MAUTO Driving simulator*	Make historical vehicle performance tangible	General visitors	Driving simulation	Mediated
Museo Nazionale del Cinema [MNC]	*Maciste Museum Metaverse*	Introduce Maciste and Italian silent cinema	Young people	First-person puzzle solving	Mediated

how play, as a device, redefines the representation of heritage.

The Turin cases and their representational regimes

At this point, attention shifts to the five cases in the corpus.

Museo Egizio (ME)

Within the selected corpus, Museo Egizio provides three particularly indicative experiences because, within the same institution, they show different ways of using play and different levels of narrative depth.

A first example is *Gioca con ME*, a set of online games aimed mainly at younger audiences. Here, digital space remains mediated by the screen, and interaction is based on quizzes and micro-tasks. The museum's purpose is to introduce basic Egyptological concepts in a light, edutainment-style way, with simplification as part of the access strategy that supports a fast-paced experience[15] (fig. 5a).

A second example is the *Virtual Tour Ragazzi*, which shifts the focus from the single question or challenge to the visit as a structured pathway. The tour guides users through the exploration of two museum rooms, the village of Deir el-Medina, and the funerary assemblage of Kha and Merit. It remains a mediated experience, but it introduces a more narrative and decision-oriented structure. Through point-and-click interactions, short moments of choice, and a narrative component, the visit takes the form of a "light" cultural game. In this case, the experience does not merely transmit information; it constructs an image of heritage by connecting the exhibition setting with an interpretive reworking of Egyptian imaginaries[16] (fig. 5b).

The third example, the VR escape room dedicated to Mariette, introduces embodied spatiality and first-person interaction, radically altering the relationship among content, space, and agency. The escape room logic organises the experience through puzzles and tasks, aiming to narrate Egyptological research and the context that links the figure of the archaeologist to the origins of Verdi's Aida. Here, the credibility of the environment and the quality of the reconstruction become decisive conditions, because the value of mediation depends on coherence between the constructed space, the rules of the experience, and the plausibility of the narrative[17] (fig. 5c).

Taken together, these three examples show how the same museum uses play for different purposes and with varying narrative depth, moving from a simplified, rapid transmission of content to more immersive devices that invest in

15 Museo Egizio, *Gioca con ME* (Kids&Family), https://kidsandfamily.museoegizio.it/gioca-con-me/

16 Museo Egizio, *Virtual Tour Ragazzi*, https://www.museoegizio.it/esplora/notizie/online-il-nuovo-virtual-tour-ragazzi/

17 Museo Egizio, *L'escape room virtuale – Aida, figlia di due mondi*, https://museoegizio.it/esplora/appuntamenti/lescape-room-virtuale-aida-figlia-di-due-mondi/; Mastino, *AIDA VR*, https://www.chiaramastino.com/portfolio-item/aida-vr-museo-egizio/

the construction of an interpretive experience. This suggests that representational value does not derive from adopting play as such, but from the coherence between museum objectives, the dominant mechanic, and the form of digital space, as well as from the ability to keep the boundary between museum data and narrative construction recognisable.

Musei Reali (MRT)

In the case of the Musei Reali, the selected practices clearly show an investment in a pervasive dimension of play, understood as a hybridisation between the physical setting and digital layers that intervene in the visit without replacing it. The first example, MRT Play – *Conquista la Galleria Sabauda*, constructs a device in which the museum remains the core of the experience. Still, the visit is rewritten as a sequence of missions, challenges, and objectives. Interaction is guided by game-design mechanics that invite visitors, often younger or less familiar with museum-going, to explore the gallery through a structured progression. In this configuration, gamification functions as a system of orientation and activation. It does not merely add content, but also organises the timing, stages, and priorities of the visit, turning movement through space into an articulated task[18] (fig. 5d).

The second example, MRT Virtual – *La Cappella della Sindone*, maintains a pervasive logic but shifts the centre of gravity from ludic objectives to narrative construction. The experience approaches an augmented-reality mode, with the visit accompanied by a spatial narrative focused on the Chapel's history, transformations, and restoration. Here, the digital layer does not primarily impose a sequence of challenges. Instead, it builds an interpretive overlay that guides attention and supports understanding of the place, aligning more closely with the category of experiences and featuring a strong storytelling component anchored to space[19] (fig. 5e).

