

From Interpretation to Immersion: XR and the Transformation of Fashion Heritage Storytelling

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Abstract

Brand heritage is a fundamental element in shaping fashion brands' identity, encapsulating narratives of craftsmanship, culture, and legacy. With the rise of Extended Reality (XR) technologies, new opportunities emerge for preserving and communicating these narratives, redefining how brands engage with their audiences. This study explores how XR enhances fashion heritage storytelling by facilitating interactive and immersive experiences beyond traditional archival and marketing approaches. Grounded in Riviezzo definition of brand heritage activities [RGN16] and Mosca's heritage factors for brands' storytelling techniques, the research examines XR applications across five key dimensions: (1) historical evolution, (2) influential figures, (3) craftsmanship techniques, (4) reissues of iconic products, and (5) architectural spaces emblematic of brand identity [Mos17]. Through case studies, the paper demonstrates how XR transforms storytelling into storyliving, fostering deeper audience engagement with historical garments, artisanal techniques, and brand histories. Additionally, it envisions future scenarios where XR and AI-driven personalisation expand the possibilities of brand heritage, integrating multisensory interactivity and user-driven narratives. Positioning XR as an instrument that crosses between tradition and innovation, this study contributes to discussions on the phygital transformation of fashion, offering insights into experiential approaches to brand heritage preservation and engagement.

1. Introduction

Brand heritage is a fundamental element in shaping a fashion brand's identity, as it condensates narratives of craftsmanship, culture, and legacy. The heritage produced and preserved by fashion houses is both material and immaterial. It consists of multi-material collections, the knowledge of their artisans and creatives, the traditional and characteristic techniques, campaigns for their communication and public appearances. Most of the time, these are neither organised into archives nor open to the public or the people working in the field, such as creatives and students, because brands and production houses are often unaware of the cultural potential of their collections and do not invest much in preserving their valuable legacies. However, in recent years, a new generation of scholars and industry experts has rediscovered the potential profit contained in intangible heritage, which, when leveraged effectively, represents a valuable source of differentiation from competitors [RGN16]. In addition, fashion heritage can be considered part of cultural intangible heritage, which has been defined as a set of resources inherited from the past that a group of people identify with, regardless of who owns them, because they reflect and express values, beliefs, knowledge and traditions that are constantly evolving [leg20], and that are relevant for the community in addition to the sector's specialists. According to these premises, the process of sharing culture, knowledge and skills is considered a fundamen-

tal passage of the process of the consumer's experience of fashion heritage, which can also be better preserved in this way. As technological advancements redefine consumers' habits [FGSB18], Extended Reality (XR) technologies emerge as powerful tools for preserving fashion heritage narratives and making them public. Moving beyond traditional archival and marketing approaches, this research explores how XR technologies facilitate immersive and interactive fashion applications, following Riviezzo classification of techniques of heritage marketing [RGN16], focusing the attention on heritage factors defined by Mosca [Mos17]. This study adopts a case-based methodology aimed at tracing current and potential uses of XR technologies in fashion display. Rather than offering a comprehensive mapping, it focuses on meaningful experiences across both commercial and museum contexts, which exemplify the transformative potential of immersive technologies in reactivating and communicating fashion heritage. This paper addresses the following research questions: (1) How do XR technologies reshape the storytelling of fashion heritage in both commercial and institutional contexts? (2) What strategies of display, interaction, and engagement emerge from current XR applications? (3) In what ways can immersive media foster new models of co-creation, access, and memory in fashion heritage? By integrating theoretical insights from heritage marketing and cultural studies with the technological affordances of XR, this study proposes a hybrid analytical

framework to examine how storytelling becomes *storyliving* in the digital fashion domain.

2. State of the Art

2.1. Fashion as Intangible Cultural Heritage: Challenges of Access and Preservation

Building on an expanded definition of cultural heritage – one that includes not only the traditional arts, cinema, theatre, dance, music, and ritual practices but also fashion – it becomes increasingly clear that fashion plays a fundamental role in cultural expression. In its broadest sense, fashion encompasses local craftsmanship, social customs, etiquette, and the everyday habits of a community. As Salvatore Nastasi notes, a shift in focus toward intangible cultural heritage fosters a more inclusive understanding of cultural diversity and affirms the value of social practices as integral to a nation's cultural identity [Nas20]. Within this framework, fashion-related content and experiences should be recognised as essential components of a country's cultural heritage landscape. The main challenge then regards how to improve access to and engagement with fashion as cultural heritage. This entails both valuing cultural diversity and enhancing the quality and accessibility of services and experiences connected to fashion heritage. At least two interlinked levels of intervention can be identified: the systemic level, in which fashion brands and archives are designed to celebrate both tangible and intangible heritage; and the user level, where content must be made accessible to a broader public interested in engaging with it. Fashion, in all its complexity, is a key medium for identity narratives – constructed from stories, practices, objects, memories, and traces that are both material and immaterial. These deserve to be preserved and shared, even because although garments are often owned by individual brands, fashion is not the product of isolated genius. Rather, it arises from layered interactions between past and present, generational knowledge accumulation, and industrial districts' productive particularities [CC]. Ensuring its preservation and accessibility requires managing a wide range of interconnected data, artefacts, and locations. For this reason – and in light of the fragmentation of collections and the dispersed ownership of garments and documents – a single, centralised fashion museum may not be sufficient. Instead, what is needed is a dynamic and decentralised system of interconnected archives, both digital and physical, that supports thematic exploration and enables personalised, experiential journeys through fashion heritage. The focus may shift from a singular archive to a distributed and networked model – fluid, adaptable, and navigable across different formats platforms and locations. The main aim could be the creation of a transmedia ecosystem where every narrative element contributes to communicating the richness of fashion's tangible and intangible dimensions, and this would represent a step beyond traditional museum storytelling and static displays. With the integration of immersive and digital technologies able to produce multisensorial stimuli – such as sound, scent, tactile feedback, music, and dynamic lighting – it becomes possible to radically reimagine the way fashion heritage is conveyed. Ultimately, the complexity of fashion and the layered system that sustains it calls for a methodology capable of organising, sharing, and giving access to this multifaceted heritage. A multidimensional, cross-referenced archive of physical and digital

