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Article

Experiencing Authenticity of the House Museums in Hybrid Environments

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Abstract: The paper presents an existing scenario related to the advanced integration of digital technologies in the field of house museums, based on the critical literature and applied experimentation. House museums are a particular type of heritage site, in which is highlighted the tension between the evocative capacity of the spaces and the requirements for preservation. In this dimension, the use of a seamless approach amplifies the atmospheric component of the space, superimposing, through hybrid digital technologies, an interactive, context-driven layer in an open dialogue between digital and physical. The methodology moves on the one hand from the literature review, framing the macro themes of research, and on the other from the overview of case studies, selected on the basis of the experiential value of the space. The analysis of the selected cases followed as criteria: the formal dimension of the technology; the narrative plot, as storytelling of socio-cultural atmosphere or identification within the intimate story; and the involvement of visitors as individual immersion or collective rituality. The paper aimed at outlining a developmental panorama in which the integration of hybrid technologies points to a new seamless awareness within application scenarios as continuous and work-in-progress challenges.

Keywords: seamless design; digital storytelling; hybrid environments



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1. Introduction

In recent years, the systematic use of digital technologies, in physical cultural spaces, follows a more general trend of awareness of the importance of the communication and fruition of cultural heritage beyond conservation [1]. Following this perspective, to approach cultural heritage means emphasising the importance of making the intangible component explicit as a display of stories, gestures, and behind-the-scenes of the artworks on display within cultural spaces that act as laboratories, open to a narrative from different points of view. Thus, fruition is experienced in a dimension of *sensory turn* [2], shifting the focus from the informative to the emotional dimension [3].

Furthermore, the advanced integration of digital technologies within cultural spaces allows reflection on potential of amplifying the material dimension of space and the hybrid [4–6], blended [7], and *phygital* [8–11] as an open dialectic between digital and real space and simultaneous overlapping of analog and physical tools and digital devices in ICT such that “the intersection of these new paradigms fosters story-driven experiential interaction and the humanization of technology as a mediation of the experience with physical, cognitive, or virtual space” [8] (p. 451).

The superimposition of a digital layer, therefore, follows a dual perspective: the alignment between digital and real space such that the virtual layer acts as a coherent continuation of the space itself, starting from the context and then expressing in the narration of the stories linked to the reference space; the stimulation of involvement of the visitor according to a change of the space–time coordinates of traditional fruition,

moving from a sequential and continuous towards a fragmented and hypertextual path, linked by the logic of association and mediated by the visitor, in a dimension of *aesthetics of relations* [5]. The interconnected dimension of the involvement of the visitor is translated into a bodily stimulation, which attributes centrality to gesture and bodily movement as the main form of understanding the world [12,13], pushing the exhibition into a performative space as an overwriting of an experiential time-space [14].

In this context, the case of house museums, as a field of experimentation of the use of digital technologies, starts from the consideration of the narrative potential, linked to the immaterial value of the space and the artworks on display. The house museum stands as an expression of a glimpse of a past heritage and as an entrance into the spirit of the house, an intimate and domestic dimension of the people who lived there, reactivated in a cultural circuit [15]. This condition represents a privileged field of investigation to analyse a seamless approach [16,17] in the use of digital technology, which allows being adapted to the requirements of immobility and preservation of the interior configuration but also to push towards an experiential relationship with space, amplified by technologies. From the link between real and digital space emerges a reflection on the concept of authenticity [18], as a direct comparison between a digitally constructed experience, as a setting of the atmospheric context, and the presence/absence of authentic elements, conceived as original.

Thus, with the aim of contextualising the case of the house museums in relation to the general topics of research, we first focused on the analysis of the literature review, concerning the change in the status of cultural heritage and the cultural spaces in general and in particular in the typology of the house museum, and thus how this is a premise for the entry of digital technologies in hybrid spaces through a seamless approach to understand the relevance in the context of the specific case under research. The methodology followed the analysis of case studies that can highlight the different applications of digital technology, focusing on the device, the type of narration channeled, and the interaction triggered, in order to map best practices in the design of the exhibition component of the house museums, underlining possible future scenarios.

2. Related Research

2.1. Museum as “Sensescape”

The integration of digital technologies, as a prompt for the development of relational experiences, is achievable, considering the recognition of the openness of cultural spaces to a re-interpretation and re-contextualization of cultural heritage, within the space. Central is the mention to the Unesco Convention for the Safeguarding of the Intangible Cultural Heritage, in which the intangible component of cultural heritage is defined not only in relation to “practices” but also as “the instruments, objects, artifacts, and cultural spaces” [19], considering the value of everyday objects of expressing fragments of everyday life, in the view of the relational power of the objects, as an intrinsic implicit or explicit narrative potential [20]. Symbolic is the case of the Ettore Guattelli Foundation in Ozzano Tano, which is on display a collection of rural objects from the 20th century, collected since the 1970s, as representations of territorial knowledge. The objects are displayed occupying the entire surface of the walls, blurring the thresholds of container and content. “By relying on the ability of objects to establish a relationship of physical-emotional proximity, [...] the common object, anonymous in origin but intimately familiar, in a recognised ability to evoke and recompose historical memory, is exhibited, offering the visitor a significant opportunity for sharing and recognising identity, both on a human level, [...], and on a historical level, referring to the heritage of knowledge and practices that produced it” [21] (p. 70).