Taken together, the two cases show both continuity and difference. In both, the physical environment remains central and is "enhanced" by digital layers that orient attention and structure the route. The difference lies in how this structuring operates: in the first case, the logic of missions and completion prevails; in the second, the logic of narrative and interpretive visualisation is dominant. This suggests that pervasive digital spatiality produces representational value when the digital layer does more than guide movement. It should support a coherent reading of heritage and its context, avoiding a situation in which progression and challenge become the sole organising principle of the experience.

Museo d'Arte Orientale (MAO)

In the case of MAO, the selected experiences show a hybrid articulation of the relationship between play and the museum visit, because heritage is translated into tasks, puzzles, and choices rather than remaining at the level of description alone.

A first example is *Il mistero della pietra del drago*, a card-based gamebook set in the museum's physical space. Here, the exhibition setting becomes a playable field, and interaction is organised through a progression logic, with challenges and decisions guiding children and families in autonomous exploration of the collection. The approach is clearly oriented toward edutainment, yet the relevant point is that mediation does not occur only through explanations. It is produced through a device that distributes attention and understanding across a sequence of actions[20] (fig. 6a).

The second example is a 3D virtual tour structured as a treasure hunt, designed especially for schools and accessible remotely. In this case, space remains primarily mediated, but it plays a more decisive role than in simple consultation tools, because navigating the 3D environment becomes the condition of the experience itself. The visit is reconstructed as a gamespace that reproduces the museum rooms, and interaction combines exploration with the search for key objects, turning attention into a task-oriented approach toward recognition and rapid linking. In this configuration, the experience sits between edutainment and a more structured form of knowledge acquisition, extending the visit. It retains an educational goal, but achieves it through a mechanism that selects and hierarchises content based on what is "findable."

As a result, the objective system modu-

[18] VisiVaLab, *MRT Play – Conquista la Galleria Sabauda*, https://visivalab.com/it/portfolio-item/mrt-play-conquista-la-galleria-sabauda/ .

[19] VisiVaLab, *MRT Virtual*, https://visivalab.com/it/portfolio-item/mrt-virtual-app-di-guida-con-realta-aumentata/.

[20] MAO Torino, *Il mistero della pietra del drago*, https://www.maotorino.it/it/evento/presentazione-del-nuovo-librogioco-del-mao/ .

[21] Comune di Torino, *Tour virtuale 3D con caccia al tesoro, https://comunicatistampa.comune.torino.it/archivio/2020/article_283.shtml* .

[22] VoltoWeb, *Museo dell'Automobile: simulatori di guida dal 25 marzo 2024, https://www.voltoweb.it/si2010/museo-dellautomobile_simulatori-di-guidadal-25-marzo-2024/* .

[23] Museo Nazionale del Cinema, *Metaverso MNC, https://www.museocinema.it/it/news/9508.*

[24] Nicholson, *A RECIPE for Meaningful Gamification;* Hanus, Fox, *Assessing the Effects of Gamification in the Classroom.*

lates visitors' autonomy and the pace of progression, thereby steering exploration toward predefined targets[21] (fig. 6b). Taken together, the two examples show how MAO uses play to make the discovery of the collection practicable through different forms, one analogue and situated in physical space, the other digital and mediated through a 3D environment. This implies that translating heritage into tasks and challenges can support orientation and attention. Still, it also requires careful work to make explicit the criteria by which objects are selected and ordered. Otherwise, searching and completing tasks may replace interpretation.

Museo dell'Automobile (MAUTO)

In the case of MAUTO, the analysed experience differs from the other examples because play mainly takes the form of simulation. The experience unfolds in a mediated space, with interaction centred on a driving simulator. For this reason, rather than a video game in a strict sense, it can be described as an experience with edutainment elements, since it lacks an explicit game structure based on levels, scoring, or an articulated narrative. The device primarily works on the performative and bodily dimensions of action, allowing visitors to experience the use of a historical vehicle and to grasp, through embodied interaction, performances and behaviours that the exhibited object alone can hardly convey[22] (fig. 6c).