artefacts – linking different types of collections (public and private) and levels of information – could be key to this. The real value of such an archive lies in its ability to operate across disciplines and access levels, enabling broader engagement and interpretation of fashion's historical, cultural, and sensory dimensions. For several reasons, such an approach is not viable for the moment. Among them, is the fact that corporate archives, small collectors or smaller museum institutions cannot produce immersive and interactive storytelling experiences, mainly due to the current inaccessibility of technology, which is extremely expensive and requires highly specific knowledge. Given the challenges of designing a unified brand-driven archive at present, it is possible to explore how accessibility can be enhanced at the user level, drawing on innovative formats and experiences to activate and share fashion heritage.

2.2. Living the Heritage: XR and the Shift from Interpretation to Experience

Currently, there is broad consensus in categorizing technologies within the spectrum of Augmented Reality (AR), Mixed Reality (MR), and Virtual Reality (VR) under the umbrella term Extended Reality (XR). This continuum spans from systems that overlay digital content onto the real world to those that allow for complete immersion in fully virtual environments. XR technologies constitute a new generation of digital media designed to create experiences that engage users in a comprehensive manner, activating not only their senses but also eliciting emotional and social responses. This is particularly evident in VR environments, where the user is physically immersed in a multisensory space, most often involving coordinated visual and auditory stimuli. The level of immersion offered by XR depends on how precisely the system can replicate the sensory cues that, by stimulating the user's perception, deliver an experience resembling real life. The more these artificial stimuli are perceived as natural and realistic, the greater the sense of presence and immersion [GCM*22]. Full immersion is therefore achieved when virtual stimuli become indistinguishable from those of the physical world. This makes immersion an objective and technical feature of the system, determined by the capabilities and affordances of its hardware and software to construct believable simulations that stimulate perception as effectively as real-world inputs [Sla18]. Moreover, a higher level of immersion is achieved when the system allows the user's body to be integrated into the experiential space – as in the case of 360° videos that engage both auditory and visual senses and can evoke the sensation of inhabiting another body through the use of spatialised audio – rather than relying solely on a flat-screen interface where the virtual world vanishes from perception as soon as the user looks away [Sla18]. If immersion relies on the fidelity of the simulation, then a higher degree of immersion is inherently tied to an enhanced sense of presence within the virtual experience. When perception is mediated through the body, the brain's sensory processing mechanisms interpret the stimuli as if they were part of the actual environment. This results in a subjective illusion of “actually being there” [SSV16] – the individual's sensation of inhabiting the simulated space, even while maintaining awareness of the physical environment surrounding them. Since perception can trigger responses before the brain consciously recognises the virtual environment as an illusion, the sense of presence is also closely linked to users' behaviour in immersive ex-

periences, which often mirrors how they would act in comparable real-world situations [Sla18]. Therefore, immersive experiences are powerful tools for eliciting deep emotional responses, sometimes overshadowing narrative clarity. When sensory stimuli – visual, auditory, and haptic – are highly engaging, users prioritize presence over content, experiencing a strong illusion of “being there”, and as participants adapt to virtual environments, they embody in digital forms, whether avatars or assigned characters, triggering a *dual unity* [Mas17] between their physical and virtual selves. This embodiment heightens vulnerability and emotional openness, enabling new perspectives and empathetic understanding [GRS*21]. Especially in VR, where the image surrounds the user, sensory richness makes it impossible to look away [WBL15]. Once acclimated, users explore spaces through instinct and bodily engagement, discovering meaning via trial and error. Unlike film, where meaning is usually conveyed through the observation of a screen, immersive narratives are understood through lived experience. Participants shape the story through their actions, and identification with the virtual body enhances emotional intensity and presence. The combination of simulation, immersion, embodiment, emotional triggers and understanding generates a new status for the user in the immersive experience: from spectator to active participant in the narration of the experience. Therefore, it can be argued that immersive technologies shift storytelling from interpretation to enactment, making what the user feels and does central to the construction of meaning. This process transforms the experience into a storyliving event, which is also referred to as *storification* [AL07]. It creates a deeply personal and empathetic connection, as the participant comes to see the narrative as part of their own lived experience, storing it as an autobiographical memory. In such storyliving scenarios, the emphasis shifts away from the narrative itself and moves toward how users interact within and alongside the story – how they experience it from the inside, making it a meaningful, internalized event [AL03]. This shift in role for the user – from being a spectator to embodying an entity within the virtual world – has many consequences, for which the narration of heritage is shifting and potentially allowing more activating and personal fruition of content.