Therefore, cultural heritage moves towards a dimension of a process, as “a becoming set of goods to be ‘put back into circulation’, reconstructed in their meanings, recollected in a social space of exchange—a resource for reflection, questioning, recognition, representation, emotion, growth, and putting back into play” [22]. In this frame, the updating of the definition of a museum, by the assembly of Icom, emphasising the need to display

“varied experiences” [23] with the participation of the community, referring precisely to the necessary interculturality and polyphony of the positions expressed as an immaterial dimension beyond what is visible, is understandable.

Classen & Howes referred to museums as “sensescape” [24], assuming that the culture of origin of the artworks could influence the fruition of the culture that physically display. This means that not all objects can be understood exclusively by sight, but some require a ritual and bodily approach, linked to the culture of origin. Consider the exhibition *Our Colonial Inheritance*, curated by Kossman deJong at Tropen Museum in Amsterdam, an overview of the influence of Dutch colonialism on the development and culture of various subordinate countries, prompting visitors to go beyond the known history. Within the section slavery, resistance and resilience, the installation “*du feasts and tambù*” displays objects related to the *du feasts*, a celebration conducted annually on plantations in Suriname, in which through the use of African drums and dances, slaves manifested the opposition to their condition. The visitor is invited to interact with the instruments on display, activating the sound, within a circular structure, in which to feel immersed in that collective rituality, as if to be part of the orchestra of overlapping sounds, participating in the dance as in a performance (Figure 1). Would it be possible to understand the value of those objects without experiencing the sound of the ritual?



Figure 1. Installation “*du feasts and tambù*” (photo: Rick Mando).

The push for involvement also opens up a further reflection on the possibility that museum experiences go beyond the museum itself, influencing everyday life and representing a field of assimilation of experiences expendable in socio-cultural relations through a process of *re-framing; re-seeing and re-enacting* [25] the inputs present in the museum experience, which are then re-contextualised in actual world.

2.2. House Museums as Embedded Authenticity

If, therefore, museums open their collections to multisensory and polyphonic visions, intending to display the immaterial component of the artworks and trigger experiential processes of involvement of the visitors, the topic, declined in the case study of house museums, takes on a configuration that allows broadening the terms of research.

House museums are representations of a historical cross-section, as “glimpses of the way individuals lived in the spaces we preserve” [15] (p. 75), of which they evoke

the rituality, linked to space, as the ability to express from the intimacy of the domestic environment, the familiarity of behaviours and gestures, typical of a lived environment. There is a dual level of narration: one socio-cultural, linked to past practices and knowledge, to be read in the space and objects on display; the other strongly humanistic, connected to the personal stories of those who have personally experienced the environment. The house museum in its entirety is considered a *historical artefact* [16] in which content and container correspond, to the point that, unlike other types of museums, such as contemporary art museums, the focus is not so much on the individual artwork but on the whole, on the ability of the whole to trigger a sense of belonging to the space, immersing the visitor in the atmosphere of a past period or stimulating a feeling of empathy, almost familiarity, with the people who inhabited the space. This is even more readable in the need to preserve the space, as if to say that only by faithfully preserving the objects, placed in the setting of the past, can we read that sense of authenticity, which is one of the strong points of this type of museum.

In this direction, the house museum of Joan Soane, where the architect lived since 1792 and which after his death in 1837 was declared a museum, represents a fascinating antecedent in the understanding of the evocative meaning of the house museum.

The house of Soane stands as a symbolic project of the idea of architecture to be transmitted to posterity, organised in rooms celebrating the “union of architecture, sculpture, and painting” [26] (p. 1) as a three-dimensional palimpsest of objects, in which “Time and space dissolve through this explorative choreography. Knowing that one place starts and the other stops is blurred knowing; moving through three levels and numerous rooms is both a singular and a simultaneous experience occasioned through windows, mirrors, openings, light and shade” [27] (p. 8). The point is that the architectural and exhibition configuration are not separable, just as they are orchestrated by a rewriting of space-time coordinates, in which the project of space corresponds to the project of time. In the space, the scanning of the movement of visitors is guided by two principles: circumnavigation time, as an extension of the crossing of space, in a mechanism of expanding the waiting for the artwork; space-time synchrony-asynchrony, triggering simultaneous connections in space and anticipating or delaying visions, using figures typical of literary language (such as prolepsis and analepsis) in the construction of architectural space [28].

Thus, entering the house is an exercise in re-reading space according to the author’s perspective, immersing into his story time, disorienting in the vertiginousness of the collections, yet precisely designed so that the dilation or extension of time represents the exact understanding of the spatial location of the artwork.