In this configuration, automotive heritage is not primarily explained, but made practicable as an experience. Simulation produces an immediate gain in plausibility and involvement by shifting attention from description to trial, turning the vehicle into an opportunity for situated learning. At the same time, precisely because the game structure is weak or absent, interpretive value depends on the extent to which the experience connects action to the museum context. It must clarify what the simulation is meant to make intelligible and how it relates to the collection's themes. This implies that simulation, while effective in making heritage tangible through performance, risks remaining an autonomous attractive activity unless it is supported by a mediation framework capable of making the cultural meaning of what visitors are experiencing legible.

Museo Nazionale del Cinema (MNC)

In the case of the Museo Nazionale del Cinema, the experience dedicated to Maciste presents an explicitly videogame-based setup that differs from the other examples because it constructs a digital environment conceived as a space for exploration and interaction. The spatiality is mediated, yet it is modelled on the *Aula del Tempio*, so that the virtual setting retains a recognisable reference to the museum space while acquiring a relative autonomy as a practicable "world." Interaction is structured through a combination of quizzes, missions, and obstacles, and it also includes an avatar. This reinforces a progression in which visitors do not simply consult content, but traverse it through a sequence of actions (fig. 6d).

The stated aim is to introduce the figure of Maciste and the context of silent cinema through a videogame language that translates heritage into characters, scenes, and tasks. In this configuration, cinematic heritage can remain central when ludic progression clearly refers to materials, contexts, and cultural references. It can instead shift toward a mere setting when the experience's form absorbs the identity of the contents, that is, when mission logic becomes the primary organisational principle of the visit. Visitor participation is also strongly shaped by the device, since the task sequence structures timing and priorities. At the same time, the avatar tends to reinforce a perception of agency that, in practice, depends on the range of choices actually available[23].

In this case, the most delicate variable concerns the clarity of the boundary between museum information and narrative construction. When storytelling and data are integrated without recognisable cues, it becomes difficult to understand what belongs to sources and contexts and what is instead a reconstruction functional to game progression. This implies that virtual environments can expand the possibilities for mediation. Still, they require explicit control over coherence between rules, narrative, and the epistemic status of contents, so that fiction supports the understanding of heritage rather than replacing it.

Overall, the analysis shows that the Turin cases activate different representational regimes, determined by how spatiality, mechanics, and forms of participation are designed (fig. 7).

The following section recomposes these results critically by discussing cross-cutting gains and losses and by clarifying how play, as a mediation device, can expand interpretive possibilities and, conversely, when it tends to simplify them or render them opaque in the relationship between heritage and the institution.

Discussion

Across the analysed cases, play emerges as a mediation device that reorganises the museum experience and produces distinct representational regimes, beyond a simple logic of engagement. From this perspective, 'gains' and 'losses' do not depend on the degree of digitalisation, but on how rules, legibility, and agency are translated into concrete design choices and integrated into the institution's logics and spaces. Play can broaden the understanding of heritage when it enables visitors to build relationships and interpretive connections through action. It can, however, weaken mediation when the experience is reduced to "completing activities," and it becomes unclear what counts as museum information and what instead belongs to fiction or to ludic simplification. The comparison highlights three recurring features:

Narrative anchoring to heritage

The most robust experiences are those in which heritage does not function merely as a theme or as scenery, but as a generative element that shapes choices, challenges, and visitor trajectories. In these cases, the ludic form becomes a mode of reading, because user action brings to the surface relationships among objects, spaces, and contexts and makes interpretive connections practicable. By contrast, when the narrative is mainly decorative, game mechanics become the fundamental organising principle of the experience. Museum content is reduced to a pretext for progression, and rep-

resentation loses density because only what is needed to complete the task matters.