2.3. Transforming Fashion Heritage: Building on the Transformative Potential of XR Technologies

Building on the transformative potential of XR technologies to shift users from passive spectators to active participants – as explored in the storification of narratives – the integration of XR and AI in fashion opens similarly radical pathways for reimagining how fashion is experienced, produced, and communicated, both commercially and culturally. Central to this evolution is the use of digital twins within fashion production chains [SVKD24], enabling experiences such as virtual try-ons [KF08]; [HWW*18], AI-driven personalized styling [LGM*23], augmented reality fashion shows [XYS*20], and interactive retail environments [MtDJ18]. These immersive experiences not only reshape consumer engagement but also suggest new avenues for the exhibition and preservation of fashion as cultural heritage. VR, in particular, plays a crucial role in this shift, fostering a form of embodied interaction where garments are not merely seen but experienced – tried on, moved through, and engaged with in spatialized environments [DMMDV18]. Through customizable

avatars and digital wardrobes, users project identities and participate in fashion narratives that blur the boundary between material and digital selfhood [SCN*21]; [LLX*20]; [FM21]. As with immersive cultural storytelling, this transformation invites users to live fashion rather than observe it – turning personal interaction into a site for meaning-making, affective engagement, and even memory production. Fashion, like heritage, becomes a storified experience: lived, embodied, and remembered within the framework of immersive digital media.

For this reason, the following paragraphs will present a series of case studies that are particularly relevant for exploring the current state of the art in the use of XR for fashion exhibitions. These examples will include both commercial applications and heritage preservation projects, to provide an overview that focuses on the technologies employed rather than their specific purposes. The main point they all have in common is the type of interaction enabled: from a static, gaze-based one, to a more dynamic, playful and deeper approach to the (digital) garment. However, before turning to the analysis, it is important to acknowledge the conceptual distinction between heritage storytelling and marketing storytelling, even as the two increasingly blur in fashion display. Heritage storytelling is traditionally concerned with the transmission of cultural memory, identity, and values across generations. It draws on historical narratives, community knowledge, and material culture to preserve and reinterpret the past. Marketing storytelling, by contrast, is oriented toward brand positioning, emotional persuasion, and consumer engagement. It often mobilises heritage selectively, transforming it into symbolic capital for differentiation and loyalty [Mos17] [RGN16]. In XR environments, however, these narrative modes begin to converge. Immersive technologies, thanks to their affordances, can be used simultaneously to evoke historical meaning and to stimulate desire, producing experiences that are sensorially rich, emotionally resonant, and semantically layered. While the contrast between retail contexts and exhibition settings continues to shape the intent, structure, and pacing of immersive experiences, the technological grammar they employ is increasingly shared. This raises an open question: when heritage storytelling and marketing storytelling operate through the same technological infrastructures, can their aims still be meaningfully distinguished? Or do they begin to form a hybrid continuum in which cultural memory and commercial affect become entangled, co-existing within the same sensory and narrative frameworks? Rather than a binary opposition, this convergence suggests a shifting terrain, where the boundaries between preservation and persuasion are continually negotiated through design, interaction, and context.

3. Investigating XR in Fashion Display: Method, Framework, and Case Studies

3.1. Methodology

This study adopts a qualitative, exploratory approach based on a set of case studies selected for their relevance to XR-based fashion storytelling. The selection criteria included: (1) the presence of XR technologies enabling user interaction with garments or narratives; (2) the diversity of contexts, covering both commercial brand initiatives and institutional exhibitions; and (3) the availability of sufficient documentation or firsthand access to the experience. The anal-

ysis focused on how immersive environments construct or enhance narratives related to brand heritage, identity, and cultural memory. Rather than aiming for exhaustiveness, the goal was to identify exemplary and influential practices within an emerging landscape.