Soane used the planimetry of space as a system of signs capable of triggering a narrative from the space itself, in a way anticipating the theoretical approach and the main objectives of the research topics, such as seamless technology, the hypertextual activation of space, the multimodal bodily involvement of the visitor, through a layer that stems from the context and is inconceivable separate from the context itself. In this direction, it seems that according to Soane, the experiential and narrative dimension of the project is to be found in the intricate transition between spaces, as a stage for the display of objects, unfolded as a drafting of a literary text. This approach thus represents a theoretical reference to be followed in the fruition of cultural spaces of historical value, such as house museums, for the priority given to the expression of space as a communicative and socio-cultural catalyst and for the need to involve the visitor in the exploration of the space. In a way, it almost seems as if Soane has demonstrated that the narrative overwriting, nowadays entrusted to the use of more invisible technology, could be realised in the project of the space itself, relying on multiple and simultaneous visions of objects that in principle are unconnected, slowing down or speeding up the path of the space, such that the space is the exhibition and the exhibition is the space. However, not all spaces can speak through the architectural project, and therefore the synergy between space and visitors, amplified by digital technology, makes it possible to animate an immobile ambiance, without affecting

the historical value but rather emancipating from a rigid ceremonial toward a dimension of active bodily involvement of the visitor.

If, therefore, the topic of the display of a system of objects is functional to relieving the experience of space as a capacity to express meaning beyond space, this involves wondering how the topic of the authenticity of space can influence the whole perception.

Wood [18] in particular analyses an overview of the difficulty of arriving at a univocal definition of authenticity, bringing into play the debate between a view of staged authenticity, as a condition set for touristic purposes [29] and which nevertheless assigns a centrality to the objective space rather than to the visitor's perception, and a problematisation expressed by Wang, between the authenticity of the object and the authenticity of the lived experience, as an opposition between *constructivist* and *existential authenticity* [30], laying the foundations for what will be defined by Dueholm and Sned as *Theoplacity*, in the sense of "a compromise between real and imagined states of an object or place" [31] (p. 288). Thus, the difficulty in unambiguously framing the meaning of authentic is explained by considering how much individual experience and background can influence the view of an object, whose authenticity is filtered not only by individual perception, but also by different cultural perspectives and interpretative transformations over time. In the case of house museums, authenticity seems to be linked more to the recognition of a collective ritual, like entering into a memory of the past, regardless of the originality of the collection.

A further point concerns the current life of the house, underlining how the continuation of the living dimension by members of the family triggers a complexity and continuity of space between past and present as if to represent the adaptability of past practices in the contemporary dynamic.

2.3. Seamless and Affective Design Approach in the Hybrid Environments

The use of a seamless approach [16,17] within house museums is framed as a balancing of the mutual relationships between space, digital technology, and visitors. Seamless means using technology, ensuring the preservation of the space, overlaying a subtle layer that may neither hide nor dominate the space, but represent a digital amplification. This approach allows to engage with the space itself, avoiding a screen or button-based support, which may fall into the heads-down phenomenon, isolating the visitor in the relationship with the device, detached from the context narrative. Classie et al. extrapolated design principles for the construction of experiences in house museums, linking the topic of seamlessness as functional to the maintenance of the spirit of the house, to the construction of a domestic nature, and to the telling of stories about, for and by people [16].

Thus, if the topic of seamlessness is not to be considered as an absolute principle, but as related to the ability to design the ambiance, transferring the atmosphere of the house and triggering relationships between the visitor and the space, then it is not always true that the physical shape of the device is a limitation to a direct relationship, but rather at the center is the ability to involve the visitor in the exploration of the space and therefore the design of a digital layer, which regardless of the visible or non-visible dimension, is able to stimulate a profound contact with the context.

The seamless approach is, therefore, all the more effective when integrated into an exhibition system, which, starting from spatial awareness, is capable of expressing different levels of narratives, at times coordinating an interactive-informative level as a story-based filter, with an emotional system based on an almost natural direct link with space. In this sense, are calibrated both wearable and non-wearable physical devices and systems integrated into space, in an invisible dimension.

The focus on the stimulation of the emotional dimension in the visitor also responds to a more general approach of the affective turn, taking into account in the design of digital technological systems not only a behavioural, as a cognitive process linked to the resolution of practical problems, or a reflective perspective, as the ability to rework experience, but the *visceral* dimension, understood as "how we react to sensory i.e., what can be perceived by our senses: visual, acoustic, tactile, taste or olfactory" [32] (p. 806). This means considering

sensory stimulation as a tool for the knowledge of the world, such that the use of multimedia digital devices is interesting above all from the perspective of multimodality [33], as an overlapping of complementary and convergent systems [34], such as to convey a multisensory perception, which allows to experience the complexity of cultural heritage, using the different senses, towards a dimension of natural and familiar gestures.