Coherence between ludic and museum spaces is described in terms of spatial credibility and plausibility

Credibility does not coincide with realism, but with consistency between the rules of the experience and the museographic logics that structure the exhibition. In pervasive or embodied devices, missions and objectives introduce an implicit hierarchy of stages and priorities that can strengthen orientation but may also conflict with the museum's interpretive hierarchy. If challenge logic dominates, physical space risks becoming an indifferent support, a backdrop for "scoring points," and the visit loses its interpretive status. From this perspective, the distinction between mediated, pervasive, and embodied spatiality helps clarify that, as anchoring to context increases, design responsibility also increases in keeping museum and ludic legibility aligned.

Interpretive governance, that is, how play and the institution negotiate authority and control over cultural discourse

Rules are never neutral, because they embed choices about content, access thresholds, language, and levels of complexity, and they also determine how visible the museum's role as mediator remains. This dimension is especially sensitive in experiences closer to gamification and edutainment, where objectives and rewards can rigidify use and turn participation into compliance. The distinction among experiences, gamification, edutainment, and cultural games is helpful because it enables analysis of how each format redistributes agency and interpretive authority, and which representational costs or benefits it entails.

From these three issues, a transversal thesis emerges. When play enters the museum, two spaces must be designed and kept in balance. On one side, there is the physical museum space, with its exhibition logics, orientation systems, and interpretive frameworks. On the other side, there is ludic space, constructed through rules and interfaces that make action possible and meaningful.

Design weakens when one of the two is treated as a mere container for the other. If physical space is reduced to scenery, museum mediation loses depth. If ludic space is reduced to a marginal add-on, the experience becomes incoherent and participation remains only nominal.

Within this framework, two cross-cutting critical issues can be identified as design problems:

- The first is the risk of excessive cognitive load reduction, which occurs when objectives and rewards simplify interpretive effort in order to facilitate progression, potentially compressing the complexity of heritage into micro-tasks[24].
- The second is the risk of epistemic opacity, when storytelling and museum data merge without cues, making it difficult to distinguish between information, interpretation, and simplification. Analytically, these issues concern agency and legibility, particularly the legibility of the epistemic status of content. It follows that the value of play, as representation, depends on the ability to make the experience practicable without making its premises invisible[25].

Conclusions

The analysis of the Turin cases shows that, in museums, ludic practices differ less by the technologies adopted and more by the design of the experience. What changes are the organisation of the route, the rhythm of interaction, the degree of choice offered to visitors, and the clarity with which the experience distinguishes between museum information and ludic-narrative construction. As a result, even within the same institution, play can operate at different depths, ranging from simplified solutions intended to facilitate access to more immersive experiences in virtual environments to more complex formats that require greater commitment. Across this spectrum, heritage may remain at the centre of the experience, or it may become a narrative support or a simple frame.

The article's contribution lies in proposing a reading that treats these initiatives as representational devices rather than as projects to be assessed primarily by their communicative effectiveness. The comparative approach enables controlled description of what happens when a collection or museum context is translated into tasks, missions, simulations, and explorable environments. A cross-cutting critical point emerges: representation becomes more robust when the experience maintains coherence between ludic and museographic logics and keeps the epistemic status of content recognisable, preventing progression and reward from becoming the sole organising principle of the visit. In this respect, the distinctions between mediated, pervasive, and embodied spatiality and between types of museum uses of play are useful as descriptive tools to capture differences in approach without reducing cases to generic labels.

The limitations of this work should be noted. First, the comparison is qualitative and focuses on what the devices make observable as designed experience, without including direct measures of learning, satisfaction, or in situ behaviour. Second, the corpus is purposive and restricted to the Turin context and therefore does not aim to generalise findings to the broader museum landscape. On this basis, future research primarily follows two directions. The first is to complement the comparative analysis with field observations to examine how different publics interpret rules and interfaces and, during the visit, distinguish between museum information and ludic components, including mechanics and narrative frames. The second is to extend the comparison beyond Turin to distinguish local tendencies from more general patterns and to consolidate the adopted categories as transferable analytical tools.

[25] The London Charter for the Computer-based Visualisation of Cultural Heritage, Version 2.1.; Bentkowska-Kafel, Denard, Baker (eds.), *Paradata and Transparency in Virtual Heritage.*

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