3.2. Analytical Framework and Case Selection Criteria

This investigation forms part of a broader research project focused on designing a workflow to explore how digital twins can be integrated into both the production and the communication of fashion. In the framework of this research, this specific paper looks into the way immersive and digital technologies are currently employed in the presentation of garments, selecting case studies that offer meaningful insights into emerging practices. The primary interest lies in what these technologies enable in the present, particularly in terms of how garments are visualised, accessed, and interacted with. The focus is on the evolving dynamics between garment and viewer, and on how these relationships are being reshaped through technological tools. The main aim is to identify exemplary applications that help envision future scenarios for fashion display. For this reason, rather than aiming for an exhaustive mapping of the field, the selected case studies examine a range of initiatives undertaken by fashion brands and institutional museums to make fashion accessible to the public – either as a means of contributing to brand heritage or constructing a narrative around a specific concept. Burrowing from the work in the field of corporate heritage by Riviezzo, it is possible to identify four key categories within these practices: *storytelling*, encompassing the tools and strategies used to engage various stakeholders through the narrative of the brand's history; *branding*, which communicates identity through symbolic and emotional elements derived from corporate heritage to strengthen brand recognition and loyalty; *organizational units*, including corporate museums, archives, and foundations that serve as dedicated spaces for the conservation and dissemination of brand history; and *public relations*, which involve events, merchandising, and commemorative initiatives that celebrate key figures or milestones in a company's past [RGN16]. The above framework is further expanded by Mosca, who identifies specific heritage factors that contribute to constructing a strong narrative identity and fostering interactive and compelling user engagement with the brand's legacy [Mos17]. Among these, it is possible to identify factors on which storytelling is based, which are (1) *the history of the brand*, (2) *key figures behind its success*, (3) *the production techniques of its origins*, (4) *the re-editions of iconic products* and (5) *the exploration of architecturally relevant spaces*. Drawing from the intersection of Riviezzo's categories and Mosca's focus on the narrative components of storytelling, the selected experiences encapsulate one or more of these dimensions. While grounded in the analytical models of Riviezzo et al. and Mosca, this study proposes an expansion of their frameworks into the realm of immersive digital practice. By examining how XR enables storyliving experiences that are sensorially rich and emotionally resonant, the paper contributes a novel perspective on how heritage communication can move beyond linear narration to embodied, participatory environments. This hybrid framework – linking strategic branding categories with narrative interaction design – positions XR not only as a tool of display but as a cultural interface between memory, identity, and innovation.

3.3. Enhancing Fashion Display: XR Technologies and Strategies in Brands' Storytelling

To explore how digital technologies contribute to new modes of fashion display, the chosen case studies exemplify different strategies for engaging audiences through immersive experiences. These examples highlight how digital twins and XR technologies are not only used to replicate physical garments but also to construct narrative environments, facilitate user interaction, and expand the reach of fashion communication across physical and virtual platforms. The selected experiences intersect with the four categories identified by Riviezzo – storytelling, branding, organizational units, and public relations [RGN16] – as well as with the five heritage-based storytelling elements outlined by Mosca: brand history, key figures, production techniques, re-editions of iconic products, and architectural spaces [Mos17].

One of the most emblematic cases is Balenciaga's *Afterworld: The Age of Tomorrow* (2020), which employed virtual reality and volumetric capture to build a fully immersive, game-like environment functioning both as a digital fashion show and a speculative narrative space. The project exemplifies immersive brand storytelling, situating garments within a dystopian yet aesthetically coherent world and aligning with Mosca's notion of using narrative to express brand values. In 2021, Balenciaga extended its engagement with digital culture through a collaboration with Fortnite, integrating 3D-modeled outfits into the gaming platform. This strategic deployment of digital twins for branding and public relations illustrates how XR technologies can be leveraged to reach younger, gaming-oriented audiences and expand brand accessibility through more dynamic, playful interactions with garments.

Similarly, Gucci has explored multiple digital formats to reimagine brand engagement. In 2020, it launched an AR Sneaker Try-On via Snapchat, allowing users to preview virtual sneakers in real-time. This interaction not only encouraged product engagement but also reduced barriers in online shopping through an accessible, gamified experience. In 2021, Gucci recreated its *Gucci Garden* within the Roblox platform – an immersive, interactive environment where users explored symbolic rooms and collected limited-edition digital fashion items. The project drew from the physical Gucci Garden in Florence, a hybrid cultural-commercial site conceived by then-creative director Alessandro Michele, merging store, exhibition, and restaurant within the historic Palazzo della Mercanzia. The Roblox version echoed this hybrid logic, offering an affective, exploratory narrative that reinforced the symbolic and emotional aspects of Gucci's identity, while the virtual tour of the *Gucci Garden* offers a photorealistic replica of the space for remote access, its interaction is limited to guided navigation points, lacking the participatory, open-ended engagement enabled by the Roblox experience. The comparison highlights the shift from linear storytelling to more interactive storydoing and storyliving, where users actively co-construct the brand narrative. These digital activations align with Riviezzo's branding and public relations strategies [RGN16] while drawing on Mosca's focus on brand history and symbolic architectural spaces [Mos17].

Burberry provides another relevant case with its 2020 collaboration with Microsoft and Hevolus, which used Mixed Reality to enable in-store interaction with digital twins of footwear. This enhanced the customer journey by combining product personalisation with

immersive storytelling, bringing craftsmanship to the foreground in a contemporary, digitally augmented retail experience. In a separate initiative, Burberry also created a virtual version of its flagship store in Ginza, Japan, allowing users to browse the space, explore collections in a 3D environment, and book personalised appointments. The experience featured a digital encounter with actress Elaiza Ikeda, combining celebrity culture with retail to reflect Mosca's heritage factor of key figures. These cases embody a hybridisation of organizational spaces and branding, emphasising the symbolic and emotional role of flagship stores while extending their reach through immersive digital environments.