Sensory perception is declined in bodily involvement, considering the body as a relational mechanism for understanding the world [12], such that one perceives the own place in the world thanks to the presence of others, where “exteroception is accompanied by proprioception” [35] (p. 133). Thus, the technological medium is not only a communicative tool, as a vehicle of information but is to be considered as an extension of the body and of sensory systems, such as to play a central role in the transformation of perceptual harmony, orienting in one direction or another the hierarchy of the prevailing senses within the reference society and thus directly acting on the construction of cultural and social practices [36].

Based on these considerations, the topic of integrating digital technological devices into physical spaces of culture assumes a central role precisely in the dimension of synesthetic involvement of visitors, using the interactive and narrative capabilities of digital technology as an explication of the emotional dimension of the space and the artworks on display.

The transformation of physical spaces into hybrid spaces [4–6] translates into the design of environments in which physical and digital devices are configured as assemblies, in which the real space and the digital overlapping “work together as part of an overarching narrative or activity” [37] (p. 29).

The need to define the theoretical coordinates of the topic of hybrid spaces then led to different declinations, pointing to guiding principles that could drive the reciprocal relationships between the agents in the field: Lange et al. speak of blended spaces [7], articulating four layers to be evaluated in the design of blended experiences: the pre-existing motivations; the relationship with the location; the narrative and the actions conveyed, considering it as a sequential process to be followed for blending experiences into the museum pre-existence; Benford et al. in referring to the hybridization consider that the main element is the design of *trajectories*, as a mechanism for understanding and designing interactions in hybrid spaces, capable of orchestrating journeys through a coherent system, which holds narrative, space and time together: continuous trajectory, an engaging path, in which “trajectories appear to be continuous, extending backwards in time to reveal a coherent history of experience, and forward in time to suggest anticipated routes and possible future actions” [4] (p. 711).

The term *phygital* was coined in 2007 by Chris Weil, president and CEO of the Australian agency Momentum Worldwide as a crash of the words physical and digital, and with reference to the IoT “which refers to connected objects that trigger a physical reaction from a digital action or a physical sensor that when triggered, results in a digital output” [38]. Recontextualisation in the field of cultural heritage translates into the exaltation of the ability to stimulate processes of meta-materiality [39] of deep perception of space through the gestures, as a reaction to the digital device. Nofal et al. spoke of *phygital heritage* [11], defining through the concept of affordance, as an invitation to use, an intrinsic property of the object, capable of generating direct user action [35] and situativity as a relationship with the context, as criteria for classifying related technologies, emphasising two central elements in the design of *phygital* experiences.

The construction of hybrid spaces relates to the use of *mixed reality*, which can be defined through the “virtual continuum diagram” [40], as a continuum from the real environment to the virtual environment, as median experiences between the *augmented reality*, in which the real environment is increased by overlapping digital information, and the *augmented virtuality*, through which the virtual environment is increased by overlapping direct representation of reality [41]. Within the digital technology of *mixed reality*, central is the reference to *tangible interactions* [42], in which visitors interact by manipulating tangible objects or by making actions through gestures or the whole body. The focus is in the first

case on the *embedded interactions*, as smart objects, in which the technology is embedded, and in the second on the *embodied interactions*, considering gesture and body movement as the activator of the sensitive environment [43].

3. Case Studies

In the selection of case studies on the topic of house museums, the focus of interest is the evocative capacity of the space in relation both to the previous life of the house and to the internal spatial characteristics and the territorial context in which it is located.

Therefore, the aim is to map cases of house museums which, precisely because of the differences in internal spatial arrangements and socio-cultural and territorial location, can highlight the transversality of the topic, and thus represent a field of experimentation for the use of digital technologies.

The selection of the case studies, based on the considerations that have emerged from the literature review, outlines a framework of subcategories of house museums in order to be able to examine the potential of the integration of advanced technologies at different levels and in various contexts. The inseparable link between the history of the house, the space, and the territory highlights the need to incorporate technology on a subtle level, preserving and animating this connection [17]. From the house of Pirandello as his personal journey to the courtly events of Venaria and the Markiezenhof palaces, from the behind the scenes of Denmark's most influential literary circle in the Bakkehuset to the staging of late 19th-century rural society in the Greve Museum, the cases emphasise the strong link that the previous life of the house establishes with the current configuration.

In this sense, the criterion of selection of the case studies is related to the investigation of widespread scenarios, in which the use of digital technologies can amplify the experience of the house museum: from the use of wearable devices as a narrative trigger of the spatial context (House Museum of Luigi Pirandello), to the enhancement of the gesture of touch, through smart replica, as feeling part of the rituals of the house (Markiezenhof; Greve Museum) to the integration of light and sound projections, letting the space itself talk (Venaria Palace; Bakkehuset).

When comparing digital scenarios, it is relevant to refer to the difference in interior spatial arrangements: from particularly intimate places, in which the presence of objects clearly expresses the connection with the past, even more so when the absence of a famous protagonist gives way to the memory of a collective heritage lost in the traditions of the past, to houses in which the magnificence of the architectural space seems to prevail over the internal narrative dimension, often accompanied by empty rooms, which demand to be told.