Ferragamo and Louis Vuitton have experimented with XR technologies in ways that reinforce artisanal identity and spatial storytelling. Ferragamo's 2020 in-store MR activation highlighted the brand's renowned *Tramezza* technique by enabling customers to visualise the internal structure of its luxury leather shoes. This intervention made visible the invisible layers of craftsmanship, transforming the act of looking into a tactile, educational experience that echoes Mosca's emphasis on production techniques and aligns with Riviezzo's category of organizational units, turning the flagship store into locations for the spread of the brand's identity and values. Louis Vuitton, on the other hand, employed XR for public-facing exhibitions and large-scale campaigns. Notably, their VR exhibition tours (2020) and city-scale AR activations in collaboration with Yayoi Kusama (2023) demonstrate how immersive media can blur the line between fashion, art, and urban experience, making fashion heritage mobile, interactive, and multisensory. These cases reflect a dynamic approach to public relations, reimagining display through multisensory interfaces that extend brand narratives into public space.

Fendi's Sneaker Hunt (2022) adds a playful dimension to this landscape. Built on AR and gesture-based controls via Spark AR, the gamified experience encouraged users to search for virtual sneakers using hand movements, creating a sense of immediacy and agency. Here, fashion display is reconfigured as a ludic, narrative-driven interaction, demonstrating how even product promotion can adopt immersive storytelling logics.

Taken together, these case studies reflect a diverse and expanding ecosystem of fashion display practices powered by immersive technologies. They show how digital twins are no longer passive representations but active agents in transforming garments into cultural, narrative, and affective interfaces. These initiatives not only reactivate the symbolic value of fashion heritage but also propose new models for making it accessible, playful, and emotionally resonant. While brand-led activations explore the communicative and commercial potential of XR, they also contribute to a broader cultural shift – one in which fashion display becomes a medium for participation, co-creation, and embodied cultural memory. Within this context, the boundary between storytelling and experience collapses, as users increasingly engage with and within the garment, enacting new forms of narrative and value through immersive interaction.

3.4. Enhancing Fashion Display: Immersive Heritage in Institutional Museums

In addition to brand-driven digital activations, several institutional exhibitions demonstrate how immersive technologies are being

used to expand the sensory and experiential dimensions of fashion display within museum contexts. These curatorial projects illustrate a growing interest in redefining the relationship between garments, technology, and audiences – not simply through visual engagement, but through multisensory, narrative-rich environments. These cases also reflect broader curatorial strategies for activating fashion heritage, intersecting with Riviezzo's categories – particularly storytelling and organizational units – as well as Mosca's emphasis on the narrative value of traditional craft's techniques, histories, and the reanimation of iconic pieces.

A significant example of immersive curatorial practice is *Sleeping Beauties: Reawakening Fashion*, an exhibition held at The Metropolitan Museum of Art between May and September 2024, curated by Andrew Bolton, Head Curator of the Costume Institute. The exhibition was conceived as a multisensory circuit, combining a range of technologies – including holography, AI-generated avatars, immersive soundscapes, animated embroidery panels, and olfactory stations activated by scent molecules derived from garments or their botanical references. These elements worked in concert to shift the visitor's role from passive observer to emotionally and sensorially engaged participant. Through techniques such as digital scanning, 3D modelling, and motion capture, the exhibition animated garments from the museum's permanent collection, allowing them to be experienced not only visually but affectively – reactivating their material presence in imaginative and intimate ways. Among the most notable interventions was the "digital resurrection" of a historically significant but physically deteriorated dress, too fragile to be displayed on a mannequin. Through a digital twin animated by the motion of a digital dancer's body, the dress was brought back to life in fluid movement – offering an evocative example of how XR technologies can restore visibility and meaning to garments otherwise excluded from traditional exhibition practices due to preservation limits. This strategy exemplifies how digital tools can expand curatorial possibility, preserving not only the visual form but also the kinetic and emotional resonance of fashion objects. The use of digital twins here is not limited to documentation or simulation; rather, they become narrative agents, enabling audiences to experience garments as living cultural artefacts. *Sleeping Beauties* stands as a compelling example in the recent history of curatorial practice: it illustrates how immersive technologies can foster affective and embodied encounters with fashion heritage, particularly through the reactivation of archival materials that might otherwise remain unseen. Aligned with Mosca's emphasis on symbolic and sensorial storytelling and with Riviezzo's notion of heritage as a vehicle for branding and audience engagement, the exhibition suggests a paradigm shift in fashion curation as a practice: from display as presentation to display as experience. It positions the garment not as an inert object behind glass, but as a multisensory interface that can mediate memory, emotion, and cultural identity through technologically enhanced interaction.

Another case from the same institution that dates way back is *Charles James: Beyond Fashion* (2014), curated by Jan Glier Reeder in collaboration with the design studio Diller Scofidio + Renfro. This project combines the aesthetic experience of *haute couture* with technical analysis, integrating digital animations, robotic arms, and 3D scans to explore the structural architecture of Charles James's garments. X-rays, microscopy, and original technical documentation are used to reconstruct the garments' construc-

tion in motion, making visible the hidden layers of craftsmanship. The garments are not only displayed as finished artefacts but are digitally decomposed and reassembled, transforming the viewing experience into a pedagogical one that reveals the designer's know-how. This curatorial approach aligns closely with Mosca's emphasis on production techniques and heritage-based storytelling, presenting technology as a tool to read through, rather than merely enhance, the fashion object. The interaction with the garment becomes deeper, and digital technologies here allow for types of interaction that otherwise would not be possible.

A third exhibition, *Gabrielle Chanel: Fashion Manifesto* (2024) at the Power Station of Art in Shanghai, focuses on the legacy of Gabrielle Chanel through a chronological and thematic display of her most iconic pieces. While technologically less complex than the previous examples, the exhibition employs projection panels to frame the garments within a historical narrative, making Chanel's design language legible through moving images and interpretive overlays, which created a peculiar atmosphere around the displayed items that absorbed and activated the user as part of the exhibition's staging [Bru22]. These projections help articulate the symbolic and emotional values associated with the brand's heritage, echoing Riviezzo's category of branding through storytelling, while also contributing to the creation of a more immersive and memorable experience for the visitor.

Together, these curatorial experiments demonstrate how digital technologies can deepen both interpretive and emotional engagement in fashion exhibitions. While they differ in complexity and curatorial intent, all three examples show how immersive display strategies – whether through digital reconstructions, animated structures, or sensorial activations – can serve to recontextualize fashion objects, turning them into interactive narrative agents. These cases also highlight how museums, working as organizational units, are increasingly embracing technologies not just for conservation and access, but for constructing embodied and participatory encounters with fashion heritage.

3.5. Comparative Insights: Commercial vs. Museum Immersion

The case studies discussed in the previous sections reveal both convergences and asymmetries in how immersive technologies are deployed across commercial and museum contexts. On the commercial side, brand-led XR experiences typically operate within a marketing logic, aiming to generate affective engagement, reinforce brand identity, and stimulate aspirational desire. This is often achieved through mechanisms of self-identification enabled by customizable avatars, augmented reality try-ons that virtually dress the user, or gamified environments that invite playful interaction with the brand's aesthetic universe. Immersion is strategically crafted to amplify emotional resonance and to produce moments of wonder or enchantment, where garments become symbolic artefacts of lifestyle and identity. These experiences are typically fast-paced, aesthetically polished, and attuned to the attention economy – designed to be shareable, photogenic, and emotionally charged. Institutional applications, by contrast, are usually shaped by pedagogical, curatorial, or preservationist imperatives. XR is used to foster understanding of the material, technical, and symbolic dimensions of fashion objects and to make cultural knowledge ac-

cessible to broader publics. The pacing tends to be slower, more contemplative, and more anchored in contextual explanation. In museum-led scenarios, garments are less often elevated as unreachable icons and more often situated within socio-historical narratives – as expressions of local identity, gender politics, or artisanal knowledge. Immersion here functions not only as a sensory tool but as a means of cultural translation and engagement. Nevertheless, both domains increasingly rely on similar technological affordances – from photogrammetry and spatial computing to volumetric video and technology-based narrations. This convergence signals that immersive fashion display is not reducible to its host but circulates across cultural and commercial spheres. The same interface design principles, narrative structures, and sensory cues are repurposed across retail pop-up experiences and museum installations alike, suggesting that XR constitutes a shared language of storytelling, even if the institutional aims diverge. This overlap raises critical questions about authorship, access, and authority. Who gets to tell the story of a garment – the brand that markets it, or the museum that preserves it? How is fashion heritage constructed, and by whom? As both sectors adopt immersive strategies, the line between marketing and heritage storytelling becomes increasingly blurred. This hybridisation may foster creative experimentation, but it also demands critical scrutiny: to ensure that cultural narratives are not flattened into consumable spectacles, and that immersive engagement serves not only emotional activation but also reflexive understanding.

4. Fashion Display Futures: Speculative Scenarios towards Phygital Imaginings

Drawing on the case studies analysed, it is now relevant to consider how digital and immersive technologies may not only support but potentially transform the ways fashion is displayed, communicated, and remembered. Within this framework, speculating about future case scenarios is not a projection into distant timelines, but a conceptual tool for interrogating present technological affordances and imagining their potential evolution in shaping fashion narratives. In the following paragraphs, three case scenarios for fashion displays open the way towards very technologically advanced futures where material and digital matters come together, intertwining tangible and intangible threads into a phygital reality.

The first scenario might involve the development of interactive memory garments, where digital twins operate not merely as static representations but as responsive entities capable of activating multisensory content – visuals, sounds, scents – linked to the material history, affective traces, or socio-cultural contexts of a piece. These garments could generate encounters rooted in storyliving, rather than passive storytelling, by integrating smell, movement, and spatialized sound into the viewing experience. Such possibilities resonate with current curatorial experiments like *Sleeping Beauties* at the MET but dematerialise it even further, prospecting scenarios where the display is based on digital replica which enables dynamic and engaging interactions. In addition, this scenario can be envisioned both in institutional spaces made available through a series of MR headsets but also in digital platforms with the creation of virtual exhibitions. For example, the construction of a virtual exhibition could widen the domain of organizational units, improving the accessibility of the exhibition for people who cannot visit it in

person. In addition, building on the notion of storyliving and on the importance of the creation of a personal narrative for the effective communication of heritage, such platforms could also provide forms of participation for the users – like inviting them to share their personal stories about displayed garments – increasing access to heritage and allowing users not only to view but also to curate, remix, and share archival content, effectively transforming the archive from a closed institutional repository into a living, co-authored cultural resource. These platforms could include tools for generating spatial narratives around garments, connected to the history and anecdotes of the garment – where users, designers, and historians co-construct contextual frames that might otherwise be lost or hidden. In this model, the digital twin becomes a node in a network of evolving meanings, enriched by public interaction and collective storytelling. This aligns with the branding and public relations dimensions in the adopted methodological framework, where brand identity is shaped not solely through formal campaigns but through participatory acts of memory and cultural dialogue.