Furthermore, the life of the characters on stage is closely linked to the territorial context, influencing city life far beyond the walls of the house and palace, and this is evident at different territorial levels: from the way of life on a farm of 800 in the village of Greve on the outskirts of Copenhagen to the encounters and habits of the exponents of the Danish golden age, in the Bakkehuset in the centre of Copenhagen; from the influence of Pirandello in the city of Agrigento to the storylines of the nobility impacting the life of different territorial contexts such as Markiezenhof, the palace at the heart of the city life of Bergen op zoom, or the palace of Venaria, which, despite the decline and transformation of function over time, represents a glimpse of a great European court.

Thus, by mapping on the basis of the current digital scenarios, interwoven with the previous life of the house, the spatial configuration, and the relationship with the context, we aimed to outlining an overview of current scenarios that emphasises the use of digital technology in a new seamless awareness, setting up the basis for novel applicative systems.

3.1. Criteria of Analysis

The analysis of the case studies is filtered by three criteria: the type of device; the narrative filter; and the involvement of the visitor in the storytelling.

Focusing on the type of device used means, first of all, investigating the relationship with the spatial context on the one hand, and with the visitor on the other, distinguishing: wearable devices, connected to the space through, for example, Bluetooth low-energy devices and capable of overlaying a visible information and narrative layer, activated by visitors, i.e., devices integrated into the space [11] referring to tools of ubiquitous, invisible technologies, and contextualised above all in the sphere of *tangible interactions* [42,43], such as smart objects, as embedded objects, or embodied sensitive environments; diffuse devices, such as immersive sound and light projections, perfectly incorporated in the space, such as to guarantee the fully situativity of the narrative, but not a direct interaction of the visitor through the bodily gestures.

The criterion of the narrative filter focuses on two types of narratives: on the one hand, the evocation of a historical period, relying on habits and knowledge of the past, which is more emotional as it is rooted in memory, through environments that make the space come alive; or the intimate story inside the house, through a mechanism of identification in a specific character, and thus feeling part of that narration [44].

The level of involvement of the visitor from a dimension of individual participation, as an intimate and direct link with the spirit and atmosphere of the house, moving towards a dimension of collective rituality, indicating in the sharing of the moment a way of animating the space as an opportunity of encounter and dialogue with others [45].

3.2. House Museum Luigi Pirandello: Wearable Device as Narrative Trigger of the Spatial Context

The House Museum of Luigi Pirandello is located inside the writer's birthplace, in a late 18th-century building in Agrigento. The project for the renovation in 2021 aims to enhance the evocative power of the works of Pirandello, through the valorisation of the objects and the space of the house where he was born, as a landscape of the author's memories, highlighting the indissoluble link with the city of Agrigento.

The narrative is filtered according to a journey through the life of the author, such that each room retraces a stage in his personal moments, as a way of getting intimately close to the writer and understanding the context in which his works were developed. The route winds through six rooms, set up by multimedia and immersive installations, grafted into the space between originals and reproductions: from the display of paintings by the author at the entrance, to the landscapes of the soul and the Janus Bifrontes and the filter of Pirandello dualism, which guide the cinematographic and theatrical production. Next, the visitor enters the room where is on display the Greek vase in which Pirandello's ashes travelled between Rome and Agrigento, animated by an immersive projection that recounts the events of the life of the author. The following room is dedicated to an immersion in the notebooks and words, through a reproduction of the writing desk that belonged to the author, in an interactive table where digitally browse through his notes. In the last room, is on display the topic of the mask, through virtual projections.

Ett spa developed an app that accompanies the visitor along the path with multimedia and augmented reality content, superimposing a narrative layer in the space, that guides the visitor to discover the installations, which are integrated into the space according to a dual perspective: the presence of the original is amplified by the digital layer; the digital layer is necessary due to the absence of the original.

In the last room, it is possible to wear the mask via the app, as if to enter into the most representative concepts of the poetics of Pirandello.

Although it is a complex installation system, with the use of a coordinated design using different technologies, the presence of the app draws a filter of the space, which is strongly linked to the context, like a subtle guide, accompanying the visitor in a space that travels between the authentic constructive and the authentic experiential. The storytelling of the space, which is set on the original spatial layout, is filtered through the life events of the author, as to understand the context of the literacy production. On the other hand, the experience tends to be individual, through the use of the app.

3.3. Markiezenhof-Greve Museum: Touching Smart Replicas as Feeling Part of the Rituals

The topic of smart replicas, as a digital layer embedded in objects, is of particular interest in house museums, precisely because of the ability to emulate the relationship with the original, thus opening up the question of whether the ability of the replica to orchestrate a recontextualisation of the atmosphere of the artwork is as authentic as the direct experience of the artwork itself. In addition, the integration of a digital layer, embedded in the device and connected to the space, allows the involvement of the visitor, activated by direct contact with the materiality of the object. In this sense, the comparison between two projects in the field could lead to different reflections.