The second scenario sees the integration of generative AI into fashion storytelling. This represents another trajectory wherein machine learning systems trained on archival data, interviews, sketches, and design histories could generate bespoke narratives for users. These AI systems might respond to a user's movements, preferences, or spoken queries, crafting dynamic micro-histories of garments, giving hints on their provenance, or narrating their imagined trajectories. Such a system would not only enrich the display experience but further dissolve the boundaries between storytelling, design, and affective engagement, situating the viewer as both recipient and co-author. This idea resonates with Mosca's focus on the emotional and symbolic power of fashion narratives, and with contemporary shifts toward more immersive and affective forms of cultural consumption. This function could also be integrated into the first scenario, by adding a collaborative AI that helps the user to create their narrative on the garment or on the brand, supporting them do research on the topic and basing it on archival multimodal materials.

The third scenario takes place in several different contexts, where context-aware AR installations could bring fashion displays out of traditional venues and into everyday life. Using geolocation, weather data, or time-of-day triggers, garments or brand histories might be made to appear in a variety of city spaces, enabling an ambient form of narrative that blurs the line between advertising, cultural memory, and artistic practices. This points toward a transformation of public relations into something more spatially and sensorily embedded, engaging passers-by not as consumers but as situated participants in a diffuse, experiential archive. Further, the potential for craftsmanship-as-performance in mixed reality offers exciting ways to reframe fashion heritage as a practice, rather than a fixed set of objects. In this speculative scenario, users could engage directly with virtual artisans or step into simulated design environments where historical techniques – pattern cutting, draping, embroidery – are animated and manipulable. This would not only preserve artisanal knowledge but render it accessible as an experiential learning tool, bridging branding and storytelling by demonstrating how a brand's identity is tied to tactile, material processes. Together, these three speculative scenarios offer more than creative provocations – they help frame the future of fashion display as an ecosystem of interaction, where garments operate as narrative inter-

faces and archives become performative environments. They point toward a convergence between fashion, technology, and cultural memory, in which digital tools do not merely replicate existing heritage but enable new kinds of presence, participation, and practices of meaning-making. For this reason, imagining future use cases becomes an essential component of understanding how digital twins and immersive technologies can shape not only what we preserve, but how we remember, experience, and co-create the cultural significance of fashion.

5. Discussion and Conclusion

This paper departed from a central question: what can technology do in the realm of fashion display? By focusing on the affordances of XR technologies – whose immersive, interactive, and multisensory qualities allow users to experience garments in dynamic, interactive and emotionally engaging ways – the research has examined how fashion is exhibited and reimagined through digital means. Through an analysis of cases from both commercial and museological contexts, the study has explored two domains that, while differing in function, intent, and target audiences, increasingly converge in their technological strategies. This dual focus was not incidental: fashion must be understood as a complex cultural and social practice, one that circulates between institutions, industries, and the public. Even though it is true that technologies should not be treated as neutral tools but as mediators of meaning according to their contexts of use, it is also clear that display technologies used in commercial and museological contexts of the fashion field are the same, especially in a moment when designers and researchers are still experimenting how to embed XR technologies in the cultural field. However, the connection between commercial and museological contexts has emerged in previous studies. In a previous benchmark analysis, it has been shown that virtual retail environments emulate museum aesthetics and cultural institutions borrow from branding and experiential marketing, revealing how both sectors are engaging in storytelling practices that aim to activate heritage, memory, and identity through digital instruments [HCS*24]. In *Fashion, History, Museums*, Julia Petrov observes that displays in both commercial and museological settings have long shaped the ways we look at and understand fashion [Pet19]. Specifically, Petrov builds on Tony Bennett's notion of the *exhibitionary complex* [Ben19], showing how nineteenth-century museums and department stores developed in parallel, borrowing architectural forms, display techniques, and modes of spectatorship. It is at that moment that the act of looking – whether in the context of consumption or at the museum – became central to the acquisition of both goods and knowledge. As Mackie aptly noted, “both the retail shop and the public repository are designed for the display of information that is predominantly visual: looking is a means for possession as well as knowledge” [Mac96]. This legacy continues to inform today's immersive fashion environments, where the boundaries between shopping and curating, entertainment and culture, remain porous. It is precisely because fashion occupies an ambiguous position between economy and culture, commerce and history, that its digital display – especially through XR – can generate new forms of cultural knowledge and engagement. Despite the differences in educational scope or economic capital – whether the main aim is to attract consumers or impress spectators – the technologies em-