Inside the Markiezenhof palace, the oldest palace in the Netherlands, built in the 14th century and located in Bergen op Zoom, the aim of designing an alternative narrative to the exhibition system of four period rooms, is conducted through a multimedia project, which is grafted into the space, maintained in the original configuration, using the filter of a story, set within the palace walls. The space, as a historical residence of nobles, thus follows the love affairs of the Marquise Marie Anne Van Arenberg and her family, amplifying, through 12 points of interest, the space itself as a narrative backdrop for the different phases of the storytelling.

The project involves different devices: from smart objects, whereby the visitor by touching the replicas activates the story, to the use of sensors, through talking objects (Figure 2a), to physically involving the visitor in the story, inviting them to sit at the table at a family reunion, animated by moving objects and the voice of the characters, together with other visitors and to be part of that moment (Figure 2b). The narrative is an escalating climax, up to the point where the visitor can choose which character to side with, signing up for the story to end one way or another, until they find out how it really went down.



Figure 2. (a) Talking painting; (b) the family dinner (photo: Alessandra Miano).

This is because at the core is the ability to bring the space back to life through the filter of an unknown story capable of animating the space in the spirit of previous life, albeit in a dimension of verisimilitude, establishing an intimate relationship with the characters in the stories. The strategy follows on the one hand the recontextualisation of the actions in the rooms, linking the plot to a precise space. This allows the visitors to engage in an identification mechanism, moved in a double track between a recognition scheme,

providing them with the spatio-temporal coordinates of knowledge, and the surprise, accentuated by the dramatisation of the actions [46].

On the other hand, the project at the Greve Museum, an old farmhouse arranged as a farm in the 1800s, is developed by focusing on a room used for celebrations and mourning. Faced with the fact that visitors could hardly understand the function of the room, the installation gives the word to a Niels ghost, who had inhabited the house between 1797 and 1870. The digital installation of a diary, through which the ghost communicates, is in direct connection with the selection of three smart objects, representative of symbolic objects of life in the house, and at whose touch the ghost tells anecdotes, writing in the diary. The point the authors make is that despite the filter of the narrative and the involvement of the visitors, the lack of contextualisation of the objects, brought on the table but not placed in the space, creates a sense of detachment and does not stimulate the exploration of the space itself, losing the reference to the understanding of the environment in its entirety [47].

3.4. Venaria Palace-Bakkehuset: Let the Space Talks

Inside the palace of Venaria, the project, *Repopulating the palace*, directed by Peter Greenway, recounts the experiential dimension of the space through a cinematographic sequence developed in eleven rooms along the visit route and divided into three major themes, adopting, for each, different artistic and technological solutions. In *The Presentation of the Court*, the word is given to the characters who inhabited the palace, aimed at recreating the atmosphere of the past through the narration of 10 emblematic personalities who symbolise court archetypes; in *The Kitchens*, the absence of elements indicating the functions of the space amplifies the role of the technological level, from storytelling to artwork of art [48]. Through 20 transparent screens, coordinated by a central screen representing the cooking realm, is staged the chaotic nature of the environment, as to recreate, using light, sound, and projections, the overall atmosphere of the space. Wall projections animate the third act, *The Court Procession*, in which court figures parade in different historical moments, accompanied by a background buzz of comments and gossip.

The diffuse dimension animates a narrative which, while starting from specific characters, aims above all to represent the atmosphere of the past, through involvement in a collective ritual, which the visitor shares with the others present.

On the other hand, we consider the Bakkehuset in Copenhagen, a former farmhouse from the late 1600s (Figure 3a,b), inhabited in the early 1800s by Kamma and Knud Lyne Rahbek and a meeting place for authors and scientists such as H.C. Andersen, Adam Oehlenschläger, H.C. Ørsted, N.F.S. Grundtvig, B.S. Ingemann and Johan Ludvig Heiberg. The aim of animating the space, through a seamless design approach and recreation of a soundscape, is achieved through the integration of speakers, which could enliven the space, focusing not so much on the individual protagonists, but on the environment itself. Thus, short conversations or sounds are transmitted as coming from the space, giving the idea of being real-time. In fact, the focus was placed precisely on the ability to simulate the authenticity of the sound, with attention to volume and positioning, also excluding excessively long conversations that would have monopolised the attention on a single narrative strand and not on the perception of the space. The use of a sound layer makes it possible to stimulate a sense of belonging to the space, acting on the emotional involvement deriving from the familiarity of certain sounds, in a dynamic that is configured as a collective [7].



Figure 3. (a) General view of the entrance; (b) The living room (photo: Alessandra Miano).