ployed are often the same. Digital twins, XR environments, and multisensory interfaces have become central to researchers in both heritage marketing and exhibition design, enabling new levels of narrative interactivity. As already addressed, these practices can be framed through Riviezzo's corporate heritage model – highlighting branding, storytelling, organizational legacy, and public engagement [RGN16] – as well as Mosca's emphasis on the strategic use of history, iconic products, artisanal know-how, and architectural heritage [Mos17]. In this light, fashion display emerges as a cross-disciplinary platform for the reactivation of brand identity and collective memory. Already, the current landscape suggests a shift toward co-participated, affect-driven experiences, where audiences become users who actively navigate and interpret digital garments, archives, and environments. Looking forward, the integration of generative AI and machine learning points toward adaptive and personalised heritage narratives, opening new forms of accessibility and inclusion. While this paper traverses a wide spectrum of modalities through which users may engage with fashion heritage – from observation to immersion, from interpretation to enactment – it does not incorporate empirical data drawn from users, curators, or sector professionals. Direct insight into how individuals actually perceive and experience the shift from storytelling to storyliving would have further strengthened the argument and added a critical dimension of situated perspective to the analysis. This limitation is acknowledged, and it reflects the current study's theoretical and case-driven scope. However, this paper forms part of a broader research trajectory that includes a forthcoming practice-based component introduced earlier in this text. That ongoing project will engage directly with cultural stakeholders, with a particular focus on the preservation and activation of handcrafted fashion heritage within a specific regional context. Through participatory methods and situated experimentation, it will examine how immersive technologies mediate cultural value, identity, and memory in real-world settings. The insights generated from the future hands-on phase will serve to enrich, nuance, and critically expand the conceptual framework outlined here.

Another aspect that needs to be addressed is the complexities brought about by the incrementation in the use of XR technologies and AI in fashion display. Despite the exciting potential of immersive technologies, their implementation in fashion heritage contexts introduces significant limitations and ethical concerns on their sustainability. First, the financial and technical barriers to developing high-quality XR experiences – including volumetric capture, custom interfaces, and multisensory installations – often exclude small-scale brands, independent designers, and underfunded cultural institutions. This risks reinforcing existing inequalities in cultural production and access, making digital innovation a privilege of the few rather than a tool for broader inclusion. Second, the ephemeral nature of immersive media – shaped by rapidly evolving platforms, proprietary software, and hardware obsolescence – raises serious concerns about the long-term sustainability and archival viability of XR-based heritage projects. Without robust digital preservation strategies, today's immersive displays may become tomorrow's lost experiences. Third, the emphasis on interactivity and emotional impact can, if not critically managed, lead to a form of aesthetic overdetermination, where spectacle overrides reflection. Sensory-rich environments may seduce users into passive awe, flattening garments into surface effects and detaching

them from their historical, social, or political significance. Fourth, immersive displays involving data capture, AI narration, or user-generated content introduce new challenges around authorship, authenticity, and data governance. When public heritage is embedded in proprietary or corporate systems, questions arise about who owns the narrative, who shapes it, and who is left out. Finally, the environmental cost of digital infrastructures is often ignored in the celebration of technological innovation. XR systems require energy-intensive computation, continuous data streaming, and frequent hardware upgrades, all of which contribute to e-waste and carbon emissions. The materiality of the digital – its servers, headsets, sensors, and screens – must be critically accounted for in any discussion of sustainable heritage practices. Without this reckoning, immersive storytelling risks becoming not only economically and socially exclusive but also ecologically unsustainable. Reflecting on the three speculative scenarios presented earlier – the AI-based co-creation model, the multisensory heritage co-creation experience and the urban diffused AR application – each carries not only transformative potential but also distinctive sustainability challenges. The AI-driven narrative system raises questions about data ethics, content authenticity, and algorithmic bias; the multisensory experience, while potentially inclusive, relies on resource-intensive hardware and demands continuous technical upkeep; the urban diffused AR application may foster new forms of cultural participation, but risks commercial instrumentalisation of heritage. From an environmental standpoint, all three involve significant energy use and material infrastructures that complicate their ecological footprint. From an institutional perspective, their feasibility depends on long-term funding, cross-sector collaboration, and access to digital literacy. These scenarios should therefore be understood not as utopian blueprints but as critical probes: tools for thinking through how immersive storytelling can evolve responsibly, balancing innovation with equity, care, and sustainability in all its dimensions. For this reason, it is crucial to recognise that the limitations identified throughout this paper do not undermine the cultural value of XR fashion heritage. Rather, they underscore the urgency of developing frameworks that are ethically grounded, critically reflective, and environmentally conscious. Innovation in immersive heritage must be pursued with a deep awareness of material consequences, a commitment to social inclusion, and a clear sense of institutional responsibility. These technologies should not merely dazzle or disrupt; they should serve broader cultural and civic aspirations. Fashion, after all, does not exist *in a vacuum*. It is woven into the textures of everyday life, shaped by histories of labour, identity, and resistance, and sustained through both material craft and immaterial meaning. The technologies used to exhibit and mediate fashion must therefore be situated within that same continuum – attuned to its contradictions, responsive to its multiplicities, and accountable in their vision for its future.

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