4. Conclusions

The excursus unfolded through the literature review highlights a change in the consideration of cultural heritage, finding in the intangible dimension the potential to stage not only the behind-the-scenes of the artwork, such as the context and related rituals, but to look at objects of everyday life [21,48] outside the traditional artistic circuit. Thus, these anonymous objects convey the territorial and socio-cultural component belonging to the past heritage, staging behaviours and gestuality, so as to prompt a feeling of recognition, nostalgia, and awareness of the present on the basis of past practices. These objects are able to express a relational capability [20], to contain within an implicit narrative, which needs to be made explicit, recontextualised in order to be adapted with mechanisms that can influence the perception of the present. Furthermore, it should be said that the expressive power of the artifacts lies above all in the setting in the original context as if reliving that moment in that place. This experience of the visitors is strongly influenced by their own background, as a mix of personal and socio-cultural expectations [49], and aims to bring this insight outside the museum sphere, turning the cognitive experience into a transformative experience [25], individual or collective.

Therefore, we mentioned the tension expressed between conservation and activation in the world of museums as to push towards the *sensorial turn* [3], and the *affective turn* [32], as fruition no longer only oculacentric but also such as to activate different senses [13], meaning the interest not only in didactic knowledge but in the ability to emotionally affect the visitor, stimulating the senses, and establish multimodality as multivocality of positions around the artworks.

If this is the general tendency, functional to the fruition of the intangible dimension of cultural heritage, house museums are a central reference for the capacity of the space to express that relational dimension entrusted to the single object, setting the space itself as the main object of the exhibition [16], stimulating an all-encompassing narration. On the other hand, the awareness of a space that was alive requires the display of the spirit, accentuated moreover by the intimacy of the domestic dimension, and such as to develop in a double track, between the symbolic reference of that space, as a glimpse of the era in the past, and the link with the personal vicissitudes of illustrious personalities.

Therefore, with respect to this need for preservation but also for reactivation, the integration of multimedia projects, investigated through the criteria of device, storytelling, and interaction, makes it possible to extrapolate considerations, which are central to the design of hybrid digital technological systems.

The first topic is that the evocation of the spirit of the house, in the sense of atmosphere or personal story, works the more it is connected to the space itself, such that it is the overall configuration that makes the space authentic, rather than the individual object. On the other hand, the use of a seamless approach of digital technology allows the visitor to relate directly with the space, being able to grasp the spirit, through the integration of devices, which, in a different gradient of visibility, can explicate the experiential dimension as a symbolic space of evocation of the past.

Thus, in the use of apps, the presence of a physical device could represent a limit to an immediate relationship with the space, inducing to look at the screen, taking the visitor out of the space, as to curb the growing desire to get rid of mobile devices, and the fruition of the space in an unmediated way, in a general need of *digital detox* [50]. On the other side, the bodily engagement ensured through smart objects thus directing a tactile and gestural relationship, allows one to enter into the domestic dynamics of the house, as if to be part of the story at the moment of life, practicing gestuality and rituals from the past. It's important to say that the use of an integrated and synaesthetic approach capable of triggering a natural dimension of participation, if not reinforced by a narrative filter, could fall into the risk of working on stimulation of emotion, but neglecting the reliving of the experiential dimension of time and space. This tendency is even more pronounced in the case of diffuse technologies such as projection mapping or sound installations, here if it is true that there is a maximum exaltation of the material dimension of space and works, through a layer that exploits space itself as a support, it should be said that the topic of immersion, if it becomes spectacularisation [51] for its own sake, can represent a danger to the narration and involvement of the visitor.

However, what stands out from the case studies is that the ability to encourage exploration of the house is not always linked to the formal dimension of technology, as an app can also bring into play interactive dynamics capable of re-experiencing the space.

A second point emerges from the possibility that the narrative filter gives prevalence to the space, as an expression of a socio-cultural practice of the past, or instead focuses on the personal history of the characters who lived there. In both cases, the staging of the humanistic component guiding the atmosphere of the space is a central point: in the case of the overall spirit of the space, by giving a word to those who lived in the space, and thus by using secondary characters usually not involved in the narratives; in the case of identification with the personal stories, by not concentrating on known biographical events, but instead by telling an unknown story, which may reveal a hidden and intimate part of the protagonists.

The last point concerns the possibility that the visit is experienced as an individual immersion, stimulating the direct relationship between space and visitor, or that as a collective ritual, such as to represent a place of confrontation, dialogue, and exchange of positions. The embedded link with topics of intangible heritage, such as practices and rites from the past, as shared or not by successive communities, seems to indicate in the house museum a space that lends to stimulating a relationship with others, pushing the collective dimension as a moment of sharing and living together the spirit, but also of safeguarding the space and the past traditions.

Therefore, the main focus of the research is the question of whether digital technology can in a seamless dimension, as to "refer to the careful and subtle integration of digital elements into the original historic environment" [17] (p. 4), be functional in amplifying the experience of house museums, such that it does not distract attention from the context, but rather pushes the exploratory capacity of visitors. The paper outlines how there is no single answer, but that the complexity of the architectural and socio-cultural context imposes a broad reflection, on the knowledge of the life of the house, on the links with the territory,

such as to stage a story that can showcase the historical value, to the point of substituting where necessary the very presence of the original, towards an authentic experience [18].

The fruition of the contents in the house museums travels within a tension between poles, between conservation and activation, rigid rules of behaviour and bodily involvement in the rituals and practices of the past, from looking from afar to touching, from being outside to being part of the story. In this dimension, the position of digital technology is also split with respect to the contents to be conveyed and the interactions connected, between the need to communicate the historical and cultural dimension of space and that of exploiting a synaesthetic experience of bodily involvement, between the physical devices and the invisible integration, between conveying a known univocal position and representing a multivocality of viewpoints, between the cognitive-behavioural and the emotional dimension, stimulating that feeling of belonging to a space of the past.

Among these poles, the paper, drawing on the positions expressed in the literature review, and on the other from the analysis of case studies, extrapolates points of reflection. The first is that digital technologies in the hybrid and seamless approach push the relational potential of the space, starting from the space itself, "It is not technology that must provide the surprise effect, but what the artwork is able to tell involving the visitor" [1] (p. 1). So, past or present stories inside the house guide the choice of digital technology, with regard to the possibility of giving more emphasis to a glimpse of a time, not focusing on a direct character, or on the contrary telling an intimate dimension of well-known personalities, beyond the traditional bibliography. In this sense, it is important to take into account the expectations of the visitors, emphasising how the co-existence of different tools represents a fluid scenario, capable of balancing the communication of traditional and known knowledge around the artworks, with the behind-the-scenes experience, searching for stories that can contribute to an overview of the space and the characters, revealing hidden details or secrets. It is no coincidence that, especially with respect to smaller territorial contexts, the account of volunteers and their participation overlaps with the direct curatorial dimension, as if to emphasise the unbreakable link with the knowledge of the community.

The ability to push the exploratory dimension of the visitors, leading to physically cross the space, reliving the spirit and stories, is built through hybrid digital systems, meaning that "integrating technology into material objects instead of creating a parallel and detached digital experience" [52] (p. S2908). This works on a double track: amplifying the experience of the original, bringing it to life through storytelling; amplifying the authenticity of the experience, starting from the simulation of gestures and rituals, using non-original objects but perceived as authentic, because contextualised in the space itself.

If therefore the seamless and hybrid approach seems to represent a trend of potential application scenario, on the other hand, it should also be pointed out possible limits and difficulties in the design of the digital layer in the house museum. The first point is the strong link with the space, which seems to represent a considerable difficulty in conceiving application models that can be adapted to different contexts, both in the design phase and in the evaluation phase. Furthermore, the involvement of different project actors—from curators, to designers, to volunteers—makes the process complex due to the coordination and expectations of the different parties, balancing the awareness of the space by the territorial community, the evidence of the historical facts, and the experientiality and verisimilitude of the narrative, conveyed by digital technology, for the purpose of engagement. Indeed, it should also be noted that there is a lack of specific literature in the sector, as the topic of house museums is often unrelated to the dimension of the use of digital technologies, and more rooted in the issue of conservation and management of the space. Furthermore, the topic of seamlessness does not rely on literature related to cultural heritage, linking instead more to the topic of the consumer shopping experience.

Starting from the consideration of the limits, it is possible to indicate possible future lines of research: both in terms of co-design projects within the house museums [52], and exploiting the possibilities of categorisation of different types of house museums, to

outline sub-categories that highlight elements of continuity between the different cases, differentiating digital scenarios as possible future application models.

The opening up of the literature and case studies references, linking seamlessness to cultural heritage, although it does not rest on a large section of critical literature, seems to usher in the potential for recontextualisation, echoing similar processes seen for instance in the case of *phygital*.

This paper aimed to highlight the current basis in this field, starting from the critical re-reading and relocation of the literature and case studies in a more focused and up-to-date scenario, which could develop some of the emphasised developments (wearable devices as a narrative trigger of the spatial context, touching smart replicas as feeling part of the rituals and letting the space talk) as application scenarios, to be developed in the future of the fruition of house museums.

The continuation of the domestic space, at times even animated by the presence of the generations that inhabit it, is grafted into a narrative circuit, which makes visible the immaterial potential of the space, as values, gestures, and practices of the past, but also as practical objects in themselves, representative of the spirit of a socio-territorial community.

House museums, according to this approach, are delineated in a dimension of living history museums, “... strive to recreate that indefinable ‘sense’ or ‘aura’ of the time period, of what it could have been like to live back in the day. They stage a version of lived reality that can be accessed only through embodied presence and lived experience of the space and materiality of objects that it holds. A living museum necessitates the activation of all senses, a state of alertness to the uncontrollable world around us. While in a traditional historic museum, one may close his/her eyes to block him/herself from the world, in a living museum, the smells, the movements of air, the creaking of the centuries-old floorboards under one’s feet, conversations of the visitors, and the working of a frequently present printing press will prevail despite the shut eyelids” [53] (p. 2).

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